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Docket No. 20190140-EI
Comprehensive Exhibit List for Entry into Hearing Record
July 7-9, 2020

EXH #	Witness	I.D. # As Filed	Exhibit Description	Issue Nos.	Entered
STAFF					
1		Exhibit List	Comprehensive Exhibit List		
DUKE ENERGY FLORIDA – DIRECT					
2	Terry Hobbs	TH-1	Decommissioning Services Agreement between DEF, ADPCR3, and ADPSF1. **CONFIDENTIAL DN. 05439-2019**	1-8	
3	Terry Hobbs	TH-2	DEF's Updated Nuclear Decommissioning Study.	1-8	
4	Scott E. State	SS-1	NorthStar Projects.	1	
5	Scott E. State	SS-2	Orano Projects.	1	
6	Matthew Palasek	MP-1	Request for Information.	1	
7	Matthew Palasek	MP-2	RFP Bid Instructions and RFP Project Scope.	1	
8	Matthew Palasek	MP-3	Bid Evaluation Process Framework.	1	
OFFICE OF PUBLIC COUNSEL – DIRECT					
9	Richard A. Polich	RAP-1	Resume of Richard A. Polich, P.E.	1,7,8	
10	Richard A. Polich	RAP-2	List of Richard A. Polich Testimony.	1,7,8	

11	Richard A. Polich	RAP-3	Advanced Decommissioning Partners Organization.	1,7,8	
12	Richard A. Polich	RAP-4	DEF Response to Citizens Interrogatory 5.a. **CONFIDENTIAL DN. 03171-2020**	1,7,8	
13	Richard A. Polich	RAP-5	DEF Response to Citizens Interrogatory 5.e. **CONFIDENTIAL DN. 03171-2020**	1,7,8	
14	Richard A. Polich	RAP-6	NorthStar Group Holdings, LLC and NorthStar Group Services, Inc. Financial Statements. **CONFIDENTIAL DN. 03171-2020**	1,7,8	
15	Richard A. Polich	RAP-7	DEF Response to Citizens Interrogatory 16. **CONFIDENTIAL DN. 03171-2020**	1,7,8	
16	Richard A. Polich	RAP-8	NorthStar Financial Hardship Accessible Assets. **CONFIDENTIAL DN. 03171-2020**	1,7,8	
17	Richard A. Polich	RAP-9	Comparison of Contract Provision Trust Funding.	1,7,8	**Not Entered**
DUKE ENERGY FLORIDA – REBUTTAL					
18	Jeff Adix	JA-1	Jeff Adix' Resume.	1	
19	Jeff Adix	JA-2	Excerpts from Mr. Polich's Deposition. **CONFIDENTIAL DN. 03179-2020**	1	
STAFF HEARING EXHIBITS					
20	Terry Hobbs		DEF's Reponses to Staff's Second Set of Interrogatories Nos. 8-16. **Additional files contained on Staff Hearing Exhibits CD for Nos. 6-16.** *[Bates Nos. 00001-00012]*	1,7	

21	Terry Hobbs		DEF's Responses to Staff's Third Set of Interrogatories Nos. 17-20. **19 & 20 – Confidential DN. 10958-2019** *[Bates Nos. 00013-00017]*	1	
22	Terry Hobbs (21-30, 33-36, 38A-C) David L. Doss (31, 32, 37, 39, 40)		DEF's Responses to Staff's Fourth Set of Interrogatories Nos. 21-37, 38A-C, 39, and 40. *[Bates Nos. 00018-00038]*	1-5, 7	
23	Terry Hobbs		DEF's Responses to Staff's Fifth Set of Interrogatories, Nos. 42, 44, 48-49, 51, and 52. Including Supplemental Responses. *[Bates Nos. 00039-00070]*	3	
24	Terry Hobbs		DEF's Responses to Staff's Sixth Set of Interrogatories Nos. 54-56. *[Bates Nos. 00071-00081]*	1, 3	
25	Terry Hobbs		DEF Responses to Staff's Seventh Set of Interrogatories Nos. 57-60, and 62. **58 – Confidential DN. 01316-2020** *[Bates Nos. 00082-00091]*	3	
26	Terry Hobbs		DEF's Responses to Staff's Ninth Set of Interrogatories Nos. 67-72. *[Bates Nos. 00092-00101]*	1, 4, 6, 7	
27	Terry Hobbs		DEF's Responses to Staff's Tenth Set of Interrogatories Nos. 77 and 81. *[Bates Nos. 00102-00105]*	1, 3	
28	Terry Hobbs		DEF's Responses to Staff's Eleventh Set of Interrogatories Nos. 82, 83, and 84. *[Bates Nos. 00106-00114]*	1, 3	

29	Terry Hobbs		DEF's Response to Staff's First Set of Production of Documents No. 2. Including 1st & 2nd Supplemental Responses. **Additional files contained on Staff Hearing Exhibits CD for No. 2.** *[Bates Nos. 00115-00151]*	1,7	
30	Terry Hobbs		DEF's Response to Staff's Third Set of Production of Documents No. 15. *[Bates Nos. 00152-00158]*	1	
31	Terry Hobbs		DEF's Response to Staff's Fourth Set of Production of Documents No. 16. *[Bates Nos. 00159-00160]*	1, 3	
32	Terry Hobbs		DEF's Responses to Staff's Eighth Set of Production of Documents Nos. 25-26. **26 – Confidential DN. 03445-2020** *[Bates Nos. 00161-00173]*	1	
33	Terry Hobbs		Updated Site-Specific Decommissioning Cost Estimate for the Crystal River Unit 3 Nuclear Generating Plant, filed on September 10, 2018. DN. 05915-2018 *[Bates Nos. 00174-00281]*	1	

HEARING EXHIBITS

Live Exhibit Number	Witness	Party	Description		Moved In/Due Date of Late Filed
34	Scott E. State	OPC	NRC Application Attachments		
35	Scott E. State	OPC	Confidential DSA - **CONFIDENTIAL DN. 03533-2020**		

36	Scott E. State	OPC	NEPR Article		
37	Scott E. State	OPC	Investors See Huge Profits		
38	Scott E. State	OPC	Vermont Order 8880		
39	Scott E. State	OPC	TRC White Paper - **CONFIDENTIAL DN. 03533-2020**		
40	Scott E. State	OPC	NRC Amendment to Operating License		
41	David L. Doss	OPC	Hobbs LFDE		
42	David L. Doss	OPC	TRC PowerPoint 3.19.2019 - **CONFIDENTIAL DN. 03533-2020**		

CONFIDENTIAL

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 2
PARTY: DUKE ENERGY FLORIDA – DIRECT
DESCRIPTION: Terry Hobbs TH-1

DUKE ENERGY FLORIDA

2019 ACCELERATED NUCLEAR DECOMMISSIONING COST STUDY

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1. 2019 Accelerated Nuclear Decommissioning Study Summary
2. Determination of Annual Accrual for Decommissioning
3. Inflation Rate and Assumed Fund Earnings Rate
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FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 3
PARTY: DUKE ENERGY FLORIDA – DIRECT
DESCRIPTION: Terry Hobbs TH-2

Introduction

This site-specific decommissioning cost analysis (study) was prepared by Duke Energy Florida (DEF) to comply with the purpose and requirements of Rule 25-6.04365, Florida Administrative Code. This study demonstrates there are sufficient funds on hand at this time to meet all required expenses of the recently announced contractual agreement between DEF and Accelerated Decommissioning Partners (ADP) to decommission Crystal River Unit 3 (CR3) through license termination. This study also highlights the contractor and owner cost to reach license termination. The conclusion of this study is that, at this time, the current Nuclear Decommissioning Trust Fund (NDT) is sufficient to fund all required expenses and that there will be excess funds in the NDT to address emergent issues or be available at license termination. Because of the new development of the signed fixed price contract between DEF and ADP and the provisions it contains, some specific elements contained in subsections (3) and (4) of the Rule 25-6.04365 do not apply to this study and as such are not presented.

Accelerated Decommissioning Cost Summary

DEF has entered into a Decommissioning Services Agreement (DSA) with ADP which provides that ADP will assume the role of operator licensee, responsible for all activities conducted under the License upon NRC approval of the transfers to ADP. ADP has agreed that it will decommission the CR3 Facility under the terms of the DSA, and ultimately obtain termination of the License, pursuant to the fixed price services arrangement. The fixed price of $540 million, and earnings thereon, are placed in a segregated account being created in the NDT. This NDT account will be used to decommission the CR3 Facility, other than the Independent Spent Fuel Storage Installation (ISFSI), and to achieve partial license termination on an accelerated schedule as compared to SAFSTOR.

Separately, ADP has agreed to purchase the spent nuclear fuel and the ISFSI for a nominal amount. ADP will be responsible for all spent fuel management and associated costs after approval of the license transfer by the NRC, and the decommissioning of the ISFSI.

This study estimates the cost of decommissioning based upon the firm fixed price contract with ADP of $540 million, and ongoing DEF management costs of $77 million through decommissioning, for a total cost of $617 million. As discussed later, this decommissioning cost study does not include projected spent fuel management costs due to the sale of the spent fuel and ISFSI to ADP.

The decommissioning activities performed by ADP under the fixed price contract are segregated in three (3) phases and periods:

Phase	Years	Cost $ (000s)	% of Total
Planning / Site Preparation	2020 - 2021	100,695	18.6%
Decommissioning / Partial License Termination	2021 - 2027	403,241	74.7%
Site Restoration	2026 - 2027	36,064	6.7%
Spent Fuel Management / Final License Termination / ISFSI Decommissioning	2027 – 2038	0	0
	Total	540,000	100%

The estimated DEF costs include spent fuel management through the closing date, and license termination costs until the accelerated decommissioning process is complete.

	Cost $ (000s)
DEF Operating Costs up to closing (2020)	44,000
DEF Operating Costs closing through 2022	4,000
DEF Operating Costs 2023-2038	29,000
Total DEF Cost	**77,000**

DEF post-closing operating costs include oversight and pay item validation, non-labor recurring costs, taxes, fees, and insurance costs.

This current cost study reflects significant changes from the last updated cost estimate completed in 2018 and filed for informational purposes on September 10, 2018 (“2018 estimate”) and the 2014 study approved by the Florida Public Service Commission (FPSC) on December 22, 2014 (Order No. PSC-14-0702-PAA-EI) as a result of DEF’s decision to accelerate decommissioning activities by moving from the SAFSTOR method to the DECON method.

The Nuclear Regulatory Commission (NRC) has defined three acceptable decommissioning methods: Prompt Removal/Dismantling (DECON); Safe Storage / Deferred Decontamination (SAFSTOR); and Entombment (ENTOMB). This study incorporates costs included in the definition of decommissioning by the NRC, as well as activities associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. The

ENTOMB alternative is not considered practical for commercial reactors that generate significant amounts of long- lived radioactive material due to the 60-year restriction.

CR3 is on track to reach SAFSTOR dormancy by August 2019 with:

- All fuel in dry storage (ISFSI)
- Spent fuel pool cleaned and empty
- Plant systems decommissioned
- Large components and low-level waste shipped off site
- License conditions modified to align with SAFSTOR conditions

In parallel with work to reach dormancy, DEF explored the feasibility of accelerating decommissioning (DECON method). Based on the comparison between the DECON and SAFSTOR alternatives, DEF selected the DECON method. This is a change from the method last approved by the FPSC in Order No. PSC-14-0702-PAA-EI and with the 2018 estimate.

DECON was selected based on an analysis of various factors, including: the cost of each decommissioning alternative with recent changes in the decommissioning market; the work completed to place the plant in SAFSTOR condition; the duration and amount of fund earnings growth; the availability of low-level waste disposal facilities; the elimination of the risk associated with buildings lying dormant; and the cost certainty provided by the transaction structure.

The analysis shows that the total cost to decommission under DECON is $617M, which is $278.9M lower than the cost under the 2018 SAFSTOR estimate of $895.9M. Note however, that this analysis is not a direct comparison as the decommissioning in the 2018 SAFSTOR estimate was assumed to take place from 2018 through 2074 versus the current DECON study, which has decommissioning occurring from 2020 through 2038. Costs to reach SAFSTOR dormancy (previous spend) from the 2018 estimate are excluded from this study. The DECON alternative, based upon the contract structure with ADP, does not include spent fuel management costs. Additionally, the contract with ADP is a different contracting model that significantly reduces utility staff requirements/DEF management costs, as well as transfers responsibility for emergent issues and related costs to ADP. Note that ADP expects to recover their spent fuel management costs from the DOE.

Due to the change in methodology and contracting model selected and significant change in the timing and duration of decommissioning, a comparison of each cost element is not relevant. As such, DEF did not prepare a Comparison Report for the current study versus the 2018 estimate.

Summary of Estimated Accelerated Decommissioning Costs and NDT Balance

	$ millions
NDT Value (as of 3/31/19)	$654
Estimated NDT Earnings up to closing	$31
ADP Cost (Not to exceed)	($540)
Duke Operating Costs up to closing	($44)
Unallocated NDT Funds at Closing	**$101**
Pending Potential DOE Recovery realized in 2022	$90
Estimated NDT Earnings through 2022	$9
Duke Operating Costs through 2022	($4)
2022 NDT Balance	**$196**
Estimated NDT Earnings 2023-2038	$120
Duke Operating Costs 2023-2038	($29)
2038 NDT Balance (Project Complete)*	**$287**

* Retail portion of unused funds would be returned to customers when spent fuel is no longer at CR3 site and the ISFSI has been fully decommissioned.

Spent Nuclear Fuel Management Costs

The Department of Energy's delay in acceptance of spent nuclear fuel has impacted the overall cost of decommissioning including, in part, costs for staffing to monitor the fuel during storage prior to DOE acceptance of the fuel.

The current study reflects significant changes from the 2018 estimate as a result of DEF's decision to accelerate decommissioning of CR3. ADP has entered into an agreement with DEF to purchase the spent nuclear fuel and Independent Spent Fuel Storage Installation (ISFSI). Any spent fuel management costs prior to closing are the responsibility of DEF; all post-closing spent fuel management costs will be the responsibility of ADP and are not included in the fixed price decommissioning contract. ADP also is responsible for ISFSI license termination and decommissioning costs after the spent fuel is removed. ADP intends to recover a substantial portion of these costs from the DOE due to the DOE's delay in acceptance of spent nuclear fuel. ADP will have access to funds provided by its parent companies to pay for such costs pending ADP recovery of those costs from the DOE.

Assumed Escalation Rate and Fund Earnings Rate

The only costs funded from the NDT subject to a cost escalation rate are the DEF owner's costs for oversight/administration of the contract. The cost escalation rate used for DEF costs is the same as used in the 2018 estimate of 2.64%. The ADP decommissioning contract is a fixed

value in 2018 dollars. Any cost escalation for decommissioning is the responsibility of ADP and are expected to be funded by earnings from the NDT subaccount set aside for the ADP contract.

Although DEF retains ownership and sole access to the NDT, ADP has accepted responsibility for NDT performance of the funds placed in the designated decommissioning subaccount (for the contract value) and has requested that DEF "de-risk" or lower the risk profile for the subaccount by investing in treasury securities. DEF has reviewed the assumptions used by ADP and find them adequate to provide financial assurance that decommissioning services can be performed for the fixed value of the contract.

In May 2019, DEF implemented a hedging strategy that protects the NDT from downside market risk. This "zero cost collar" strategy ensures that the NDT value will not be less than estimated decommissioning costs plus a minimum $25 million contingency.

Financial Assurance and NDT Protections

In the event the project costs are higher than currently estimated by ADP, the transaction has been structured to provide significant protections and financial assurances that ADP can meet its contractual obligations without requiring additional funds to be distributed from the NDT. NorthStar and Orano, the parent companies of ADP, will provide payment and performance guarantees of all obligations of ADP. Additionally, each subcontractor will be required to secure a performance bond for applicable scopes of work.

ADP will also create a $50 million trust fund to support their obligations. The trust will be initially funded with $20 million cash. Subsequently, 6% of each ADP milestone payment from the NDT will be retained in the trust until the trust fund reaches $50 million. Further, WCS will issue a waste disposal credit in the amount of $30 million for future radioactive waste disposal, which credit amount will gradually decrease as the trust fund grows to $50 million. The $50 million trust fund will not be released to ADP until the accelerated decommissioning of the plant is complete (with the CR3 Facility becoming an ISFSI-only site).

The ANI insurance policy, which provides coverage for any offsite radiological event, including transportation of radiological material, will remain in effect with DEF continuing as an insured party under the policy. DEF will also fund ADP for the purchase of environmental accident insurance in the amount of approximately $30 million to protect against previously unknown non-radiological contamination at the CR3 Facility.

Pursuant to the agreement, ADP will accept liability for all on-site environmental liabilities, both radiological and non-radiological.

DEF will have contractual remedies if ADP is unable to complete decommissioning per the terms of the agreement. If an ADP event of default occurs, such as bankruptcy or failure to perform its obligations of the contract, DEF will be able to either take over the membership interests of ADP or assign them to another contractor (subject to NRC License transfer approval) (step-in rights).

Significant NDT protection is provided by the contractual requirement for ADP to provide a disbursement certificate tied to a pay item table for the work performed, and shall include a certificate attesting that ADP has completed the stated percentages of each of the Pay Items included in the disbursement certificate, and accompanied by reasonable supporting documentation to permit DEF to verify the stated percentage completion. This means that DEF will only pay the agreed upon amount for work that has been performed. DEF will hold the earnings in the NDT subaccount designated for the ADP contract until the project is completed.

These protections, assurances, and escrow accounts, all of which protect the NDT from liability in excess of the fixed cost contract price.

In the unlikely event that there are unforeseen circumstances which could not be resolved by any of the foregoing remedies and which would require additional funding, excess NDT funds will continue to remain available to complete the project. Additionally, to address an extreme event, DEF would always have the option to return to SAFSTOR, which would provide additional time for the NDT funds to grow to provide sufficient funding to complete the project. Alternatively, DEF could seek additional funding from customers and shareholders. Based on current information, DEF does not foresee the need to collect such additional funding

Conclusion

As of March 26, 2019, the NDT had a balance net of estimated taxes of $654 million. The cost of the project is expected to total $617 million, consisting of the fixed price for ADP costs of $540 million plus approximately $77 million in owner's costs for DEF. Additionally, DEF projects recovery from the DOE for spent fuel management costs of approximately $90 million in 2022.

NDT reserve funding is estimated to be approximately: $100 million at closing; $196 million after DOE funds are recovered; and close to $280 million when spent fuel is removed and final decommissioning is complete.

This transaction is in the best interest of DEF customers. The NDT is adequate to fund the transaction and provides reserves to address potential issues. No further funding is needed to satisfy the future cost of decommissioning as presented in this study.

DEF 2019 ACCELERATED NUCLEAR DECOMMISSIONING COST STUDY

Section 2 – Determination of Annual Accrual for Decommissioning Page 1 of 2

	ADP Cost	DEF Owner Cost (2018 Dollars)				DEF Owner Cost (Escalated)				NDT Balance (DEF Reserve Subacount)
	License Termination / Site Restoration (escalated)	License Termination	Spent Fuel Management	Site Restoration	Total	License Termination	Spent Fuel Management	Site Restoration	Total	Qualified and Non-Qualified
2019	$ -	$ 17,924	$ 10,321	$ -	$ 28,245	$ 18,398	$ 10,560	$ -	$ 28,958	$ 699,493
2020	$ 540,000	$ 11,190	$ 3,234	$ -	$ 14,424	$ 11,789	$ 3,407	$ -	$ 15,196	$ 104,761
2021	$ -	$ 1,823	$ -	$ -	$ 1,823	$ 1,971	$ -	$ -	$ 1,971	$ 106,965
2022	$ -	$ 1,823	$ -	$ -	$ 1,823	$ 2,023	$ -	$ -	$ 2,023	$ 200,091
2023	$ -	$ 1,823	$ -	$ -	$ 1,823	$ 2,076	$ -	$ -	$ 2,076	$ 204,165
2024	$ -	$ 1,823	$ -	$ -	$ 1,823	$ 2,131	$ -	$ -	$ 2,131	$ 208,358
2025	$ -	$ 1,823	$ -	$ -	$ 1,823	$ 2,187	$ -	$ -	$ 2,187	$ 212,675
2026	$ -	$ 1,823	$ -	$ -	$ 1,823	$ 2,245	$ -	$ -	$ 2,245	$ 217,122
2027	$ -	$ 1,194	$ -	$ -	$ 1,194	$ 1,510	$ -	$ -	$ 1,510	$ 222,498
2028	$ -	$ 1,194	$ -	$ -	$ 1,194	$ 1,550	$ -	$ -	$ 1,550	$ 228,050
2029	$ -	$ 1,194	$ -	$ -	$ 1,194	$ 1,591	$ -	$ -	$ 1,591	$ 233,785
2030	$ -	$ 1,194	$ -	$ -	$ 1,194	$ 1,633	$ -	$ -	$ 1,633	$ 239,102
2031	$ -	$ 1,194	$ -	$ -	$ 1,194	$ 1,676	$ -	$ -	$ 1,676	$ 245,577
2032	$ -	$ 1,194	$ -	$ -	$ 1,194	$ 1,721	$ -	$ -	$ 1,721	$ 252,288
2033	$ -	$ 1,195	$ -	$ -	$ 1,195	$ 1,766	$ -	$ -	$ 1,766	$ 259,245
2034	$ -	$ 1,195	$ -	$ -	$ 1,195	$ 1,813	$ -	$ -	$ 1,813	$ 266,458
2035	$ -	$ 1,195	$ -	$ -	$ 1,195	$ 1,860	$ -	$ -	$ 1,860	$ 273,939
2036	$ -	$ 1,195	$ -	$ -	$ 1,195	$ 1,910	$ -	$ -	$ 1,910	$ 281,700
2037	$ -	$ 1,195	$ -	$ -	$ 1,195	$ 1,960	$ -	$ -	$ 1,960	$ 289,752
2038	$ -	$ 990	$ -	$ -	$ 990	$ 1,667	$ -	$ -	$ 1,667	$ 298,452
	$ 540,000	$ 54,181	$ 13,555	$ -	$ 67,736	$ 63,477	$ 13,967	$ -	$ 77,444	

DEF 2019 ACCELERATED NUCLEAR DECOMMISSIONING COST STUDY

Section 3 – Inflation Rate and Assumed Fund Earnings Rate

Assumed earnings rate for the unallocated portion of the NDT (DEF reserve) is:

Fund	Rate of Return
Pre-Tax, Risked Qualified Fund	5.39%
Pre-Tax, De-Risked Qualified Fund	2.45%
After-Tax, De-Risked Non-Qualified Fund	1.86%

DEF 2019 ACCELERATED NUCLEAR DECOMMISSIONING COST STUDY

Section 4 – Historical Fund Returns

Annualized returns for the periods ended 3/31/19

		Years			
	QTR/YTD	One	Three	Five	Ten
Nuc Decom Trust Fund*					
Before Tax Total Fund	9.2	5.6	7.2	5.9	10.1
After Tax Total Fund	9.0	5.0	6.7	4.5	9.2
Indices					
CPI	1.9	2.1	2.2	1.3	1.7
S&P 500	13.6	9.5	13.5	10.9	15.9
Barclays Aggregate	2.9	4.5	2.0	2.7	3.8

* Fund returns are net of Investment management fees

NorthStar Projects

1. **University of Illinois - Nuclear Reactor Lab (completed August 2012)**: NorthStar dismantled, removed, and packaged the reactor, systems, and structures and decontaminated and removed radiologically contaminated surfaces, components, and debris from the Mark II TRIGA reactor and nuclear reactor lab. The project was completed within the approved budget, without any NOVs from any governmental authority, and without any OSHA recordable incidents.

2. **DOE Hanford - Disposition of 308-A / 309 Reactors & 340 Waste Vault (completed April 2013)**: NorthStar decommissioned two nuclear reactors and a radioactive waste vault. In addition, NorthStar remediated and packaged approximately 200,000 tons of contaminated soil and other materials for disposal. The project was completed within the approved budget, without any NOVs, and without any OSHA recordable incidents.

3. **DOE Savannah River Site – K Cooling Tower (completed September 2010)**: NorthStar performed decommissioning work on a 455-foot-tall and 333-foot-wide heavily-reinforced hyperbolic concrete cooling tower and also performed site restoration work. The project was completed one month ahead of schedule, under budget, without any NOVs, and without any OSHA recordable incidents.

4. **University at Buffalo – Materials Research Center (completed December 2013)**: NorthStar performed decommissioning and site restoration work at this nuclear research and test reactor. The project included removal, packaging, and disposal of approximately 21,000 cubic feet of low-level radioactive waste. The project was completed within the revised budget, without any NOVs, and without any OSHA recordable incidents.

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5. **DOE Y-12 National Security Complex (Oak Ridge, TN) – Buildings 9769 & 9211 (completed January 2011)**: NorthStar decommissioned radiologically contaminated structures within an active DOE/NSA weapons facility, which included segregation, packaging, and transportation of low-level radioactive waste and other hazardous wastes, including 62,100 cubic feet of radiological contaminated debris. The project was completed within the approved budget, without any NOVs, and without any OSHA recordable incidents.

6. **University of Arizona – Nuclear Reactor Lab & TRIGA Reactor (completed November 2011)**: NorthStar decommissioned this reactor and its support systems, removing all radioactive materials from the site such that the site could be released for unrestricted use. The project was completed under budget, without any NOVs, and without any OSHA recordable incidents.

7. **University of Washington – Nuclear Reactor (completed November 2006)**: NorthStar decommissioned this reactor and related structures. The project was completed within the approved budget, without any NOVs, and without any OSHA recordable incidents.

8. **DOE Pit 9 (Idaho Falls, ID) – Remediation Treatment Facility (completed June 2007)**: NorthStar decommissioned this radiological waste processing facility. The project was completed within the approved budget, without any NOVs, and without any OSHA recordable incidents.

9. **VA Medical Center (Omaha, NE) – Research Reactor (completed July 2016)**: NorthStar decommissioned this research reactor and structures. The project was completed within the approved budget, without any NOVs, and without any OSHA recordable incidents.

Orano Projects

1. **Würgassen Nuclear Power Station (Germany)**. Orano performed segmentation of the reactor vessel and internals for this boiling water reactor ("BWR"). The phase concerning the internals started in 2006 and was completed in 2008; the phase concerning the vessel started in 2008 and was completed in 2010. Both phases were completed within the time period and monetary amount budgeted for them, and without any regulatory, environmental, or safety issues or NOVs.

2. **Stade Nuclear Power Station (Germany)**. Orano performed segmentation of the reactor vessel and internals for this pressurized water reactor ("PWR"). The project was started in 2007 and completed in 2009, again on schedule and within budget, and without any regulatory, environmental, or safety issues or NOVs. The reactor at CR3 Facility is also a PWR.

3. **Rancho Seco Nuclear Generating Station (California)**. Orano performed segmentation of the reactor vessel and internals for this PWR. The project was started in 2005 and completed in 2006, again on schedule and within budget, and without any regulatory, environmental, or safety issues or NOVs.

4. **Millstone Unit 1 (Connecticut)**. Orano performed segmentation of the reactor vessel and internals for this BWR. The project was started in 2002 and completed in 2004, remaining on schedule and within budget, and without any regulatory, environmental, or safety issues or NOVs.

5. **Maine Yankee Nuclear Power Plant (Maine)**. Orano performed decommissioning of the reactor vessel internals for this PWR. The project was started in 1999 and completed

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in 2001. The project was completed on schedule and within budget, and without any regulatory, environmental, or safety issues or NOVs.

1. REQUEST FOR INFORMATION OVERVIEW

1.1. Objective

Duke Energy is inviting companies to participate in a Request for Information (RFI) for the decontamination and dismantlement (D&D) of its Crystal River 3 nuclear plant (CR3). The goal of this RFI is for respondents to highlight their functional and technical capabilities and suggest contractual and project execution approaches that result in CR3 becoming an Independent Spent Fuel Storage Installation (ISFSI) site only. Achieving this goal also requires submitting and seeking approval of a partial license termination plan to the Nuclear Regulatory Commission (NRC).

1.2. Project Background

On February 5, 2013, Duke Energy announced the permanent retirement of CR3. Since that time, the decommissioning team has primarily focused on transferring the station's used nuclear fuel assemblies into an on-site dry cask storage facility, abandoning plant systems and components and changing the station's licensing bases to match current site conditions. These efforts will be completed by the end of 2019. Duke Energy's current decommissioning strategy is the long-term SAFSTOR model as described in the post-shutdown decommissioning activities report; however, Duke Energy will be exploring the potential benefits of an accelerated D&D strategy.

1.3. Expected Condition of Plant

The expected condition of CR3 at the time of the project initiation will be:

- Used nuclear fuel assemblies will be stored in the ISFSI.
- AC and DC power will be removed from the power block with the exception of the power system used in the hot shop.
- Permanent plant systems will be abandoned in place with the exception of a few select pieces of equipment Duke Energy has removed.
- The used fuel pool will be drained and abandoned, and the fuel storage racks will be removed from the site.
- Unmaintained site equipment will need to be recovered for use.
- Duke Energy will ensure applicable rules and regulations associated with ISFSI security, emergency planning and other required programs for a dormant plant are followed.
- The vendor will need to identify and acquire any licensing and permitting requirements for D&D.

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 6
PARTY: DUKE ENERGY FLORIDA – DIRECT
DESCRIPTION: Matthew Palasek MP-1

2. DELIVERY REQUIREMENTS AND CONSIDERATIONS

2.1. Delivery of Information

Respondents shall deliver a written response based on the information and questions within this RFI. Such responses shall be submitted via the PowerAdvocate tool ***no later than December 11, 2017, at 5 p.m. Eastern Standard Time***.

2.2. Requirements:

- Upload all supporting documentation necessary to review your information prior to December 11, 2017, at 5 p.m.
- For RFI communications, use the "Messaging" feature in PowerAdvocate tool. Suppliers shall not contact Duke Energy team members directly to answer questions or discuss the RFI.
- Respondents must respond in writing.
- All information received will become the property of Duke Energy and will not be returned.
- Duke Energy reserves the right, in its sole discretion, to seek additional information or clarification from any respondent.

3. GENERAL VENDOR INFORMATION

Please provide your company's legal business name, address, a primary contact name and contact information.

4. EXPERIENCE AND AVAILABILITY

Duke Energy would like to understand your experience and availability within the nuclear D&D market. Please provide the following information:

4.1. List all D&D projects your company has performed as the prime contractor or subcontractor. Include the project name, contract structure (including any partners and their scope, if appropriate) and completion date or scheduled completion date.

4.2. List projects your company is currently bidding on or plans to bid on in the next 24 months.

4.3. Describe if your company foresees any capacity constraints on executing future projects. If so, how do you plan to address those constraints?

5. CONTRACT STRUCTURE

5.1. What contract structures have you used in the past to execute a D&D project, e.g., general contractor, license custodian, license transfer, fuel transfer, etc.?

5.2. Does your company have a preferred contract structure? If so, given that contract structure:

5.2.1. What are the advantages in terms of safety and cost assurance?

5.2.2. What risks would Duke Energy retain?

5.2.3. What are the implications, if any, for the nuclear decommissioning trust fund?

5.2.4. How would your company financially support any contractual commitments?

5.3. If your company bids on the D&D project, do you expect to pursue an alliance to bid the project? If so, which entities would you consider as target alliance partners?

5.4. Are there contract structures your company is not willing to bid on? If so, list those contract structures.

5.5. What role or expectations do you foresee for Duke Energy?

6. SCOPE AND PLANNING

6.1. What scope does your company typically include in a D&D project?

6.2. What scope does your company typically exclude in a D&D project?

6.3. What phases does your company typically break a project into?

6.4. What are key activities in each phase?

6.5. Please provide an overall project timeline from initial selection to the initiation of D&D activities.

7. DUE DILIGENCE

7.1. How long does your company typically expect a due diligence period to be?

7.2. What does your company see as the key risks in a D&D project?

7.3. How would your company perform due diligence to assess project risks?

8. EXECUTION

8.1. How does your company plan to mitigate the key risks identified in Sections 5 and 7?

8.2. Does your company have any key lessons learned from prior projects? Particular areas of interest include:

- Segmentation of the reactor vessel and internals.
- Methods to minimize release of radioactive effluents.
- Methods to mitigate non-radiological hazardous materials.
- Efficient management and shipment of radiological material.

8.3. Describe your typical project planning and execution organizational structure.

8.4. What would be your expected duration for the CR3 D&D project?

9. SAFETY

9.1. Does your company have its own safety program? If so, please describe the key elements of the program.

9.2. Does your company have an ALARA program and Respiratory Protection program? If so, please describe the key elements of the programs.

10. EXTERNAL STAKEHOLDERS

10.1. How does your company manage its relationships with local officials?

10.2. How does your company manage its relationships with state and federal officials?

10.3. How does your company manage its relationships with the local community, including customers and plant neighbors?

11. OTHER

11.1. What unique qualifications or other information would you like to share about your company's preferred model for implementing D&D projects?

11.2. What concerns, if any, do you have about successfully implementing a D&D project at CR3?

11.3. In support of preparing a potential request for proposal for D&D Services, please provide a listing of requisite site information and data, necessary site access, or other information that would be helpful in submitting a comprehensive bid response.

12. DISCLAIMER

This RFI is confidential and proprietary to Duke Energy. Respondents may not, and agree they will not, duplicate, distribute or otherwise disseminate or make available this document or the information contained in it without the express written consent of Duke Energy, which may be withheld for any reason within Duke Energy's sole discretion. Only the Duke Energy sourcing specialist shall grant consent. Notwithstanding the foregoing, respondents may make this document available to employees who have a need to know its contents to participate in the preparation of a Request for Proposals process and who are bound by contract to keep information confidential. Respondents shall not use or disclose to any third person any data, designs, drawings, specifications or other information belonging to, supplied by or on behalf of Duke Energy.

This RFI shall not be construed in any way to create an obligation on the part of Duke Energy to enter into any contract or serve as a basis for any claim whatsoever for reimbursement of costs for efforts expended. Furthermore, responding to this RFI does not commit or obligate Duke Energy in any way to pay for or reimburse any costs incurred by any respondent for the preparation of any response to this RFI or to procure or contract for services. Any such costs will be at the respondent's sole expense. Moreover, the scope of this RFI may be revised at the sole discretion of Duke Energy at any time, and this RFI may be withdrawn or canceled by Duke Energy at any time. Duke Energy reserves the right to waive formalities and to add, modify or delete items, requirements and terms or conditions prior to the conclusion of this RFI whenever it is deemed to be in Duke Energy's best interest. Duke Energy reserves

the unilateral right to reject any or all responses submitted hereunder for any reason whatsoever. Duke Energy shall be held free from any liability resulting from the use or implied use of the information submitted in any response to this RFI.

Accelerated Nuclear Decommissioning Project

Crystal River Unit Three Nuclear Generating Plant

Request for Proposal

Bid Instructions

Revision 0:

May 18, 2018

Project Location

Duke Energy – Crystal River Three

15760 W Power Line St,

Crystal River, FL 34428

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 7
PARTY: DUKE ENERGY FLORIDA – DIRECT
DESCRIPTION: Matthew Palasek MP-2

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I. Request for Proposal Objectives

A. Objective of Request for Proposal

The purpose of this Request For Proposal (RFP) is to solicit bids for the Accelerated Nuclear Decommissioning of the Crystal River Unit 3 (CR3) facility. This document provides instructions for bidding on the RFP. The accompanying Accelerated Nuclear Decommissioning Project RFP document provides further details on the project, including the scope of work ("Accelerated Nuclear Decommissioning Project" or "Project").

On February 5, 2013, Duke Energy Florida, LLC ("Duke Energy" or the "Company") announced the permanent retirement of CR3. Since the announced retirement, the decommissioning team has transferred the station's spent nuclear fuel assemblies into a dry cask storage facility within the on-site Independent Spent Fuel Storage Installation (ISFSI). The decommissioning efforts are currently focused on abandoning plant systems and components and transitioning to "Cold and Dark" status as well as changing the station's licensing bases to match current site conditions. These efforts are expected to be completed by the second quarter of 2019.

The Company's current decommissioning strategy is the long-term SAFSTOR model as described in the Post-Shutdown Decommissioning Activities Report (Appendix C1); however, the Company is issuing this RFP to explore the potential economic and risk mitigation benefits of an accelerated Decontamination and Dismantlement (D&D) strategy. Qualified potential suppliers that are invited to respond to this RFP, (each a "Bidder" and, collectively, the "Bidders"), will be instrumental in assisting in the decommissioning strategy evaluation effort. In addition, the Company wants to identify the Bidder that provides the best overall value while demonstrating commitment to safe work practices, radiological protection, environmental protection, and the ability to mitigate risks and successfully complete the decommissioning of CR3 as described in this RFP.

The Company expects to assess potential strategic partners as well as their proposed solutions for decommissioning across the following criteria:

- **Safety**: The Company intends to evaluate the Bidders' experience and approach to safe work practices and assess the Bidders' safety programs, as well as environmental and radiological protection programs.

- **Total Cost for Decommissioning**: The Company intends to evaluate proposals against the current SAFSTOR Decommissioning Cost Estimate model and determine whether sufficient funds are available in the Nuclear Decommissioning Trust (NDT) for accelerated decommissioning activities, including the on-going operations and maintenance of the CR3 ISFSI and site restoration once the spent nuclear fuel is removed from the site. Prudency in the utilization of the

NDT in completing the defined work scope is one of the Company's overarching objectives. Proposals will be assessed to determine the best value for Duke Energy customers by considering the total cost of decommissioning with Company and Bidder proposed resources and on-going operational costs.

- **Risk Mitigation**: The Company intends to assess risks associated with an accelerated decommissioning strategy against our current SAFSTOR strategy. The transfer of risks to a decommissioning strategic partner and mitigation of these risks will be considered. The Company expects to assess the lowest risk options associated with the submitted proposals.

- **Ability to Execute**: The Company intends to assess Bidders and their proposed solutions to evaluate decommissioning experience, expertise, performance quality, financial condition, and best practices approach and methods. Bidders will be evaluated on their ability to successfully and safely perform and complete the required Project scope associated with the accelerated decommissioning strategy.

- **Regulatory Support and Compliance**: The Company intends to evaluate the Bidders experience with federal, state and local regulations and regulatory agencies, including experience with the application process used by such agencies; as well as the Bidders past successful interactions with regulatory agencies with jurisdiction over the Project and the work. Each Bidder must demonstrate it is appropriately licensed and qualified in the State of Florida and elsewhere as required to perform the work before the Bidder will be allowed to submit a proposal in response to this RFP.

The Company intends to use the information submitted in responses to this RFP to evaluate and select one or more Bidders that the Company determines, in its sole discretion, satisfies the evaluation criteria and demonstrates both past successful performance history and the ability to successfully complete the Project.

B. Decommissioning Contracting Models

The Company is aware of the following decommissioning contracting models for performance of accelerated D&D services: Self-Perform; Decommissioning General Contractor; License Stewardship; and Asset Acquisition. Except for the Self Perform model, each model is described in Section 1.2 of the RFP Project Scope document.

The Company has not made any determination pertaining to the preferred contracting model, with the exception that it is no longer considering the Self-Perform model. The RFP is intended to evaluate the benefits of the other contracting models, including but not limited to: 1) the total cost and risk

mitigation of the different models; 2) the ability of the Bidder to execute its proposal; 3) the ability to provide regulatory support and comply with regulatory requirements; and, 4) the compliance with environmental health and safety requirements. Bidders are requested to submit their proposals based on their preferred contracting model that best achieves the Company's evaluation criteria.

C. Alternative Proposal Options

Bidders are welcomed to submit alternative proposals based on an alternative contracting model(s) for consideration. Proposals may offer unique approaches that can provide demonstrated benefits to the affected ratepayers, which may include proposed alternatives to the work scope, schedule and activities. An example of an alternative proposal is a Bidder acquiring the ISFSI and spent fuel in conjunction with a license stewardship contracting model; or including decommissioning of Units 1 & 2 (details thereof could be provided during Due Diligence if selected).

In order to maintain a fair evaluation process, alternative proposals are subject to the following conditions:

- Alternative proposals will be considered only from Bidders providing a compliant proposal (as defined in Section IV.A of this document).
- Any alternative proposal shall be clearly identified as "ALTERNATIVE" on the document header and within the electronic document naming convention.
- Any alternative proposal shall clearly describe the deviations and exceptions from the stated RFP requirements, with a description of the merits of the proposed alternatives.
- A Bidder submitting an alternative proposal(s) shall clearly identify any assumptions, cost estimates, risks and terms and conditions associated with the alternative proposal(s) and document the same on the associated required submittals.

II. Accelerated Nuclear Decommissioning Project Sourcing Process

As discussed above, the Company will be assessing proposals to determine the feasibility of the Accelerated Nuclear Decommissioning Project and determine the preferred contracting model. The Company anticipates utilizing a multiple stage process to determine the Project feasibility and to make a bid award, if the Company determines, in its sole discretion, that the Project is feasible and in the best interests of its customers.

A. Stage One: RFP Process

The RFP process as documented herein will be used to evaluate proposed approaches, contracting models, Bidder qualifications, Project feasibility, and Project risks. In order to adequately assess the feasibility of the Project, Bidders

are required to provide a fixed cost proposal based on their understanding of the work scope with appropriate documented Project assumptions and qualifications. It is understood that due to the accelerated schedule and limited access provided during the RFP process, the Bidders may not have complete information pertaining to the site conditions and characterization, site restoration requirements and regulations. The Company will make limited due diligence information available to the Bidders during Stage One that the Company believes will enable all Bidders to develop and submit a proposal that is reasonably detailed with reliable cost estimates. Short listed Bidders will have an opportunity to perform further due diligence investigations and further refine their proposed pricing during negotiations.

Following the submission of the proposals, the Company intends to perform an economic and risk evaluation of the Project. A short listed group of Bidders may be asked to present their proposal to key Company stakeholders at a Company location to be determined. A subsequent assessment of Bidder customer references, financial stability, risk management and safety performance will be performed. It is anticipated that during this process a continued exchange of information between the Company and Bidders will be required.

Upon the completion of proposal evaluations and assessment of the Bidders' qualifications, the RFP evaluation team expects to be able to make a potential recommendation to the Company's Senior Management Committee Stakeholders as to whether to proceed with accelerated decommissioning. Senior Executive Approval decision on whether to proceed with the Project is anticipated to occur in late 2018 or early 2019.

B. Stage Two: Due Diligence

Subject to receiving Senior Executive approval decision to proceed with the Accelerated Nuclear Decommissioning Project, the sourcing process will transition into a detailed Due Diligence stage. During the Due Diligence stage, the Bidders will be allowed expanded access and sufficient time to perform necessary due diligence activities to enable negotiations and contracting. The Company expects that it will invite two to three Bidders to participate in the Due Diligence stage. Bidders will be allowed to have site access and perform mutually agreed analyses of the site to support the development of contractual agreement(s) with each Bidder and each Bidder's final and best offer. It is anticipated the Due Diligence stage will be conducted primarily in the first half of 2019.

C. Stage Three: Negotiated Agreement

Concurrent with the Due Diligence stage, the Company intends to enter into contract negotiations with the short listed Bidders. Reaching definitive agreement will be dependent on conducting a multistep process that is anticipated to occur during the period from April through June 2019. Anticipated steps will include

technical evaluations, commercial risk management evaluations, alignment on terms and conditions, total ownership cost evaluation and negotiation of the final agreement documentation.

III. RFP Submittal Requirements

The Company will be utilizing the Sourcing Intelligence Application from Power Advocate to conduct the RFP event. Bidders that have completed a signed Mutual Confidentiality Agreement in the form provided by the Company will be required to register and establish an account on Power Advocate in order to participate in the bid event. Instructions on access to Power Advocate and its usage functionality are available via Duke Energy's Supplier Resources.

Bidders' proposals must be received no later than 5:00 PM EDT on Friday, July 27, 2018 (hereinafter, the "Due Date"). Proposals shall be electronically submitted via Power Advocate Sourcing Intelligence CR3 Accelerated Nuclear Decommissioning Project RFP event. The Company may, in its sole discretion, elect not to accept proposals that are received after the deadline. All proposals must be valid for the duration of the RFP process. Once submitted, proposals cannot be withdrawn for the duration of the RFP process without the written consent of the Company.

In addition to submitting responses electronically, Bidders shall submit five duplicate hardcopy responses identical to the electronic submission (including all RFP file attachments) to the address provided below. The hardcopy responses must be received by 4:00 PM EDT, Tuesday, July 31, 2018.

Duke Energy
Crystal River Unit 3
15485 W Power Line St
Crystal River, FL 34428
Attn: Alan Fata

The RFP is administered by the following person, who is the designated Commercial Contact for this RFP.

Michael Taylor
Duke Energy, Lead Sourcing Specialist
299 1st Avenue N.
St. Petersburg, FL 33701
(727) 820-5139
Michael.Taylor@Duke-Energy.com

IV. RFP Submittal Process

A. Submittal Instructions

Bidders shall submit their proposal responses per the RFP schedule listed below in Sections IV–B and IV-C. The required submittal documents are described in Section 6.2 of the Accelerated Nuclear Decommissioning Project RFP document.

To be considered a compliant proposal, the proposal must: 1) address the full scope as described in the Accelerated Nuclear Decommissioning Project RFP document; 2) include all required submittal documents; and 3) provide the response in the format and schedule describe herein. The Company reserves the right to determine whether a proposal or Bidder is compliant or non-compliant in the Company's sole and absolute discretion.

B. RFP Submittal Document Requirements

1. **Mutual Confidentiality Agreement:** Receipt by a Bidder of the complete RFP document indicates that Bidder has executed a Mutual Confidential Agreement.

Due: May 17, 2018, 5:00 PM EDT

2. **Project Timeline**: Bidders shall provide a Project timeline that includes major periods identified in Section 6.1 of the RFP Project Scope document.

3. **Technical Approach and Statement of Qualifications**: Bidders shall provide a comprehensive, written narrative to document the proposed approach, contracting model, methods, tools, Project team, governance (roles, responsibilities, accountabilities for performance and risk ownership), as well as the Bidder's experience and qualifications in performing each of the major scope areas described in Section 6.1 of the RFP Project Scope document.

4. **RFP Commercial Questionnaire**: Bidders shall address the RFP commercial questionnaire items identified in Section 7 of the RFP Project Scope document, including information related to:

a) Supplier Profile Questionnaire

b) Project Organization Structure and Key Personnel

c) Safety Performance and Rating

d) Nuclear Project Lessons Learned

e) Risk Register

f) Decommissioning Cost Estimate

g) WBS Milestone Plan

h) Annual Cash Flow Statement

i) Sub-Contracting plan

j) Waste Disposal Pricing

k) Performance/Financial Assurance

l) Term Sheet – Key Terms

C. RFP Schedule

Activity	Expected Schedule*
RFP Mutual Confidentiality Agreement Submittal	Thursday, May 17, 2018 5:00 PM EDT
CR3 Accelerated D&D RFP Released CR3 Document Library SharePoint site access for preliminary due diligence opened for participating Bidders	Friday, May 18, 2018
CR3 Accelerated D&D Bidders Conference Meeting	Monday, June 4, 2018 1:00 PM EDT
CR3 Site Access and Walk downs	June 5 – 7, 2018 9:00 AM – 4:00 PM EDT

Submission by each Bidder of evidence that the Bidder holds all engineering and contractors licenses/certifications necessary to be able to perform the work in compliance with Florida Law	Friday, June 15, 2018 5:00 PM EDT
Last day for Bidders to submit questions to Company	Friday, June 29, 2018 5:00 PM EDT
RFP Submittal Due (electronic)	Friday, July 27, 2018 5:00 PM EDT
RFP Proposals Due (hard copy)	Tuesday, July 31, 2018 4:00 PM EDT
Identify Short List Bidder(s) for On Site Presentations	Friday, August 31, 2018
Conduct Bidder(s) Proposal Presentations	Sept. 10 – 14, 2018
Compile follow-up questions and secondary response for short listed Bidder(s)	Sept. 17 – 28, 2018
Communicate Bid Award Recommendations for inclusion in Due Diligence Phase	Friday, Nov. 30, 2018
Short listed Bidder(s) conduct Due Diligence for Accelerated D&D Project	Dec. 3, 2018 – May 31, 2019
Conduct Bidder(s) negotiations and finalize definitive agreement(s)	April 1 – June 28, 2019
Execute definitive agreement(s)	Wednesday, July 31, 2019

Note*: The above documented schedule is subject to revision based on the sole discretion of the Company. The schedule should be used only for planning purposes. Should a revision be required all Bidders will receive written confirmation in advance of the change.

D. Bidders Conference

Bidders that have executed a Mutual Confidentiality Agreement will be invited to participate in a mandatory Bidders Conference for CR3 Accelerated Nuclear Decommissioning Project RFP. The event is expected to be scheduled on Monday, June 4, 2018 from 1:00 PM to 4:00 PM at the Crystal River Unit 3 Nuclear Generation Station, Crystal River, FL 34428. Due to space limitations, invited participants will be allowed to include no more than five company representatives at this session.

The Bidders Conference is intended to address the following topics:

- Introduction of participating Company representatives and Bidders
- Overview of the Crystal River 3 Plant and Crystal River Energy Complex
- Discussion of the existing state of the plant and "Cold and Dark" modifications
- Discussion of environmental considerations
- Overview of the D&D work scope and requirements
- Overview of the sourcing process and RFP submittal requirements, rules of communication and engagement
- Review of procedures for site walk downs and access to CR3 document library
- Discussion of contracting strategies and key terms
- Discussion of commitment to corporate responsibility (Supplier Diversity, Local Economic Impact, Sustainability)
- Overview of the sourcing communication process

Following the Bidders conference, Bidders will be allowed access to the CR3 site to conduct walk downs and non-destructive evaluations of the plant's facilities, structures, systems and components. Note that walk downs will exclude the containment building and any other high radiation areas. Access to the plant will be available between 9:00 AM and 4:00 PM and limited for one day per each Bidder to take place between June 5 – 7, 2018.

Bidders must request in writing prior to the Bidders conference their requested site access, schedule, participating personnel, and activities that they would like to perform during this period. Requests should be submitted through the Sourcing Event Messaging within Power Advocate. It will be in the Company's sole discretion to determine if Bidders are permitted to perform the requested evaluation activities, as well as determine the requested site access and necessary escort provisions. Access to the ISFSI location may be limited due to Nuclear Security Operations requirements for access; however, visual inspections can be performed outside the ISFSI site.

E. CR3 Document Library

In order to assist Bidders with their preparation of proposals, the Company has established a CR3 document library. The library will be available on an externally accessible SharePoint site that will require restricted access, privileges and conditions. Bidders must have executed the Mutual Confidentiality Agreement in order to be given access to the document library.

The CR3 Accelerated Nuclear Decommissioning Project team assembled documents to support the Bidders' evaluation of the site conditions and scope of the work. All Bidders will have access to the same document library. The sourcing communications process will be used to address any questions pertaining to the library and associated documents. Expected documents that are intended to be made available are listed in Section 8 of the RFP Project Scope document.

F. RFP Communication Process

Bidders shall only communicate with the Commercial Contact during this RFP proposal, evaluation, and selection process. Bidder will not communicate with, or attempt to communicate with, the following: 1) any member of the RFP evaluation team including their management team or anyone participating on behalf of the Company in the evaluation process; 2) any consultant or outside advisor assisting the Company in this RFP; or, 3) other personnel employed or engaged by the Company to perform work at CR3, except as strictly permitted in this RFP.

If information or clarification is needed in order to submit a bid response, such information shall be requested from the Company directly from the messaging capability within Power Advocate CR3 Accelerated Decommissioning RFP event. The messaging tool is intended to be available to all core Company RFP team members and will inform each member of the request. The Company at its discretion may communicate a response to all Bidders participating in the RFP process to ensure information is equally available.

The Company expects each Bidder to familiarize itself with the CR3 site, CR3 Operational Management Systems, and the documents available within the CR3 Document Library. If the Bidder requires additional access or information as part of its proposal development, the Bidder should request additional information from the Company's Commercial Contact.

G. Commitment to Corporate Responsibility Sourcing

Duke Energy's customers value clean, low cost, reliable energy and they value corporate citizenship. As such, it is important to develop a sourcing approach that balances all these factors, while fully leveraging opportunities to demonstrate Corporate Responsibility. By including local, diverse suppliers, and

environmentally sustainable solutions, we can ensure we are selecting suppliers that create broader value for Duke Energy customers and communities.

Depending on the chosen contracting model, it is our goal to implement a target on the utilization of Diverse and Local suppliers that will be developed based on this proposal. If applicable, based on responses received, the Company may require the awarded contractor to provide a detailed Subcontracting Plan (Attachment 8 herein) demonstrating how the contractor will achieve the Target Spend with sample key performance indicators. Target Spend should be met without causing impractical cost or risk to the work requirements. Bidders may use the Subcontracting Plan in their proposals to assist in responding to the Diverse and Local Subcontracting questions.

Once awarded and if applicable, Duke Energy's Supplier Diversity organization will support the completion and execution of a Subcontracting Plan. Supplier Diversity can assist in providing (1) vendor identification (2) lists of community economic organizations that can support outreach, identification, and education, and (3) instructions on how to report Diverse and Local Spend in Duke Energy's Tier II online reporting tool.

DEFINITIONS:

Target Spend -- Suggested total spend with Diverse and/or Local Suppliers by the Bidder within a calendar year or during performance of specific contract awarded by Duke Energy to the Bidder.

Third Party Certified – the Diverse Supplier has obtained a certification of diverse supplier status from a certifying organization such as Women Business Enterprise National Council (WBENC), National Minority Supplier Development Council (NSMDC), Veterans Administration, or other State, Federal or Local government entities.

Diverse Supplier Definitions:

- Minority-Owned Business Enterprise (MBE) -- At least 51 percent owned, managed and controlled by one or more African Americans, Hispanic Americans, Native Americans, Asian Indian Americans or Asian Pacific Americans.
- Women-Owned Business Enterprise (WBE) -- At least 51 percent owned, managed and controlled by one or more women.
- Veteran-Owned Business Enterprise (VBE) -- At least 51 percent owned, managed and controlled by one or more veterans.
- Service-Disabled Veteran-Owned Business Enterprise (SVBE) - At least 51 percent owned, managed and controlled by one or more individuals with a service-connected disability.
- 8(a) -- Small disadvantaged businesses that are certified as 8(a) by the Small Business Administration.
- HUBZone Business -- Small business operating in a historically underutilized business zone owned and controlled by one or more U.S.

Citizens, where at least 35 percent of its employees reside in a HUBZone. HUBZone businesses must be certified by the Small Business Administration.

Local Spend: Bidder or subcontractor that has one or more of the following in one or more of Duke Energy's service states (FL, NC, SC, OH, IN, KY):

1. Local branch/office
2. Headquarters
3. Manufacturing of materials or majority of work requirements performed by Local Employees

H. Reservation of Rights

Any information or documents that the Bidder provides in response to this RFP will be owned by the Company and can be used by the Company in this RFP process, as the Company determines appropriate and consistent with its procurement policies.

The Company reserves the right at any time, in its sole discretion, to abandon this RFP process; to change any dates specified in this RFP; to add, modify or otherwise change the basis for evaluation of the Bidders and the proposals; to terminate further participation in this process by any Bidder; to accept any proposal; to evaluate or decline to evaluate the qualifications of any Bidder or the terms and conditions of any proposal; to change any form, document, term or condition used in this RFP; to waive any informalities, irregularities or non-compliance in any proposal; to elect to negotiate with multiple Bidders; or to not short-list or select any Bidder and to reject any or all proposals, all without prior notice and without assigning any reasons, and without liability to any Bidder. The Company does not make any guarantee that a contract award will result from this RFP.

This RFP and the information provided in connection with this RFP is non-binding and does not constitute an offer to contract, nor shall the submission of proposals by Bidders or the Company's evaluation of any such proposals constitute acceptance of an offer by a Bidder. None of the Company or the Bidders will be bound by this RFP or any document provided in connection with this RFP, including but not limited to any proposals submitted in response to this RFP, unless and until authorized representatives of the Company and the Bidder execute a written definitive agreement (provided that the foregoing does not serve to limit the non-disclosure agreement that the Company signed with each Bidder prior to release of this RFP to such Bidder).

Bidders are required to provide accurate and complete responses to the RFP documents. Incomplete responses may be subject to disqualification in the Company's sole discretion. The Company may reject any response that is conditional or incomplete, or that contains any deviations from the instructions provided in these Instructions to Bidders.

Each Bidder will bear its own costs in connection with this RFP. Neither the Company nor any of its affiliates will have any obligation to pay or reimburse any Bidder for costs incurred by the Bidder or any of its affiliates in connection with the Bidder's participation in the RFP, including but not limited to, costs associated with Bidder's travel expenses, costs to prepare its proposal and costs to participate in negotiations.

The Company has retained Morgan, Lewis & Brockius LLP as its legal advisors throughout the RFP and negotiation process. Bidders must be willing to provide consent and waive any potential conflicts of interest as necessary so that the Company can continue to work with its selected counsel.

[END OF DOCUMENT]

Accelerated Nuclear Decommissioning Project

Crystal River Unit Three Nuclear Generating Plant

Request for Proposal

Project Scope

Rev. 0

May 18, 2018

Project Location

Duke Energy – Crystal River Three

15760 W Power Line St,

Crystal River, FL 34428

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1. CRYSTAL RIVER UNIT 3 NUCLEAR DECOMMISSIONING PROJECT OVERVIEW

1.1. Introduction

Crystal River Unit 3 (CR3) is a single-unit pressurized light-water reactor (PWR) supplied by Babcock & Wilcox. CR3 was initially licensed to operate at a maximum of 2,452 megawatt-thermal (MWt). In 1981, 2002, and 2007, the Nuclear Regulatory Commission (NRC) approved three requests to increase the licensed core power level to a maximum power level of 2,609 MWt. The reactor containment structure is a steel-lined, reinforced-concrete structure in the shape of a cylinder and capped with a shallow dome. The walls of the containment structure are approximately 3.5 feet thick. Cooling water for CR3 is drawn from and returned to the Gulf of Mexico.

A brief history of the major milestones related to CR3 construction and operational history is as follows:

- Construction Permit Issued: September 25, 1968
- Operating License Issued: December 3, 1976
- Commercial Operation: March 13, 1977
- Initial Operating License Expiration: December 3, 2016
- Final Reactor Shutdown: September 26, 2009
- Final Removal of Fuel from Reactor Vessel: May 28, 2011
- ISFSI Operational with All Fuel Removed from the Spent Fuel Pool: January 12, 2018
- Plant in “Cold and Dark” Status: August 31, 2019 (projected)

On February 20, 2013, Duke Energy (the “Company” or “Duke Energy”) provided the NRC with the certification required by 10 CFR 50.82(a)(1)(i) and (ii), that operation had permanently ceased and that all fuel had been permanently removed from the reactor vessel at CR3. Upon docketing of these certifications pursuant to 10 CFR 50.82(a)(2), the 10 CFR Part 50 license for CR3 no longer authorized operation of the reactor or placement or retention of fuel in the reactor vessel. On March 13, 2013, the NRC acknowledged the certification of permanent cessation of power operation and permanent removal of fuel from the vessel.

On February 5, 2013, the Company announced the permanent retirement of CR3. Since that time, the decommissioning team has primarily focused on transferring the station’s spent nuclear fuel assemblies into an on-site dry cask storage facility (ISFSI), abandoning plant systems and components and changing the station’s licensing bases to match current site conditions. These efforts are expected to be completed by the end of 2019. Duke Energy’s current published decommissioning strategy is the long-term SAFSTOR model as described in the Post-Shutdown Decommissioning Activities Report (PSDAR) [Ref Appendix C.1]; however, Duke Energy is exploring the potential benefits of an accelerated Decontamination and Dismantlement (D&D) strategy.

The selection of a preferred decommissioning alternative is influenced by a number of factors at the time of plant shutdown. These factors include the cost of each decommissioning alternative, minimization of occupational radiation exposure, availability of low-level waste disposal facilities,

availability of a spent nuclear fuel and High Level Waste, including but not limited to GTCC (hereinafter called "HLW") repository or a Department of Energy (DOE) interim storage facility, regulatory requirements, and public concerns. In addition, 10 CFR 50.82(a)(3) requires decommissioning to be completed within 60 years of permanent cessation of operations.

This document describes the D&D work scope anticipated to be performed by the contractor to remove the facility from service, reduce residual radioactivity to levels permitting unrestricted release, restore the site, perform this work safely, and complete the work in a cost effective manner.

Additionally, management of the ISFSI will continue until a spent nuclear fuel and HLW repository or a DOE or other interim storage facility is made available and the spent nuclear fuel and HLW is removed from the site. **Bidders (also sometimes referred to as Contractors, vendors or suppliers) will be asked for alternative approaches for this management activity.**

The D&D work scope will be performed in phases congruent with periods described in the Decommissioning Cost Estimate (DCE) [Ref A.1] starting with DCE Period 3:

Phase 1 – D&D Planning:

DCE Period 3 – Preparations for Decommissioning

Phase 2 – D&D:

DCE Period 4a – Large Component Removal

DCE Period 4b – Site Decontamination

Phase 3 – License Amendment/Termination and Site Restoration:

DCE Period 4f – License Amendment/Termination

DCE Period 5b – Site Restoration

Phase 4 – On-going ISFSI Management

DCE Period 2b – (through all phases) as applicable to the contracting model chosen

1.2. Decommissioning Contract Model Options

Duke Energy requires Contractors to bid on any or all models and variations as described in Section I.C. of the Bid Instructions, as further described below:

- Decommissioning General Contractor
- License Stewardship (Temporary Operator License Transfer)
- License Stewardship with Sale (Asset Sale and Temporary License Transfer)
- Asset Acquisition (Asset Sale and Permanent License Transfer)

With respect to Decommissioning General Contractor and License Stewardship, Duke Energy intends to hold and manage the Nuclear Decommissioning Trust (NDT) with payments released to contractor upon satisfaction of mutually agreed milestones, and in no case greater than the fixed cost for the work. Any funds in excess of the fixed cost at the end of the project will be returned to Duke Energy for continued ISFSI operations and decommissioning, with any remaining balance returned to Florida retail customers.

With respect to License Stewardship with Sale and Asset Acquisition, Duke Energy will transfer the entire NDT to the Bidder; provided, however, that the Bidder will be required to segregate the NDT into two accounts – an account with an initial balance equal to the fixed cost (the "Project Account") and an account with an initial balance equal to the difference between the total NDT balance and the fixed cost (the "Reserve Account"). The Bidder will have the right to use and access the funds in the Project Account but will not have the right to use and access the funds in the Reserve Account. At the end of the project, the Bidder will for (i) License Stewardship, transfer the Reserve Account to Duke Energy for continued ISFSI operations and decommissioning, with any remaining balance returned to Florida retail customers and (ii) Asset Acquisition, liquidate the Reserve Account and disburse the funds to Duke Energy for return to Florida retail customers.

Contractors are to refer to Table 1.0 for the anticipated Division of Responsibilities (DOR) for each of the contracting models.

Decommissioning General Contractor

Major decommissioning tasks are contracted to an experienced Decommissioning General Contractor (DGC) (referred to as the Decommissioning Operations Contractor (DOC) in the DCE, although it is a fixed-price general contracting arrangement). Duke Energy continues to own the license and have full responsibility as the NRC licensee for the decommissioning, strategic project planning, ISFSI management, and licensing, and remains in control of the NDT. The DGC will assume responsibility for some major programs and perform the physical D&D tasks. This is similar in structure to the SONGS decommissioning model.

License Stewardship

License Stewardship (LS) is the transferring of lead or full responsibility under the 10 CFR Part 50 license to a vendor that will decommission the facility. The vendor typically forms a special purpose entity (SPE) to hold the NRC license and perform the decommissioning. The LS model requires NRC approval of the transfer of the NRC license. The Contractor will negotiate with the Company to operate and maintain the ISFSI, provide security for the ISFSI and continue to perform other security functions at the CR-3 Site.

LS Model 1 – A couple of different permutations of the LS model are possible. In the first permutation, the lead "operator" responsibility under the NRC license is transferred to the SPE, while the Company retains ownership of CR3, spent nuclear fuel and HLW, and the NDT, and remains the "owner" licensee. Thus in this model, the SPE has control over NRC licensed activities at CR3 but not title or ownership. Contractual terms specify that full licensed responsibility for the site, including the ISFSI, will be

transferred back to Duke Energy when the decommissioning is complete and the license is partially terminated such that the NRC licensed area is reduced to the ISFSI area only. This is similar in structure to the LaCrosse decommissioning model.

LS Model 2 – In another LS permutation, the Company would transfer the NRC license to the SPE, including the right to possess (but not own) spent nuclear fuel and HLW, and the SPE would also take ownership of the CR3 facilities and a portion of the NDT. However, the SPE would lease, not own, the real property on which the CR3 facilities are located. Contractual terms specify that full licensed responsibility for the site, including the ISFSI, and all ownership rights will be transferred back to Duke Energy when the decommissioning is complete and the license is partially terminated such that the NRC licensed area is reduced to the ISFSI area only. This is similar in structure to the Zion decommissioning model.

License transfer is governed by existing regulations, including but not limited to:

- 10 CFR Part 2, Subpart M (10 CFR 2.1301)
- 10 CFR 50.75
- 10 CFR 50.80

Asset Acquisition

Asset Acquisition (AA) involves the transfer to a SPE of the 10 CFR Part 50 license, the NDT, and the assets comprising the CR3 facility, including the ISFSI and the spent nuclear fuel and HLW, and the SPE's assumption of all obligations and liabilities associated with the 10 CFR Part 50 license and the CR3 facility, including spent nuclear fuel and HLW. The SPE will also be granted rights to the NRC licensed site as necessary to meet NRC requirements pursuant to lease/easement arrangements, in order to perform decommissioning activities and operate and maintain the ISFSI until the spent nuclear fuel and HLW is removed from the site, the ISFSI is decommissioned, the 10 CFR Part 50 license is terminated, and site restored. The SPE shall decommission and restore the ISFSI. As portions of the NRC licensed site are released from the 10 CFR Part 50 license, the SPE's rights with respect to those portions of the site will expire. Duke Energy will relinquish all ownership interest and involvement with the CR3 facility, including the ISFSI and spent nuclear fuel and HLW, but will retain ownership of the real property that makes up the NRC licensed site. This is similar in structure to the Vermont Yankee decommissioning model. As with the "License Stewardship" Model, the NRC license transfer requires NRC approval.

Table 1.0 Typical DOR for Various Models						
	DGC		LS		AA	
Task/Area	**Contractor**	**Company**	**Contractor**	**Company**	**Contractor**	**Company**
Transition Management	✓	✓	✓	✓	✓	✓
Project Management	✓	✓	✓		✓	
Program Management						
• Procedures	✓		✓		✓	
• Transition Plans	✓		✓		✓	
• Health & Safety Program	✓		✓		✓	
• Management & Maintenance of Facilities	✓		✓		✓	
• ISFSI FFD Program	✓		Model 2	Model 1	✓	
• Training Program	✓		✓		✓	
• Industrial Security (Non-ISFSI)	✓		✓		✓	
• Radiation Protection Program		✓	✓		✓	
• Fire Protection Program		✓	✓		✓	
• Configuration Management	✓	✓	✓		✓	
• Chemistry & Environmental Programs		✓	✓		✓	
• Waste Management Program		✓	✓		✓	
• 10 CFR Part 37 Compliance		✓	✓		✓	
License Termination (Amendment) to ISFSI Only		✓	✓		✓	
ISFSI D&D, License Termination, and site restoration		✓		✓	✓	
Site Labor Management	✓		✓		✓	
System Decontamination	✓		✓		✓	
Site Characterization	✓		✓		✓	
Large Component Removal	✓		✓		✓	
Commodity Removal	✓		✓		✓	
Waste Packaging, Shipping, Disposal	✓		✓		✓	
Licensing		✓	✓		✓	
Health Physics Coverage	✓		✓		✓	
Station Administration	✓	✓	✓		✓	
Procurement	✓		✓		✓	
ISFSI Management, Engineering, Security and Emergency Planning		✓	Model 2	Model 1	✓	
End State Status Surveys	✓		✓		✓	
Asset Recovery	✓		✓		✓	
Repowering/System Recovery	✓		✓		✓	
Site Restoration	✓		✓		✓	
NDT Control		✓	TBN[1]	TBN[1]	✓	
CREC Coordination	✓	✓	✓		✓	

[1] To be negotiated

2. NUCLEAR DECOMMISSIONING PROJECT OBJECTIVES AND SITE DESCRIPTION

2.1. Project Objectives

The D&D project objectives are for the Contractor to:

- remove structures, systems, and components (SSC) from the facility
- pack and ship radioactive waste off-site
- reduce residual radioactivity to levels permitting unrestricted release of the site
- pack and ship hazardous waste off-site
- restore the site
- perform this work safely
- complete the work in a cost effective manner
- comply with all applicable Federal, State, and Local laws, statutes, rules and regulations, zoning, guidelines, interpretations, acts, requirements, permits, codes and standards, and licenses

The expected final condition of CR3 at the time of the project completion (decommissioning end state) is defined in Section 3.1.

Refer to Sections 3.0 and 4.0 for detailed scope and site restoration requirements.

2.2. Description of CR3 Operating Facilities

Duke Energy is the owner and operator of the Crystal River Nuclear Unit 3 (CR3). The Crystal River site (Owner Controlled Area (OCA)) consists of 4,738 acres owned and controlled by Duke Energy including a ¼ mile wide access strip provided for railroad, road, and transmission line right-of-way extending from the plant to U.S. Highway 19. There are no public access roads to areas adjacent to the plant site except at the plant access road. The north and south site boundaries are bordered by woods and swamps and are generally inaccessible. Directly west of the plant is the Gulf of Mexico [Ref Appendix A.2]. Plant site layout is provided in Reference Appendix A.3. Detailed Plant Descriptions can be found in Reference Appendix C.2 and as supplemented by plant drawings located in the CR3 Document SharePoint site.

CR3 is situated in the Duke Energy Crystal River Energy Complex (CREC), which includes four (4) coal generating units: CR1 & 2 adjacent to and west of CR3; and CR4 & 5 located north of CR3. Also in the CREC are the two (2) new Citrus County Combined Cycle (CCCC) plants, located north east of CR3 [Ref. Appendix A.3]. The CCCC plants are expected to be on-line by the end of 2018, with limited impact to CR3 D&D anticipated at this time, outages notwithstanding. Similarly, CR4 & 5 are expected to be in-service with limited impact to CR3 D&D anticipated at this time, outages notwithstanding. As planned, CR1 & 2 are expected to be taken off-line in conjunction with the CCCC units going on-line with decommissioning commencing sometime thereafter. The exact dates and extent of CR1 & 2 events are not available; therefore, Bidders are asked to assume that they will be off-line at the end of 2019 and decommissioning performed immediately thereafter and completed by 2021. Bidders should consider

any potential impact of decommissioning of CR1 & 2 on the schedule for decommissioning of CR3. Additional details and information will be provided during the Due Diligence period of the RFP process.

2.2.1. Nuclear License Condition

The 10 CFR Part 50 license for CR3 no longer authorizes operation of the reactor or placement or retention of fuel in the reactor vessel. Detailed description of license requirements and commitments can be found in Reference Appendix C.2, *Defueled Safety Analysis Report,* and Reference Appendix C.4, *Defueled Tech Specs.*

CR3 has an Independent Spent Fuel Storage Installation (ISFSI) located on the east berm of the plant. The ISFSI has the capacity for 40 Dry Shielded Canisters (DSCs), each holding up to 32 fuel assemblies. The ISFSI consists of the NUHOMS Reinforced Concrete Horizontal Storage Modules, each containing one 32PTH1-TYPE 2W DSC, manufactured for CR3 by Areva TransNuclear Corporation, under Certificate of Compliance 1004, Amendment Number 14. The 10 CFR 72.212 Report provides additional details for the ISFSI complex and dry cask storage systems. This report documents how the CR3 site meets Part 72 requirements and has been issued as procedure ISFS-0212 [Ref. Appendix C.3].

2.2.2. Historical Site Assessment

The Historical Site Assessment (HSA) documents a comprehensive investigation that identifies and evaluates historical information pertaining to events that may have resulted in contamination during the operating history of CR3, for the purpose of assisting in planning for the decommissioning of the power plant. The CR3 HSA and site characterization information can be found in Appendix B, *HP and Environmental* folder in the CR3 Document Library SharePoint site.

2.2.3. Utilities and Transportation Assets and Access

Available utilities to and from the CR3 site are shown on Appendix A.3, and includes:

	CR3 Power Block	ISFSI Facility
Domestic Water (potable) water	Currently from CR1 & 2, assume not available, however, limited untreated well water may be available with contractor performed modification	Currently from CR1 & 2, assume from another source at start of D&D
Demin Water	Currently from CR1 & 2, assume not available, however, possible crosstie to CR4 & 5 may be available with contractor performed modification	N/A
Sewage	Currently to CR1 & 2, assume not available	Capacity limited to SOC facility only, and tied to CR4 & 5
Electrical Power	12 kV and maximum load of 5 mVA from A301 line	12 kV from A301 vi MTTR-15
Fire Service Water	Tank supply to fire header ring only, no installed makeup. See EC 407262 in Appendix F.	Capacity limited to SOC facility only from CR4 & 5
Telephone	Available	Dedicated Duke Energy Line

Note: CR3 power block utilities are subject to change dependent of the status of CR1 & 2 decommissioning.

Available transportation modes to and from the CR3 site are shown on Appendix A.3, and include:

- Site access road – A wide, two-lane access road connects the CR3 site with U.S.19 approximately 5 miles east of the plant. No other access roads to the CR3 site are available.
- Railroad line – The railroad spur into Crystal River plant is nine miles long from the railroad company right-of-way to the plant site. Only cars consigned to the Crystal River plant are brought into the plant site over the spur. A siding branches off the main spur and ends approximately at the coal conveyor east of the CR3 site. Contractor coordination with coal deliveries and rail usage is required. There may be a potential change in the responsibility for maintenance of the railroad spur within Duke Energy due to CR1 & 2 decommissioning. Any changes that may impact the Contractor will be negotiated with the Contractor.
- Barge access – Barge access via the intake canal is available.

2.2.4. Site Security and Access

CREC access is controlled at the Access Control Point (ACP) on the main plant access road; Duke Energy manages this access authorization and will work with the Contractor to provide necessary badging for all Contractor and subcontractor workers requiring site access.

Access to the CR3 site is controlled by the CR3 Radiation Protection organization for accountability and insurance purposes. Duke Energy expects this responsibility will be transferred to the Contractor, with timing of the transition depending on the contracting model.

Access to the ISFSI is controlled through the Duke Energy Corporate Nuclear Protective Services organization and Duke Energy expects this responsibility may transition to the Contractor, depending on the contracting model.

3. ACCELERATED DECOMMISSIONING PROJECT SCOPE

3.1. Contractor Scope and Decommissioning End State

The scope for the Contractor is to implement the following phased-approached activities:

1. D&D Planning – develop the following plans as detailed in Section 4.1:
    a. Transition Plan
    b. License Termination Plan
    c. Site Restoration Plan
    d. Waste Management Plan
2. Physical D&D – perform the following D&D activities as detailed in Section 4.2:
    a. Decontaminate and remove SSCs
    b. Hazardous, Non-Hazardous, and Radioactive Waste Management
3. License Termination and Site Restoration – perform the following D&D activities as detailed in Section 4.3
    a. Site characterization and license termination/amendment to ISFSI only (including the License Termination Plan to be submitted to the NRC for approval)
    b. Removing, excavating, or demolishing non-essential utilities, areas, roads, SSCs, and other features.
    c. Backfilling excavations and voids with material, as required by the regulatory closure requirements and Landscaping Plan.
    d. Providing drainage, planting, walkways, roads, and fencing as defined in the Landscaping Plan.
    e. Final site grading consistent with regulatory closure and ISFSI requirements.
4. ISFSI – perform the following activities as applicable to the contracting model selected:
    a. Program management, engineering, security and emergency planning.
    b. Physical D&D, license termination and site restoration.

The expected final condition of CR3 at the time of the project completion (decommissioning end state) will be:

- All SSCs removed
- All non-ISFSI system interties to other Crystal River Energy Complex (CREC) plants isolated and/or removed

- All designated buildings, structures, and pavement/asphalt removed
- Within the power block (all areas at berm elevation 119') entire area cleared to three (3) feet below grade level (defined as plant elevation of 119', i.e., the berm remains)
- Outside of the power block (all areas not at berm elevation 119') areas made permeable to existing grade
- Firing range structures removed and area remediated
- West settlement pond remediated, including influent and effluent piping, and filled to grade
- Site restored such that vegetation can grow providing erosion control
- Access to/from the ISFSI pad via the existing ISFSI sally port and haul path is maintained
- NRC license terminated to ISFSI only, with site boundary reduced to the ISFSI-only OCA in accordance with 10 CFR 72.104 and 72.106.
- All affected environmental permitting amended/approved/closed as required
- Unrestricted release of the non-ISFSI portion of the site (as defined as no more than 25 millirem per year (or such lower standard as may be agreed) plus ALARA)

3.2. Included SSCs and Facilities

Refer to Appendix A.3 for in-scope SSCs and facilities. All SSCs and buildings within the CR3 Protected Area, excluding the ISFSI (except for AA), are within scope. A detailed listing of the SSCs that are in scope for physical decontamination, dismantlement and removal are contained in Reference Appendix A.5. Additionally, Reference Appendix A.3 identifies those buildings and SSCs outside of the power block that are within the Site Restoration scope. Reference drawings contained in Appendix D provide additional details on the SSCs. Note: Site characterization for license termination includes all areas within the defined OCA.

3.3. Excluded SSCs and Facilities

In scope SSCs and facilities are specifically identified in Reference Appendix A.3, all other SSCs and facilities are excluded from scope. These include, but are not limited to:

- ISFSI facility and south berm access road (except for AA)
- Switchyard
- Intake structure
- Discharge structure
- Intake and discharge canals
- Maintenance and Training Facility (MTF)
- Storm Water Ponds and drainage

Note: Site characterization for license termination includes all areas within the defined OCA.

3.4. Expected Initial Condition of Plant

Although subject to change and Bidder notification, the expected condition of CR3 at the time of the D&D activities will be:

- Spent nuclear fuel assemblies stored in the ISFSI.
- The spent fuel pool drained and abandoned, and the fuel storage racks removed from the site.
- Reactor Vessel filled above hot legs with incores inserted and with the head in place.
- AC and DC power removed from the power block with the exception of the power system used in the hot shop, Seawater Room, and minimal plant lighting.
- 12 kV power available to the site; Contractor will be responsible to recover installed plant power distribution systems if required for Contractor's use.
- Permanent plant systems abandoned in place (other than a few select pieces of equipment that have been removed). Any unmaintained site equipment that the Contractor decides to utilize; the Contractor will need to recover for use.
- Note that the steam generators, hot legs, and MSRs were replaced in R16 and have not seen service; with the steam generators and hot legs being previously filled with RCS water and, as such, are contaminated.
- Installed plant cranes (i.e., spent fuel gantry crane, reactor building cranes, turbine building gantry crane, various outbuilding and smaller cranes) abandoned in place; must be recovered by Contractor if required for Contractor's use.
- Radiation monitors abandoned but recoverable; must be recovered by Contractor if required for Contractor's use.
- Offsite Power Transformer (OPT) isolated.
- All razor wire on fencing and within the protected area removed from the site.
- The cable bridge (raceway structure) including cables, conduits, and south block house, just east of the CR3 discharge, removed.
- Overhead 500 kV and 230 kV lines between CR3 and the switchyard removed.

Duke Energy makes no warranty or guarantee as to the condition of any of the plant equipment or systems, or its suitability or recoverability for use by the Contractor during decommissioning.

Containment Structural Status

CR3 performed modifications to stabilize the containment structure to ensure a safe industrial work site and a structure with long-term stability that supports safe handling of fuel and the capability of the Reactor Building Polar Crane. The following modifications were implemented [Ref. Appendix F]:

- EC 90986: Detensioning for Containment Stabilization
- EC 91284: Containment Concrete Stabilization
- EC 91276: Weather Protection

The following "cold and dark" modifications have been or are expected to be made to the plant prior to transfer to the Bidder [Ref. Appendix F]:

- EC 407262, The fire water supply for CR3 during the dormancy phase will consist of a single (existing) Fire Service (FS) water storage tank (FST-1A), connected to aboveground yard mains located on the North, South and West sides of the plant. Private hydrants located approximately every 200 feet in areas accessible by fire department apparatus will be provided on the yard mains in order to provide a gravity fed suction source for those pumpers. The EC to perform the physical work has not been issued. Note: installed abandoned fire detection and suppression systems are recoverable.
- EC 407371, CR3 Dormancy Ventilation - Ventilation of the Auxiliary Building will be accomplished with the addition of three upblast roof-mount exhaust fans mounted above the seawater room, in place of the existing seawater room plugs. Normal operation will consist of two fans in operation, with each fan providing 50% of the design ventilation rate. Air will also be drawn through the Reactor Building, from the Intermediate Building, to minimize stagnant air in those areas as well. Provisions will be provided to allow a radiation monitor to monitor the exhaust airflow, with system design providing sample points for radiation monitoring as desired.
- EC 407372, CR3 Dormancy Electrical - Install a limited power distribution system and associated facilities to support the SAFSTOR2 (Dormancy) Plan:
    - Building Ventilation Fans installed by EC 407371
    - Power for Radiation Monitor for the Building Ventilation Fans air stream
    - Health Physics facilities for access and exit from the CR3 Radiation Controlled Area
    - A switchable low-voltage power source for internal building lighting and portable equipment
    - Facilities for observation of specific internal building areas using a CCTV system
- EC 293487, Circulation Water (CW) Piping Intake and Discharge Closure - Close the Circulation Water (CW) intake and discharge tunnels by pouring concrete down the existing manholes located near the end of the tunnels. The concrete was pumped into "grout" bags fabricated specifically for this intent. CW Intake and Discharge tunnels plugged with 12-foot long, 90-inch diameter concrete plug.
- EC 294476, Fuel Handling Transfer Tube Protection – Provide sand in the RB side deep end. The elevation of the sand is to be about 1 foot below the shallow end floor, Approximately 267 Cu. Yards.

A reconfiguration of the CR3 12 kV system is planned to be implemented that result in the following:

- 12 kV pad-mount switch MTSW-10 (distribution style switchgear) in the old Chemical Storage Building (North berm) will remain in-service connected to the A301 line, with no loads (existing loads disconnected and air gapped). This switch can be tuned OFF but could be turned ON and used by a demolition contractor for bulk North berm power.

- 12 kV pad-mount switch MTSW-8 (distribution style switchgear) on the South berm remains in-service connected to the A301 line, and supplies ISFSI and the new SS2 power system (Hot Machine Shop). Oil-filled transformer MTTR-7 is removed leaving a spare bay in MTSW-8 which could be used by a demolition contractor for bulk South berm power.
- Poles, pole mounted transformers, and the overhead line West of the NAB is removed (no power for NAB or PAB).
- NSOC is powered from the A300 Distribution Line coming down the access road (same line that powers the CCB).
- The CR3 12 kV system from Breaker A301 (A301 Distribution Line) is a CR3 dedicated loop around CR3 (West side) supplying ISFSI and CR3 loads with available (spare bays) bulk 12 kV power on the North and South berm.

3.5. Contractor Performance Requirements

Contractor shall assume responsibility for the work areas and the functions in accordance with the descriptions provided for each area of scope herein, and furnish personnel, facilities, equipment, material, services, and supplies and perform activities necessary to accomplish the work in a safe, efficient, and compliant manner. Contractor shall be responsible for providing project management and subcontractor oversight to enable the safe completion of the work. Contractor shall be responsible for planning and executing the programs, projects and other activities as described in each scope description. Contractor shall maintain a baseline schedule and develop, implement, and maintain a comprehensive cost management system. Decommissioning activities shall follow the requirements as established in Reference Appendix C.2, *Post-Shutdown Decommissioning Activities Report,* and C.3*, Defueled Safety Analysis Report*.

The Contractor shall meet the requirements of this section in accordance with Table 1.0, *Typical DOR for Various Models*, as applicable to the contracting model.

3.5.1. Health and Safety Compliance

The Contractor shall develop and maintain an Industrial Health and Safety program. This programs shall describe accident investigation, reporting, and record keeping, first aid and medical services, Contractor's/ Subcontractors' safety monitoring procedures, safety education procedures, applicable industrial safety and health regulations, emergency procedures, personnel protection, and protective equipment tagging. The Health and Safety program shall, as a minimum, be in accordance with Duke Energy's Safety Program [Ref Appendix E.1] and Contractor Environmental, Health and Safety (EHS) Supplemental Requirements [Ref Appendix E.2]. Please see the Duke Energy Environmental, Health and Safety website for additional information.

Persons employed by the Contractor, Subcontractors, or persons under Contractor's control shall perform work under the direction of the Contractor's Health and Safety program. All persons shall be trained in and be familiar with safety rules and regulations applicable to the work being performed. The Contractor shall have sole responsibility for ensuring that such persons are so informed and that safe work practices are followed.

The Contractor shall designate sufficient qualified Safety Representatives to administer its safety program. The Safety Representatives shall attend applicable Contractor and Duke Energy – CR3 project safety meetings and participate fully in activities outlined in Contractor's safety program. The Contractor's Safety Representatives shall have stop work authority for unsafe acts or conditions, shall be considered key Personnel, and shall be on site at all times when work is performed.

The Contractor shall maintain reports of all accidents and injuries and shall report immediately to Duke Energy - CR3 any accidents occurring at CR3. The Contractor shall develop and maintain Safety Metrics as part of the Safety Program. The Contractor shall hold regularly scheduled meetings to instruct its personnel on safety practices and the requirements of its Safety Program. Safety practices and precautions relating to each activity shall be reviewed as part of the pre-job and turnover briefings.

Prior to performing work on-site, the Contractor shall submit its industrial Health and Safety program for Duke Energy - CR3 approval. The Contractor's Health and Safety program shall, as a minimum, be in accordance with the Duke Energy – CR3 safety program [Ref Appendix E.1] and Contractor Environmental, Health and Safety (EHS) Supplemental Requirements [Ref Appendix E.2]and address the following:

- Safety organization duties and responsibilities
    - The Contractor shall have one full time Safety professional per 100 workers, at the Site during all phases of the work. The resume for the Safety Professional(s) must be reviewed and accepted by Duke Energy.
- Emergency preparedness and notification process for:
    - Fire
    - Serious accidents or death
    - Property damage accidents
    - Requests for first aid
    - Requests for medical assistance from Duke Energy
    - All other accidents
    - Bomb threats
    - Evacuation
    - High wind precautions
- Specific safety requirements/procedures for:
    - Housekeeping requirements
    - Tag-out/lockout clearance program for Contractor equipment
    - Tag-out/lockout clearance program for Duke Energy – CR3 temporary and permanent equipment.
    - Electrical safety hazards including an assured equipment grounding conductor procedure
    - Small tools and shop equipment requirements
    - Welding and cutting requirements
    - Ladders and scaffold safety and tagging requirements

- Personnel protective equipment:
  - Eye protection
  - Head protection
  - Hearing protection
  - Respiratory protection, including silica
  - Comprehensive fall protection
- Crane and rigging safety
- Confined space entry
- Argon Purge Gas Venting
- Vehicles and traffic
- Water hazard requirements
- Heat stress program
- Excavation and trenching requirements
- Safety barricades to include radiation boundaries and radioactive source exclusion areas
- Fire prevention requirements to include combustible loading restrictions and waste minimization
- Fire protection requirements
- Inclement weather protection
- Hurricane protection plan

- The management and disposal of known CR3 asbestos, mercury, and lead containing materials and coatings [Ref. Appendix D.7].

The Contractor shall submit a real time Project Safety and Health report containing significant activities, first aid log, field observations and corrective actions, and any other pertinent information relating to safely and health performance while field activities are ongoing, as applicable to the contracting model.

3.5.2. Environmental Compliance

The Contractor shall comply with all federal, state, and local rules and regulations, as well as the Contractor's Environmental Program. The Contractor's Environmental Program shall, as a minimum, be in accordance with Duke Energy's Environmental program [Ref Appendix E.3], and Duke Energy's rules and guidance documents, which pertain to the removal, handling, packaging, labeling, storage, shipment, and disposal of all wastes, including lead, mercury, and asbestos. This may include Duke Energy approval of Contractor's recyclers.

The Contractor shall have at least one full time Environmental professional at the Site during all phases of the contract work. The resume for the Environmental Professional must be reviewed and accepted by Duke Energy, as applicable for the contracting model.

3.5.3. Radiation Protection Compliance

The Contractor shall comply with all federal, state, and local rules and regulations, as well as the Contractors' Radiation Protection Program, as applicable. The Contractor's Radiation Protection Program shall, as a minimum, be in accordance with Duke Energy's Radiation Protection Program, and Duke Energy's rules and guidance documents, which pertain to the removal, handling, packaging, labeling, storage, shipment, and disposal of all wastes.

CR3's Radiation Protection Program resides within the Radiation Protection Program manual and Health Physics and Radiation Safety Procedures. These procedures describe the programmatic content and operating philosophy of the Radiation Protection Program [Ref Appendix A.10].

3.5.4. Program Management

The Contractor shall develop and maintain the programs as described in Section 5.3.

3.5.5. 10 CFR Part 50 License and Regulatory Affairs

For certain models, the Contractor shall be responsible for all license activities and requirements of 10 CFR Part 50. This includes all requisite programs and requirements that are the remit of the license holder. The Contractor shall prepare, support, and defend any regulatory submissions required to perform work and obtain regulatory closure.

3.5.6. Operations

The Contractor shall perform any operations as necessary in connection with its performance of work unless an operation activity is identified to be a Duke Energy retained activity. These operations are inclusive of operating any SSC (e.g., environmental; chemistry; HVAC; radioactive waste processing, etc.); other support programs; temporary power generators; industrial trucks and equipment; and any other generic workers operating equipment.

3.5.7. Maintenance

The Contractor shall perform necessary maintenance on SSCs and facilities utilized for D&D support, and all other Contractor equipment to ensure their availability.

3.5.8. Site Facilities Management

The Contractor shall manage, operate and maintain the CR3 site and facilities manned by the Contractor. Contractor shall develop and submit a program (e.g., policy, plans, and procedures) to maintain appropriate facilities, property, and assets in place until the facilities are ready for disposition. The Contractor shall establish a program (e.g., policies, plans and procedures) to ensure that SSCs and infrastructure are maintained consistent with their intended use and in compliance with all Applicable Permits and Applicable Laws as necessary until such time as they are planned for demolition, and that third-party property is not affected by activities of the Contractor.

3.5.9. Permitting

The Contractor will identify and acquire any licensing and permitting requirements for D&D. A list of current permits is contained in Appendix B, *HP and Environmental* folder located in the CR3 Document SharePoint site

The CR3 site encompasses 4,738-acres and is characterized by a 4,400-foot minimum exclusion radius centered on the Reactor Building. The current license Owner Controlled Area (OCA) extends beyond the exclusion radius and must be reduced to the ISFSI-only OCA in accordance with 10 CFR 72.104 and 72.106 with license amendment/termination. [Ref Appendix A.2; A.3]

3.5.10. ISFSI Management

Under the LS-2 and AA models where the Contractor manages ISFSI, the Contractor shall ensure the most current applicable rules and regulations, including CR3 site specific regulatory commitments, associated with ISFSI security; emergency planning and other required programs for a dormant plant are followed, and perform those requisite activities. The Contractor shall comply with CR3 ISFSI Technical Specifications and ISFSI 10 CFR 72.212 Report. [Ref. Appendix C.3]

If Duke Energy manages the ISFSI, then the Contractor shall maintain and allow for routine access to the ISFSI pad via the ISFSI sally port as necessary for personnel access and to perform maintenance.

3.5.11. Agreements, Licenses, and Regulatory Commitments

Current CR3 agreements, licenses, and commitments are contained in Appendices B and C. Contractor shall comply with the requirements of said documents, and any additional requirements that may arise from regulator or stakeholder interface that may arise.

3.5.12. CR3 Interface and Interference with Other CREC Plants

The Contractor shall be responsible for maintaining the CR3 interface with other CREC plants. There shall be no impact to the facilities or operations of the other CREC plants. The contractor will be held responsible for any impact to Duke Energy, including any financial impact.

AI-1300, "Engineering, Maintenance and Support Interfaces," is a CR3 document which contains descriptions of the numerous interactions between CR3 and other Company organizations. [Ref Appendix A.4] It also defines the scope of the interfacing activities. The document is for use by organizations who perform activities which may affect the licensing/design basis of CR3 to identify those activities requiring the knowledge and participation of Nuclear Operations. A brief discussion of some of the interfaces follows: (NOTE: AI-1300 is under revision to remove references to Fire Service and Demineralized Water)

- Well Water System

  Well water to Units 1, 2, and 3 is furnished from a common system. Units 4 and 5 are on separate wells. The maintenance and operation of the Units 1, 2, and 3 system is under the supervision and direction of the Fossil Plant Superintendent. There may be limits on the amount of well water available.

- Intake And Discharge Canals

  The intake and discharge canals are common between Units 1 and 2, 4 and 5, the Combined Cycle Plants, and the nuclear unit. Maintenance of the canals is the responsibility of the Crystal River Fossil Operations.

3.5.13. Project Management Requirements and Expectations

Project Management requirements and expectations, particularly with regards to project control requirements and project metrics reporting, will vary depending on the contracting model selected. Specific requirements will be developed during the Due Diligence Period, however, as a minimum, the Contractor shall provide requisite reports that will allow Duke Energy to adequately assess Contractor cost and schedule performance. The Contractor shall:

- Provide an effective organization that will serve Duke Energy's best interest,
- Provide overall Project Manager and staff required to support project execution requirements for the contracting model selected,
- Maintain a baseline schedule,
- Develop, implement, and maintain a comprehensive cost management system,
- Develop and publish performance metrics that may include: planned vs. actual activities; dose actual vs. planned; milestone status baseline vs. actual; SPI; CPI; commodity curves; burn rates; staffing levels baseline vs. actuals; project performance indicators for safety, environmental quality, schedule, engineering, and cost metrics; and other KPIs as necessary.
- Provide accounts payable and accounts receivable information for the DGC and LS models.

The Contractor shall provide schedule and cost estimates with their bid as described elsewhere in this RFP.

4. FACILITY DECOMMISSIONING

4.1. Phase 1: D&D Planning

The Contractor shall develop the following documents as applicable for each contract model per Table 1.0, *Typical DOR for Various Models*: (Duke Energy will review and approve as applicable for the model)

4.1.1. Transition Plan

To facilitate the transfer of responsibilities and assumption duties, the Contractor shall develop a comprehensive Transition Plan (TP). The TP shall include:

- A section describing each function Duke Energy will transfer to the Contractor, Contractor's plan to assume responsibility for performance of the function, a DOR document for each transfer, and a list of prerequisite processes and procedures;
- A process for obtaining required permits and licenses;
- Interface agreements with CREC, and external stakeholders;
- A "readiness review" process to validate that the Contractor is prepared to accept transfer of responsibilities and assumption of duties;
- A Level 3 schedule showing the development, review and approval for each program whose responsibility is transferred to the Contractor.

4.1.2. License Termination Plan

The Contractor shall develop a comprehensive License Termination Plan (LTP), and shall detail the activities, actions, dependencies, documents, and schedule to support the license termination (amendment) to ISFSI only, assuming spent nuclear fuel and HLW is not picked up by the DOE earlier, and final license termination under the AA contracting model.

4.1.3. Site Restoration Plan

The Contractor shall develop a comprehensive Site Restoration Plan (SRP), and shall detail the activities, actions, dependencies, documents, and schedule to support the site restoration, including ISFSI under the AA contracting model.

Included in the SRP is a Landscaping Plan that details the drainage, planting, walkways, roads, and fencing.

4.1.4. Site Security Plan

If necessary for the selected model, the Contractor shall develop a comprehensive Site Security Plan, including a Safeguards Program, for both nuclear and asset protection.

The Site Security Plan shall detail the activities, actions, dependencies, documents, and schedule to support the management, administration and implementation of the security program.

4.1.5. Waste Management Program

Contractor shall establish a Waste Management Program that includes policies, plans, and procedures. The Waste Management Program shall detail the activities, actions, dependencies, documents, and schedule to support the license amendment to ISFSI only (assuming spent nuclear fuel and HLW is not

picked up by the DOE earlier) and final license termination under the AA contracting model, and shall include:

- The technical approach to waste planning, characterization, handling, packaging, shipping, salvaging process, including identification of salvageable materials, and required inspections and permits,
- Policy addressing management of all waste streams,
- Waste stream quantity and disposition estimates over time,
- Personnel requirement,
- Reporting requirements,
- Records management process,
- Implementation schedule.

Duke Energy shall review and approve the Waste Management Program, and retains the right to approve all waste disposal facilities the Contractor utilizes. The Waste Management Program shall be approved by CR3 prior to performing waste-generating activities. Evidence package demonstrating waste disposal activities are deliver to Duke Energy in a timely manner after Contractor receives Certificates of Disposal or as documented in approved records management process for the Waste Management Program.

The Waste Management Program shall include plans and procedures for the following waste streams/types:

4.1.5.1. Effluent Disposition

The Contractor shall be responsible for the processing and disposition of any effluent at CR3 in accordance with the Waste Management Program. This includes the proper categorizing and disposing of all effluents in accordance with applicable laws and permits. The Contractor shall ensure that all long-range planning includes maintaining a viable effluent release path as necessary.

4.1.5.2. Non-Radioactive Non-Hazardous Waste

The Contractor shall be responsible for the processing and disposition of any non-radioactive non-hazardous waste generated at or otherwise existing at CR3 in accordance with the Waste Management Program. This includes the proper disposing of all non-radioactive non-hazardous waste in accordance with applicable laws and permits.

4.1.5.3. Non-Radioactive Hazardous and Industrial Waste

The Contractor shall be responsible for the processing and disposition of any non-radioactive hazardous and industrial waste generated at or otherwise existing at CR3 in accordance with the Waste Management Program. This includes the proper disposing of all non-radioactive non-hazardous waste in

accordance with applicable laws and permits, including the management and disposal of PCP, PCBs, asbestos, mercury, and lead containing materials and coatings [Ref. Appendix D.7].

4.1.5.4. Low-Level Radioactive Waste Class A, B, and C

The Contractor shall classify and treat Class A, B, and C waste (including mixed waste) whether existing at CR3 or generated by the work, in accordance with the Waste Management Program. Class A, B, and C waste shall be removed and disposed of offsite at properly licensed waste processing or disposal facilities.

4.1.5.5. High Level Waste (HLW)

The Contractor shall characterize, process, package, and load HLW, including but not limited to GTCC, into storage containers that shall be stored in the ISFSI facility. The Contractor shall evaluate said storage, including structural and 72.48 and 50.59 evaluations as required, and ensure compliance with all required laws and regulations. The Contractor shall schedule the delivery of HLW storage containers and support equipment (e.g., shielded transfer casks) in sufficient time to support the work schedule. Contractor shall develop and maintain HLW waste quantity and disposition estimates and schedule projections and ensure that a sufficient number of storage containers are scheduled for delivery in time to support the work.

4.1.5.6. Transportation and Permitting

The Contractor shall be responsible for the permitting and transportation of waste streams in accordance with all applicable laws, regulations, and permits.

4.2. Phase 2: Physical D&D

4.2.1. D&D Activities

The Contractor shall remove SSCs and further reduce residual radioactivity to levels that permit release of the property for unrestricted future use and amendment/termination of the NRC license and as necessary to meet other applicable requirements. Example activities include:

- Provide temporary utilities including electricity and ventilation to work areas
- Segment the reactor vessel internals and packaging for shipment and disposal including loading those portions that are HLW waste into storage canisters Note: the contractor shall minimize the volume of HLW waste requiring packaging into dry storage containers
- Removing and disposing of large components including reactor vessel, steam generators, pressurizer, turbine generator
- Decontaminating and removing SSCs listed in Ref Appendix A.5
- Decontaminating and removing the approximately 1000’ of Nitrogen supply line to the abandoned hydrogen farm

- Decontaminating and restoration of the West Settling Pond including decontaminating and removing Station Drain Tank Line that feeds the pond, and the pond discharge line
- Removal of CREC site interties (demineralized water, fire water, waste & sewage)

4.2.2. Hazardous and Non Hazardous Waste Management

The Contractor shall be responsible for waste management and compliance with applicable laws permits, and provide qualified staff, materials, and equipment for handling such waste, to include:

- Developing and submitting written processes for waste management activities.
- The management and disposal of known and unknown CR3 PCP, PCBs, asbestos, mercury, and lead containing materials and coatings [Ref. Appendix B.1.1].
- Efficiently segregating waste to the lowest waste profile acceptable for disposal to optimize the packaging, transportation, and disposal costs.
- Characterizing, packaging, transporting, processing, and disposing of waste, including establishing and managing subcontracts for same.
- Operation and maintenance of any required effluent system(s).
- Processing and disposition of liquids either as found at CR3 or as generated during performance of work.
- Providing waste transportation and disposal documentation and approvals.
- Obtaining Duke Energy's approval and signature for rad waste shipments as required.
- Developing and maintaining waste quantity estimates and disposal schedule projections.
- Characterizing and packaging waste in accordance with the contractor's or existing CR3 procedures, processes, and practices, as applicable.
- Ensuring that waste carriers have and maintain valid permits required for transportation of waste.
- Shipping and disposal of waste.
- Preparation of necessary shipping documents and manifests.
- Ensuring that waste is accepted, treated, and disposed at only facilities with valid permits and operating in compliance with applicable laws and permits.
- Delivering documentation packages to Duke Energy demonstrating waste disposal activities are complete one (1) week after receipt of Certificates of Disposal or as documented in approved records management process for the Waste Management Program.

Contractor may recycle, reclaim or otherwise salvage materials that meet the "free release" criteria established at CR3. Contractor shall implement a process for this verification and maintain documentation of same. Any and all value obtained for salvaged or scrapped materials remain with the Contractor.

4.3. Phase 3: License Termination and Site Restoration

This RFP Section corresponds to D&D Work Phase 3: License Termination and Site Restoration

4.3.1. License Termination Requirements

It is unknown at this time when the spent nuclear fuel and HLW stored in ISFSI will be completely removed by the DOE; this activity is a prerequisite to final license termination (Bidders may assume 2037 for cost estimating purposes). The Contractor shall be responsible for the outcome, i.e., license amendment to ISFSI only or complete license termination, as applicable to the contracting model chosen. The Contractor shall include the details in the LTP.

4.3.2. Site Characterization for License Termination

The Contractor shall be solely responsible to complete site characterization as required to satisfy the license amendment/final termination. The current site boundary, defined as the Owner Controlled Area (OCA), encompasses 4,738 acres [Ref. Appendix A.2] and shall be reduced in accordance with 10 CFR 72.104 and 72.106.

The Contractor shall perform characterization activities to support the license amendment/final termination. This site characterization must be performed in accordance with the guidelines in NUREG-1575 Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM); in NUREG-1757 Consolidated Decommissioning Guidance, Characterization, Survey, and Determination of Radiological Criteria, Volume 2, Revision 1; and in American Society of Testing and Materials Standard E 1281, Nuclear Facilities Decommissioning Plans, to demonstrate compliance with 10 CFR Part 20, Subpart E, Radiological Criteria for License Termination, regulations and standards leading to license amendment/termination.

The Contractor shall provide any updates to the HSA, and the final HSA to Duke Energy.

4.3.3. Radiological Criteria for License Termination

NRC Subpart E, “Radiological Criteria for License Termination,” which amended 10 CFR Part 20, provides radiological criteria for releasing a facility for unrestricted use. The regulation states that the site can be released for unrestricted use if radioactivity levels are such that the average member of a critical group would not receive a Total Effective Dose Equivalent (TEDE) in excess of 25 millirem per year (or such lower standards as may be agreed) from all sources, taking into account the up to 4 millirem per year limit for drinking water (or such lower standards as may be agreed), provided that residual radioactivity has been reduced to levels that are As Low As Reasonably Achievable (ALARA). The site will be remediated to the levels specified in 10 CFR 20.1402, “Radiological criteria for unrestricted use,” and all other state and local requirements, with remediation measures sufficient to result in substantially lower levels than required by the foregoing regulations.

The NRC will terminate or amend the site license if it determines that site remediation has been performed in accordance with the LTP, and that the terminal radiation survey and associated documentation demonstrate that the facility is suitable for release.

4.3.4. Site Restoration Requirements

The Contractor shall follow all applicable laws, regulations, local building codes and state environmental regulations during site restoration. Any and all value obtained for salvaged or scrapped materials remain with the Contractor.

The Contractor shall prepare the Site Restoration Plan (SRP) to specify the materials and processes used for backfill of lower elevations, i.e., concrete rubble generated from demolition activities, other clean backfill, etc. The SRP shall also specify what construction debris is trucked off site as an alternative to onsite disposal. The excavations will be regraded such that the power block area will have a final contour consistent with adjacent surroundings, and permits the growth of vegetation to prevent erosion, as required by the regulatory closure requirements. Site restoration is to include ISFSI under the AA contracting model.

The detailed Contractor scope for site restoration includes [Ref. Appendix A.3; A.5]:

- All SSCs removed and all system interties to other CREC plants isolated and/or removed (physical D&D scope complete) (including ISFSI under the AA contracting model)
- All designated buildings, structures, and pavement/asphalt removed
- Sufficient safe pathways remain or are installed within the areas disturbed during the decommissioning process, for access to/from ISFSI facility, parking lots, and other CREC facilities as applicable.
- As-built site condition established with environmental and long-term safety considerations incorporated
- Within the power block (all areas at berm elevation 119'):
    - The entire area cleared to a minimum of three (3) feet below grade level (defined as plant elevation of 119', i.e., the berm remains)
    - All pipes, cable, wiring, and equipment removed from all elevations of buildings and structures (only concrete and required structural steel remains)
    - Water drain holes will be drilled in the bottom of all below grade structures to be abandoned by burial
    - Pipe chases, electrical duct banks, vertical pump structures, and sumps will be backfilled with a suitable earthen material and abandoned.
    - Non-contaminated (radiologically or otherwise) underground piping greater than 3 feet below grade (except the intake and discharge raw/circulating water piping) will be evaluated for removal, abandonment, or filling to eliminate the potential for collapse after the site is released for unrestricted use.

  - The intake and discharge raw/circulating water piping will be either removed, collapsed and backfilled, or filled to eliminate the potential for collapse after the site is released for unrestricted use.
  - Affected areas backfilled to grade with gravel and sufficient topsoil to support erosion control vegetation growth, and sodded/seeded
- Outside of the power block (all areas not at berm elevation 119'):
  - areas made permeable to existing grade
- Firing range remediated as follows:
  - removal of soil containing lead residue
  - buildings and structures removed
  - pavement/asphalt removed
  - areas made permeable to existing grade
  - utilities (electric, water) removed
  - septic tank and leach field removed or sanitized, crushed and backfilled as required per regulations and permits
- West settlement pond remediated as follows:
  - Water removed and processed per regulatory requirements
  - Liner removed
  - Any contaminated soil removed per regulatory requirements
  - Influent and effluent piping removed
  - Backfilled to grade with sufficient topsoil to support erosion control vegetation growth, and sodded/seeded
- If Duke Energy is managing the ISFSI, then access to/from the ISFSI pad via the existing ISFSI sally port and haul path is maintained
- NRC license terminated to:
  - ISFSI only, with site boundary reduced to the ISFSI-only OCA in accordance with 10 CFR 72.104 and 72.106
  - AND to include final license termination for ISFSI under the AA contracting model
- All affected environmental permitting amended/approved/closed as required with:
  - ISFSI storm water control and ponds left unabated (until ISFSI decommissioning under the AA contracting model)
  - Final site storm water control system designed and implemented
- Unrestricted release (as defined as no more than 25 millirem per year (or such lower standard as may be agreed) plus ALARA) of the site (including ISFSI under the AA contracting model)
- Developing and delivering to Owner, a Final Site Survey and Condition (as-built) document

5. BIDDER TECHNICAL RESPONSES

5.1. Project Timeline

Bidder shall provide a project timeline that includes the following major periods, by contracting model:

- Due Diligence (Stage Two)
- Regulatory Approvals
- Transition Planning
- D&D
- Partial License Termination
- Site Restoration
- Spent nuclear fuel and HLW is removed
- ISFSI D&D
- Final License Termination
- Final Site Restoration

5.2. Technical Approach and Statement of Qualifications

Bidders shall provide a comprehensive, written narrative to document the proposed approach, contracting model, methods, tools, project team, governance (roles, responsibilities, accountabilities for performance and risk ownership), as well as the Bidder's experience and qualifications in performing each of the major scope areas described below.

5.2.1. D&D Due Diligence

Provide an overview of the proposed approach and schedule to conduct D&D Due Diligence of the CR3 Accelerated Decommissioning Project. Overview shall include the Bidder's approach, methods, project plan, testing/sampling/surveying tools and means, organization structure and identification of necessary access to site, personnel and information/data.

5.2.2. Reactor Vessel and Internals Segmentation and Storage of HLW

Include an overview of the Reactor Vessel (RV) and Reactor Vessel Internals (RVI) segmentation plan, sequence, proposed tools, use of subcontractors, project organization, and approach to minimizing Class B, Class C and HLW waste. Detail the responsibilities and integration with interfacing with the ISFSI operations.

5.2.3. Removal and Disposal of Large Components

Provide overview of the proposed approach for removal and disposal of large components, such as reactor pressure vessel, steam generators, turbines, pressurizer, reactor coolant pumps, etc. Include the methodology, tools and means for removing, packaging, permitting, and transporting of oversized/overweight components, along with the disposal plan.

5.2.4. Waste Packaging, Staging, Transportation and Disposal.

Provide an overview of the proposed approach, methods, tools and means for waste management (staging, packaging, blending, transportation, and disposal). This should include container receipt, interim storage, spoils, rubble and debris. The sequencing of the demolition of site facilities should be considered. Identify how and where waste will be staged and transported from the CR3 site and describe on-site facilities that will be employed.

5.2.5. Water Processing

Provide an overview of the proposed approach, methods, tools and means for addressing the processing of contaminated water, and subsequent decontamination and dismantling of applicable water processing systems. The overview shall contain the recommended approach to effluent disposition, including permitting, management, and waste dispositioning.

5.2.6. Site Equipment

Provide a list of site equipment that it intends to use in the performance of the work and alternatives available to the Contractor if the site equipment is not able to be recovered for the intended use.

5.2.7. ISFSI Operations

Provide recommended approach as to the Contractor or the Company to operate and maintain the ISFSI, provide security for the ISFSI and continue to perform other security functions at the CR-3 Site. If proposing to take responsibility for the ISFSI, detail the approach, methods, organization, and means for operating and maintaining the ISFSI site. If operations of the ISFSI are not in scope, detail how the approach integrates with the Company's ISFSI management. This should include space management, logistics, and coordination of D&D activities and any constraints with the ISFSI that may impact the Bidder's scope and schedule.

5.2.8. Site and Nuclear Security

Provide an overview of the nuclear security scope, approach and responsibilities for the Bidder to either provide site and nuclear security or integrating with the existing nuclear security operations. Note the Nuclear Security Operations protective area has been limited at the CR3 site to the ISFSI. If assuming responsibility for site and nuclear security operations, discuss the approach, methods, organization, governance for managing the protected area/vital area access, security for the demolition site, coordination and adequate notice with Crystal River Energy Complex security, cyber security programs and other associated programs.

5.2.9. Removal of All Sub-Surface Structures, Systems and Components (SSC)

Provide an overview of Bidder's approach, methods, tools, means, and organization for the removal of all sub surface SSCs to below the three foot grade level. Explain the regulatory, license, permit and easement requirements for reuse of backfill.

5.2.10. Decontamination and Dismantlement (D&D) of Major Structures

Provide an overview of Bidder's approach, methods, tools, means, and organization for the removal of all major SSCs as well as the potential coordination of any CR1 and CR2 Unit demolition activities. Approach should discuss creating and enlarging openings in structures, recommendations and rationale for any open air D&D activities, demolition methods and sequencing.

5.2.11. License Transfer and License Termination

Provide an overview of Bidder's approach, methods, tools, means and organization to obtain NRC approval of required license transfers (if appropriate to the contracting model) and license termination to reduce the NRC licensed area (including ISFSI under the AA contracting model) and release all of the other land from the NRC license.

5.2.12. Site Restoration

Provide an overview of Bidder's approach, methods, tools, means, and organization for site restoration. This should include a discussion of regulatory engagement, license termination activities and responsibilities, environmental permitting, etc. Explain the regulatory, license, permit and easement requirements for reuse of backfill.

5.3. Technical Questionnaire of Program Management

The Bidder shall develop and implement management systems that are acceptable to the Company and compliant with applicable laws and applicable permits to govern, manage and execute the work. To clarify the scope and responsibilities of the Bidder, for each sub-section enumerated below, the Bidders are required to provide: 1) a summary of their current capabilities; 2) discuss if applicable programs exist or will have to be developed; and, 3) provide the Bidders' detailed approach for establishing each of these management systems. Bidders may consult Table 1.0, *Typical DOR for Various Models,* for anticipated expectations associated with each contracting model.

Note the program elements listed below are not intended to be exhaustive. The programs are expected to be modified by the Bidder as the work progresses. The Bidder is responsible for ensuring work includes the elements necessary to meet the requirements of applicable laws and permits.

- Occupational Safety and Health
- Radiological Protection
- Emergency Preparedness

- Quality Program
- Engineering
- Environmental
- Chemistry
- Fire Protection
- Utilities
- Maintenance
- Nuclear Oversight
- Safety Culture
- Operations
- Corrective Actions
- Security
- Nuclear Security
- Site License and Nuclear Regulatory Affairs
- Site Support Services
- Training
- Work Control
- Business Systems

6. RFP COMMERCIAL QUESTIONNAIRE

Note: Bidders are to submit responses in Attachments 1 through 10 in the native Excel file format, with all formulas functional. Attachments 1 through 10 are contained in the Excel file provided, Attachments 11 through 14 are individual files.

6.1. Supplier Profile Questionnaire

Bidders are required to submit ***Attachment 1*** to document information pertaining to the Bidder's Company structure, designated RFP contact, financial information and customer reference details. In addition, Bidders are requested to provide the most recent two years of audited financial statements (Income Statement, Balance Sheet, and Cash Flow Statements) with footnote details; as well as, letter from Bonding Agent and documentation of Insurance coverage certification.

6.2. Project Organization Structure and Key Personnel

Bidders shall provide proposed organizational structure charts for each phase of the D&D project; 1) Project Mobilization and Planning; 2) D&D Work Activities; and 3) Site Restoration and License Termination. Additionally, Bidder shall identify (name) key personnel and provide proposed key personnel resume's and D&D project references.

6.3. Safety Performance and Rating

Bidders shall register with Company's Safety Performance rating program through Avetta. Bidders and proposed sub-contractors shall complete ***Attachment 2***, Safety Performance Metrics template to document safety performance metrics. For safety registration instructions and safety requirements, please access the Duke Energy Environmental, Health and Safety website.

6.4. Nuclear Project Lessons Learned

Bidders are requested to provide a listing of the significant lessons learned from previous Nuclear Power Reactor projects utilizing the Lessons Learned template provided as ***Attachment 3.*** A discussion of how lessons are incorporated into the Bidder's approach and scope for D&D services at CR3 should be provided.

6.5. Risk Register

Bidders shall provide a comprehensive risk register for the CR3 D&D project, utilizing the template provided as ***Attachment 4***. Risks should be categorized and qualified per the Attachment 4 instructions detailing potential risk impact and probability. Additionally, risks mitigation steps and ownership should be identified for each risk listed.

6.6. Decommissioning Cost Estimate

Bidders shall submit a fixed price decommissioning cost estimate aligning to CR3 Decommissioning Cost Estimate Work Breakdown Structure (WBS), utilizing template provided in ***Attachment 5***.

6.7. WBS Milestone Plan

Bidders shall document project milestones associated with the performance of work and aligned with milestone payments for work completion and release of payments from the Nuclear Decommissioning Trust Fund. The proposed milestone plan must be cross referenced with the Decommissioning Cost Estimate WBS provided. Bidders are requested to propose a minimum of four milestones for each calendar year of the work performed in decommissioning. ***Attachment 6*** is to be submitted to document the milestone plan.

6.8. Annual Cash Flow Statement

Bidders shall provide a cash flow model of the D&D Project. The model will include annual project cash disbursements and operating costs against the Nuclear Decommissioning Trust Fund with assumed growth rates, escalations, performance assurance costs, and reimbursements associated with the work breakdown structure over the life of the project. ***Attachment 7*** is to be submitted to document the Annual Cash Flow Statement.

Providing that the Bidder is proposing to control and manage the NDT fund, Bidders shall provide a narrative of their plan for the management and control of the NDT, to include: 1) NDT investment strategy; 2) assumed growth rate; 3) controls and process for NDT drawdowns.

Note: DEF shall holdback portions of the NDT for taxes and owner costs as applicable.

6.9. Sub-Contracting Plan

Bidders shall submit the Sub-Contracting Plan utilizing the template provided in ***Attachment 8***. A Sub-Contracting Plan is required for all work scopes estimated to be over $700K. The template identifies the sub-contractor, work scope, estimated sub-contracting expense, supplier diversity classification, and local community economic impact. Bidders shall provide the experience and capabilities of each identified sub-contractor.

6.10. Waste Disposal Pricing

Bidders shall submit ***Attachment 9***, Waste Disposal Pricing template to provide an estimate for waste disposal and transportation costs. Template includes assumptions for estimated weights, volumes by class of waste, transportation and disposal costs.

6.11. Performance/Financial Assurance

Bidders shall provide their proposed approach for performance/financial assurance of the work scope. ***Attachment 10*** is provided to capture the estimated costs associated with recommended performance/financial assurance utilities, such as performance bonds, letters of credit, parent guaranty, performance insurance, or other forms of credit enhancement, etc.

6.12. Term Sheet - Key Terms

Bidders are requested to review ***Attachments 11-14***, CR3 Decommissioning Term Sheets and submit a red line of the one Term Sheet for the contracting model most closely aligned with the Bidder's proposal. The Term Sheet redline should include a listing of any exceptions, exclusions, and inclusions for each key term clause. If a Bidder submits an Alternative proposal, the Bidder should mark-up additional Term Sheets for the contracting model most closely aligned with the Alternative proposal.

6.13. Due Diligence Process

Bidders shall provide their plans, details, requirements, and schedule for performing their due diligence (Stage Two) with their proposal.

7. Attachment Index

The following Attachments are included in excel file *CR3 Accelerated Decommissioning Project RFP Submittal Attachments*, included in Power Advocate.

- Attachment 1 – Supplier Profile Questionnaire
- Attachment 2 – Project Organization Structure and Key Personnel
- Attachment 3 – Safety Performance and Rating
- Attachment 4 – Nuclear Project Lessons Learned
- Attachment 5 – Risk Register
- Attachment 6 – Decommissioning Cost Estimate
- Attachment 7 – WBS Milestone Plan
- Attachment 8 – Annual Cash Flow Statement
- Attachment 9 – Sub Contracting Plan
- Attachment 10 – Waste Disposal Pricing
- Attachment 11 – Performance/Financial Assurance
- Attachment 12 – Term Sheet – Key Terms

8. CR3 Document Library Index

The CR3 Accelerated Decommissioning Project team has assembled documents to support the Bidders evaluation of the site conditions and scope of work. These documents are located in the CR3 Document Library on the SharePoint site, and organized into Appendices as follows:

A. General
   - A.1 TLG decommissioning estimate 2018
   - A.2 2017_CR3 OCA_rv
   - A.3 CR3 Layout with legend
   - A.4 AI1300-R036
   - A.5 List of Systems
   - A.6 2017 Financial Status Report-As Filed
   - A.7 2017 ISFSI Decomm Report – ML17135A230
   - A.8 RG1.179
   - A.9 RG1.184
   - A.10 CR3 Controlled Documents_Procedures Category as of 4-3-18

B. HP and Environmental
   - B.1 Historical Site Assessment HAS
   - B.2 50.75g site procedure, plan, records and spill history
   - B.3 Air Operation Permit
   - B.4 Ground water monitoring
   - B.5 NPDES
   - B.6 ODCM

- B.7 Power History
- B.8 REMP
- B.9 RETS
- B.10 Storm Water
- B.11 FDEP CoC

C. Licensing
- C.1 CR3 PSDAR
- C.2 DSAR_R001
- C.3 ISFS-212 ISFSI 10 CFR 72.212 Report
- C.4 Defueled Tech Specs DSTS

D. Drawings
- D.1 Architectural-Layout
  - D.1-1 0XX Layouts
  - D.1-2 CR3-A Architectural (FPC)
- D.2 Mechanical, I&C, Piping, Building SVC
  - D.2-1 304 Physical Piping
  - D.2-2 311 Building Service Physicals
  - D.2-3 312 Tanks, Miscellaneous
- D.3 Structural Concrete
  - D.3-1 403 Turbine Building Mat., CC Walls
  - D.3-2 405 Turbine Building and CC Floors
  - D.3-3 408 XFMRS and Miscellaneous Turb. Bldg. Equip. FDNS
  - D.3-4 409 Turbine Generator Foundation
  - D.3-5 416 Elec. Manholes, Incl. TSC
  - D.3-6 421-0XX Reactor Building Concrete
  - D.3-7 421-1XX Auxiliary Building North Concrete
  - D.3-8 421-2XX Intermediate Building Concrete
  - D.3-9 421-3XX Ring Girder and Dome
  - D.3-10 422 Auxiliary Building South Concrete
  - D.3-11 426 CW Intake and Discharge, RW Anchors
  - D.3-12 434 Outside Building and Foundations
  - D.3-13 447 Foundation for Cable Support Bridge
- D.4 Structural Steel
  - D.4-1 502 Turbine Blg. And CC Steel, CC HVAC Supports
  - D.4-2 506 Heater Bay Steel
  - D.4-3 521-0XX Reactor Building Steel
  - D.4-4 521-1XX Auxiliary Building North Steel Intermediate
  - D.4-5 521-2XX Building Steel
  - D.4-6 522 Auxiliary Building South Steel
  - D.4-7 526 CW Intake and Discharge Steel

- D.4-8 534 Outside Building Steel
- D.4-9 547 Cable Bridge Over Discharge Canal
- D.5 Civil
  - D.5-1 736 Plot Plan
  - D.5-2 743 Storm Drainage
  - D.5-3 744 Miscellaneous Civil
  - D.5-4 CR3-G Plot Plan (FPC)
- D.6 Reactor Vessel
- D.7 Asbestos Information
  - D.7-1 214-061-SH000
  - D.7-2 AI1810
  - D.7-3 SP5953

E. Safety
- E.1 2017 Health and Safety Handbook
- E.2 STPD-SAF-PMC-00002-005, Contractor Environmental, Health and Safety (EHS) Supplemental Requirements
- E.3 2018 Environmental Handbook

F. Cold and Dark Engineering Changes
- F.1 Implemented EC's
  - F.1-1 EC 293487 – Circulation Water Piping Intake-Discharge Closure
  - F.1-2 EC 294476 - Fuel Handling Transfer Tube Protection
  - F.1-3 EC 407270 - FP Transition to Decommissioning
  - F.1-4 EC 407371 - CR3 Dormancy Ventilation
  - F.1-5 EC 407372 - CR3 Dormancy Electrical

Contractor Safety Ratings

Duke Energy leverages Avetta as our contractor safety certification process partner. Avetta, a third-party administrator and information verification company, will collect, verify and maintain contractor prequalification-related information to streamline Duke Energy's contractor safety rating process.

Partnering with Avetta enables our contractors to:

- Electronically share regulatory forms, EHS performance metrics, internal policies and procedures, certifications, manuals and other documents
- Leverage content to close gaps in compliance-related program and procedure documents
- Auto-populate applications and bid requests within existing and verified companies

RFP Instructions

Please access the Avetta registration portal through http://pages.avetta.com/DUKE-ENERGY .

Already Have an Avetta Account?

If your company already participates in Avetta, please ensure you associate your company's Avetta account to Duke Energy's and select the appropriate business unit within Duke Energy. Also, please ensure the information in your Avetta account is current. If so, there is no further action.

Don't Have an Avetta Account?

If your company does not participate in Avetta, there is a module called "QuickVett" that allows contractors to participate in bid events without completing the entire Avetta organizer. This process provides Duke Energy with basic safety-related information needed to verify safety targets required to work for Duke Energy. Upon award, you will be required to participate in the Avetta modules which will provide a Duke Energy safety rating and evaluation of your company's OSHA compliance programs.

To access the QuickVett module, answer "Yes" to "Are you a QuickVett or bid only supplier?" when completing the Pre-Qualification Form (PQF) in Avetta.

Registration / Pre-Qualification

Registration

- Each contractor and subcontractor must register on the Avetta website using the link above.

Pre-Qualification

- Complete the Prequalification Form (PQF) – Once you have registered and aligned your company with Duke Energy, you may begin the prequalification process by completing and submitting the PQF and Annual Update information online.
- Respond to any audit questions - After submitting your PQF and required documentation online to Avetta, an Avetta representative will contact you to review your submission. Your dedicated Avetta representative will work with you to collect missing information to ensure you achieve green flag status for Duke Energy.

Qualification Deadline

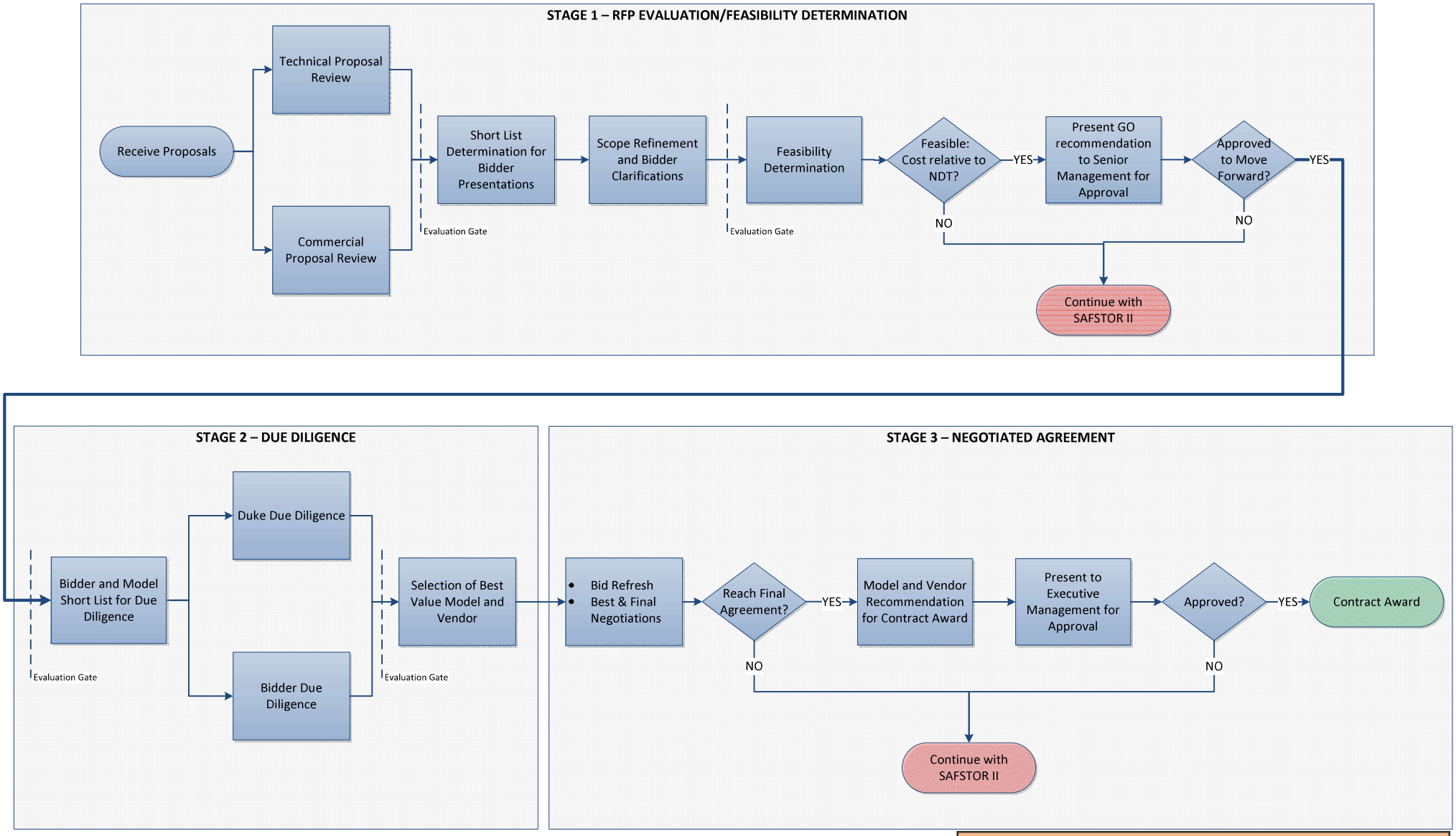
- Once you have achieved Complete status, your company will be rated as compliant in Avetta Organizer and available for contract work with Duke Energy and other clients within the exclusive Avetta network.

For questions specific to the RFP, utilize PowerAvocate messaging to contact the bid team.

To contact an Avetta representative, please call (877) 725-3022.

CR3 Accelerated Decommissioning Proposal Evaluation Process

Overview



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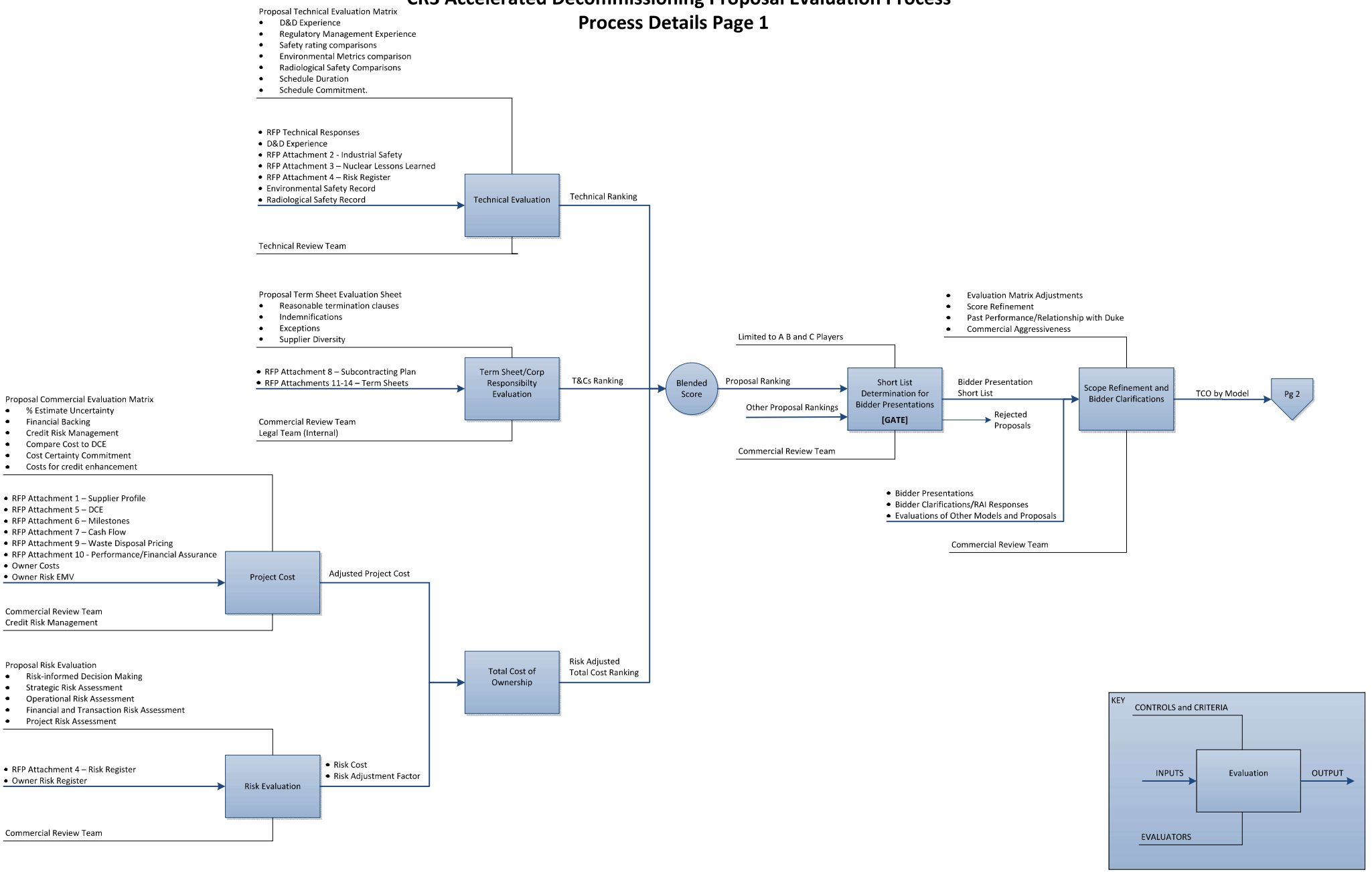
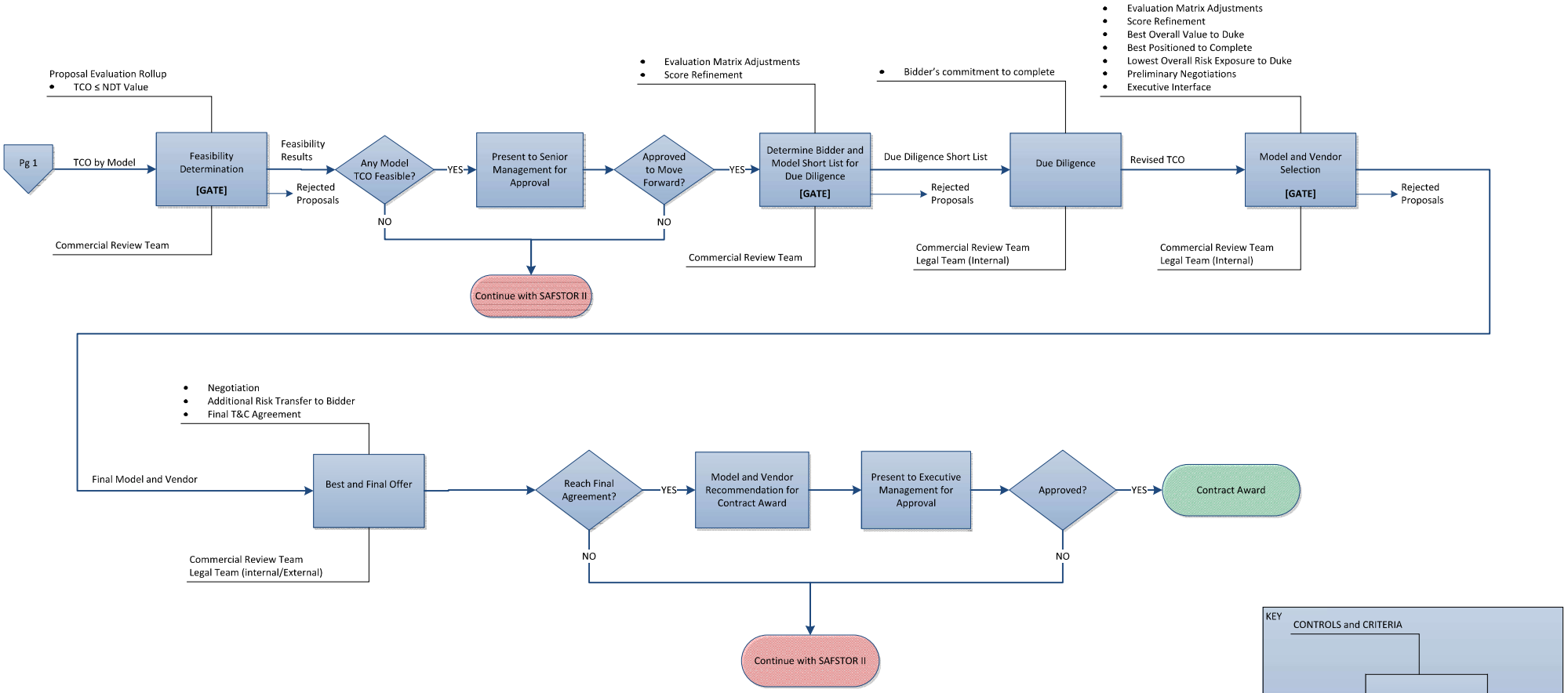
CR3 Accelerated Decommissioning Proposal Evaluation Process
Process Details Page 1



CR3 Accelerated Decommissioning Proposal Evaluation Process
Process Details Page 2



GDS Associates, Inc
ENGINEERS & CONSULTANTS

Richard A. Polich, P.E.

Managing Director – Power Supply Services

EDUCATION

Master of Business Administration, University of Michigan, 1990
Bachelor of Science, Mechanical Engineering, University of Michigan, 1979
Bachelor of Science, Nuclear Engineering, University of Michigan, 1979

ENGINEERING REGISTRATION

Professional Engineer in the State of Michigan

PROFESSIONAL MEMBERSHIP

National Society of Professional Engineers
American Nuclear Society
American Society of Mechanical Engineers

PROFESSIONAL EXPERIENCE

Mr. Polich has more than 30 years' experience as an energy industry engineer, manager, and leader, combining his business and technical expertise in the management of governmental, industrial and utility projects. He has worked extensively in nuclear, coal, IGCC, natural gas, green/renewable generation. Mr. Polich has developed generation projects in wind, solar, and biomass in Australia, Canada, Caribbean, South American and United States. His generation experience includes engineering of systems and providing engineering support of plant operations. Notable projects include the Midland Nuclear Project and its conversion to natural gas combined cycle, start-up testing support for Consumers' coal-fired Campbell 3, Palisades nuclear steam generator replacement support, Covert Generating Station feasibility evaluation, and a Lake Erie offshore wind project. He also has extensive experience in utility rates and regulation, having managed Consumers Energy's rates group for a number of years. In that function his responsibilities included load and revenue forecasting, overseeing the design of gas and electric rates and testifying in regulatory proceedings. Mr. Polich has testified in over thirty regulatory and legislative proceedings.

Mr. Polich has been involved in the nuclear industry since 1978. While at GDS, Mr. Polich has provided Utah Associated Municipal Power System project cost analysis for a small modular nuclear power project. Last year, he provided advisory services to the Vermont Public Utility Commission on the ownership transfer, nuclear decommissioning trust fund adequacy and decommissioning methodology of Vermont Yankee. Mr. Polich has supported GDS oversight efforts of the construction of the Vogel Nuclear Plant units 2&3 for the Georgia Public Service Commission. He has also provided decommissioning assessment analysis on St. Lucie Nuclear, and Grand Gulf Nuclear projects. Mr. Polich was part of the design engineering team for the Erie Nuclear Plant by the design engineering firm, Gilbert Commonwealth. Key responsibilities were the design of systems and component specifications associated with the nuclear steam supply systems (NSSS) and steam turbine thermal cycle. Worked directly with Babcock and Wilcox on NSSS design and ancillary system specifications. Mr. Polich was also senior engineer on the Midland Nuclear project, responsible for oversight of Bechtel design engineering and interfacing with NSSS vendor Babcock & Wilcox on ancillary systems. His responsibilities also included negotiation with the Nuclear Regulatory Commission on new regulation requirements. Mr. Polich's role evolved into onsite engineering during construction of the Midland Nuclear Plant and as a project trouble shooter at the Palisades Nuclear Plant.

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DESCRIPTION: Richard A. Polich RAP-1

SPECIFIC PROJECT EXPERIENCE

NUCLEAR PROJECT EXPERIENCE

Vermont Yankee – Provided the Vermont Public Utility Commission advisory services on the asset transfer of Vermont Yankee from Entergy Nuclear Operations, Inc. to NorthStar Group Holdings, LLC. This effort has included assessment of financial strength of new company, adequacy of Nuclear Decommissioning Trust Fund to fund decommissioning efforts, evaluation of decommissioning methodology and State of Vermont Risk.

Vogel Nuclear Plant Units 3 & 4 – Mr. Polich has provided advisory services to the team performing the oversight of the construction of the Vogel Plant Units 3 & 4 as part of GDS project oversight responsibilities for the Georgia Public Service Commission.

St. Lucie Nuclear Plant – Provided a risk assessment, decommissioning funding study and ownership evaluation for City of Vero Beach. This included review of project maintenance history, steam generator replacement project, analysis of decommissioning needs and funding and assessing current value of Vero Beach's ownership share.

Grand Gulf Nuclear Project – Assessed the adequacy of decommissioning funding and funding level for the grand Gulf Nuclear plant for Cooperative Energy. Project purpose was to assess changes in decommissioning funding rates and to determine if sufficient funds would be available for plant decommissioning.

Consumers Energy Midland Nuclear Plant – Responsible for overseeing EPC contractor design and construction of primary and secondary nuclear systems. Included review of systems for compliance with Nuclear Regulatory Commission regulations. Key projects included:

- Leading team to analyze plant and determine best methods for compliance with new CFR Appendix R Fire Protection rules
- Design of primary cooling system pump oil collection and disposal systems.
- Oversight of redesign of component cooling water systems.
- Analysis of diesel generator capability to meet emergency shutdown power requirements.
- Primary interface with Dow Chemical for steam supply contract.

Ohio Edison Company Erie Nuclear Project – Design engineer responsible for the design, equipment specifications, bid evaluations and regulatory licensing for nuclear steam supply system and ancillary systems. Key projects included:

- Project Thermal Analysis
- Development of NSS valve specifications
- Major equipment bid Proposal Evaluation and recommendations

Interface with Babcock & Wilcox on NSSS Design

RATES & REGULATORY

GDS associates, Inc. – Managing Director

North Dakota Public Service Commission Staff – Case No. PU-16-666 MDU Generatl Rate Case

Provided testimony on behalf of the North Dakota Public Service Commission Staff regarding return on equity, cost of capital, revenue requirement, and generation resource costs.

North Dakota Public Service Commission Staff – Case No. PU-15-96 NSP Determination of Prudence

Provided testimony on behalf of the North Dakota Public Service Commission Staff regarding analysis and recommendation concerning Northern States Power's ("NSP") need for additional generation resources.

Consumers Energy - Supervisor of Pricing and Forecasting

Managed the group responsible for setting and obtaining regulatory approval for the company's electric and gas rates. Developed new approaches to electric and natural gas competitive pricing, redesigned electric rates to simplify rates and eliminate losses and defined new strategies for customer energy pricing. Negotiated new electric supply contracts with key industrial electric customers resulting in over $800M in annual revenue. Testified in multiple regulatory proceedings.

EOS Energy Options & Solutions – Consulting Company

Provided testimony for multiple clients in both Detroit Edison and Consumers Energy in over 30 regulatory proceedings. Testimony topics included rates, public policy and deregulation. Also testified in several legislative proceedings in both Michigan and Ohio, addressing energy policy. Provided expert witness testimony in Massachusetts regarding wind energy projects.

NATURAL GAS COMBINED CYCLE EXPERIENCE

Consumers Energy – 1,560 MW Midland Cogeneration Venture
Member of a small team selected to investigate the feasibility of converting the mothballed Midland Nuclear Plant into a fossil fueled power plant. Established new plant configuration that repowered the existing nuclear steam turbine with natural gas fired combustion turbines and heat recovery steam generators. Developed the new thermal cycle and heat rate, determined how to supply steam to Dow chemical for cogeneration, developed models for projecting plant performance, defined which portions of the nuclear plant were useful in the new combined cycle plant and forecasted project economics.

Nordic Energy – Vice President

Project Manager for the development of two 1,150 MW IGCC projects proposed to Georgia Power and Xcel Energy in response to RFPs. Responsibilities included establishing thermal cycles, equipment selection, site selection, supervising engineering, developing project proforma and proposals.

Project Manager for 230 MW power barge to be located on the Columbia River near Portland Oregon. Lead the project development team responsible for securing equipment, designing the power plant, design of barges, assessing site feasibility, developing project economics and interconnection applications.

RENEWABLE ENERGY EXPERIENCE

Matinee Energy – Utility Scale Solar Developer

Engineering design and project development consultant for utility scale solar photovoltaic projects. Development activities include site selection, equipment specifications, financial analysis and preparation of proposals. Also responsible for engineering and securing electrical interconnection.

Windlab Developments USA – Wind Power Developer

Responsible for greenfield development of the US platform for wind energy projects east of the Mississippi. Developed the company's engineering protocol for wind project design and construction, responsible for managing engineering design and construction of projects, and established six wind power projects (750 MW). Responsible for negation of Power Purchase Agreements, electrical interconnection studies, interface with Midwest ISO and submitting Generation Interconnection Application.

TradeWind Energy - Wind Power Project Developer

Project developer for 800 MW of wind power projects in Michigan and Indiana. Introduced new project management methods to the development process which resulted in savings of over $200,000 annually on each project.

Third Planet Windpower – Wind Power Project Developer

Engineering and project management consultant to support the startup of new wind power company. Established engineering standards used for selection of wind project equipment and project construction, analysis tools for evaluating projecting wind project power production, and performed project economic modeling.

Noble Environmental Power – Wind Power Project Developer

Electric transmission system consultant on the development of several wind power projects. Supported Noble's decisions on transmission gird interconnect and negotiate interconnection agreements.

ENERGY EFFICIENCY EXPERIENCE

Arkansas Energy Office – Weatherization Assistance Program Evaluation

Evaluated the performance and operations of Arkansas's Weatherization Assistance Program. This included review of program effectiveness, program operations, energy efficiencies attained, adequacy of energy efficiency measures and subcontractor performance.

CLEAResult – Arkansas Energy Efficiency Programs

Energy efficiency operations and program support for 400% increase in Arkansas energy efficiency programs. Developed processes for data collection, field staff deployment and job assignments.

ECONOMIC IMPACT ASSESSMENT

Michigan Department of Environmental Quality - Economic Impacts of a Renewable Portfolio Standard and Energy Efficiency Program for Michigan

Project Manager for this report which focused on the economic impact of renewable portfolio standard and energy efficiency programs on the State of Michigan. The evaluation sued in this report encompassed using integrated resource planning models, econometric modeling and electric pricing models for the entire State of Michigan.

West Michigan Business Alliance - Alternative and Renewable Energy Cluster Analysis

Prepared the report provided a road map for Western Michigan businesses to establish new business in the renewable energy industry.

POWER PROJECT EXPERIENCE:

Detroit Edison St Clair Power Station – Performed coal combustion analysis associated with conversion Powder River Basin coal. Work included pulverizer mill performance testing, boiler combustion analysis on new coal, and unit performance analysis.

Consumers Energy Campbell 3 - Supported start-up efforts of this 800 MW pulverized coal power plant. Part of team that performed analysis of boiler data and determined the cause of superheater failure. Also part of team to analyze performance test data for warranty evaluation.

Consumers Energy Weadock Plant – Design oversight and specified various plant upgrades during major maintenance outage. Included replacement of high-pressure superheater, design of new steam supply pipes, valve specifications and supported plant restart.

PAPERS & PUBLICATIONS

Engineering and Economic Evaluation of Offshore Wind Plant Performance and Cost Data, 2011, Produced for the Electric Power Research Institute, KEMA, Inc.

FERC's 15% Fast Track Screening Criterion, 2012, Paper reviewing the FERC 15% screening criteria for electrical interconnection, KEMA, Inc.

Island of Saint Maarten Sustainable Energy Study, 2012, Produced for the Cabinet of Ministry VROMI, KEMA Inc.

A Study of Economic Impacts from the Implementation of a Renewable Portfolio Standard and an Energy Efficiency Program in Michigan, 2007, Produced for the Michigan Department of Environmental Quality

Alternative and Renewable Energy Cluster Analysis, 2007, Produced for the West Michigan Strategic Alliance and The Right Place

COURSES & SEMINARS

Association of Energy Engineers – Certified Energy Manager
Green Building Council – Associated LEED Certification Training
CLEAResult Leadership Academy

COMMUNITY SERVICE AND ACTIVITIES

Bicycling, hiking and cross-country skiing
Instrument-Rated Private Pilot
Habitat for Humanity
Scoutmaster
Soccer coach and referee
Volunteer work for disaster relief and building homes in Mexico

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DESCRIPTION: Richard A. Polich RAP-2

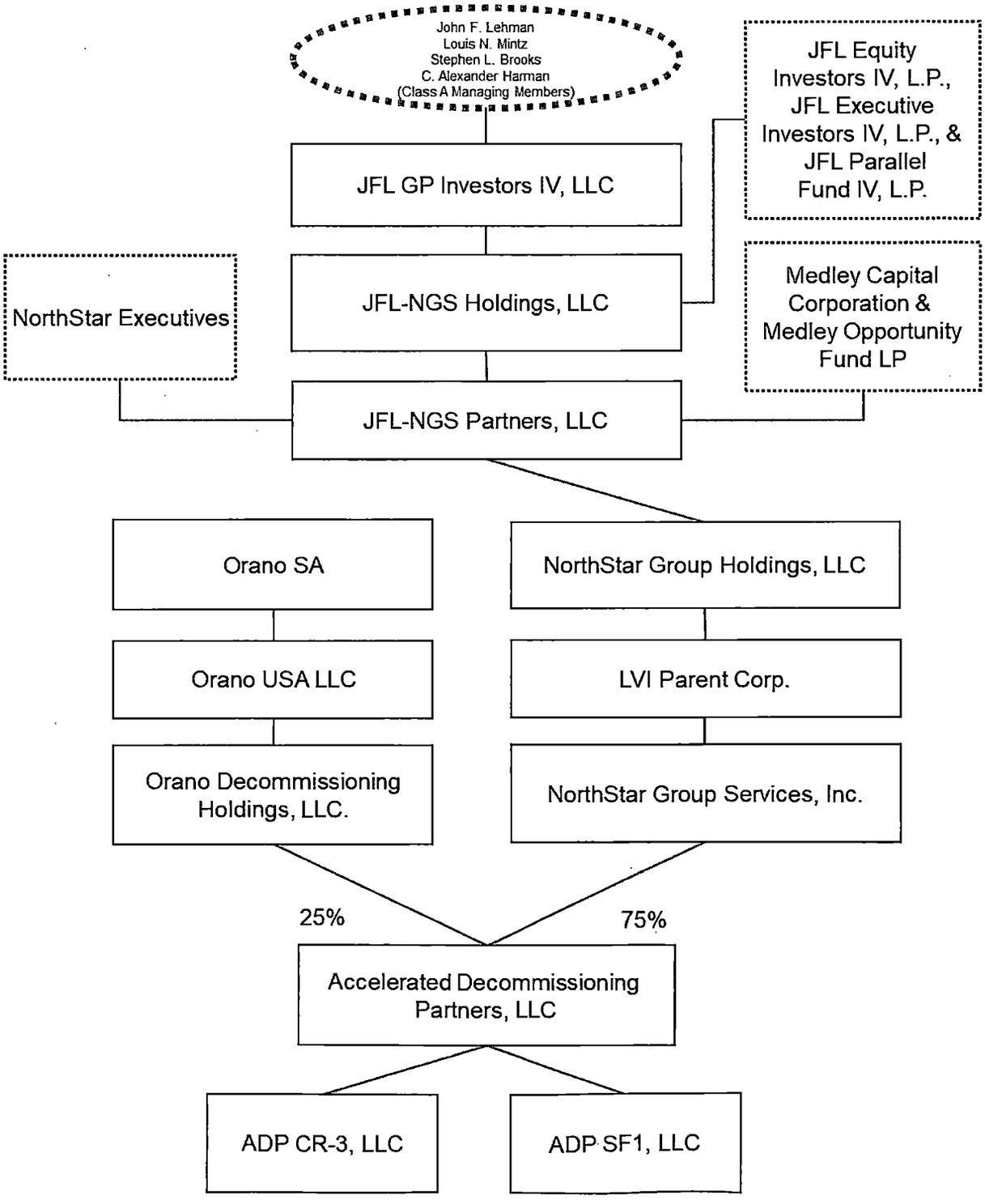
PREVIOUS TESTIMONY OF RICHARD A. POLICH

COMMISSION	CASE	ON BEHALF	TITLE
Florida	20190001-E1	Florida OPC	Fuel and Purchase Power Cost Recovery Clause
FERC	ER17-1821-002	Joint Customers	Revenue Requirement for Reactive Power Production Capability of the Panda Stonewall Generating Facility
North Carolina	E-2 Sub1142	North Carolina AG	Duke Energy Progress General Rate Case
Indiana	38707 FAC111-S1	Nucor Steel	Duke Energy Indiana, LLC for Fuel Cost Adjustment Clause
North Dakota	PU-16-166	ND PSC Staff	Montana-Dakota Utilities 2016 Electric Rate Increase Application
Hawaii	2015-0022	Sun Edison	Regarding the Hawaiian Electric Company, Inc. and NextEra Merger
North Dakota	PU-15-96	ND PSC Staff	Northern States Power Determination of Prudence
Michigan	U-10143	Consumers Energy	Consumers Energy Approval of an Experimental Retail Wheeling Case
Michigan	U-10335	Consumers Energy	General Rate Case
Michigan	U-10625	Consumers Energy	Proposal for Market-Based Rates Under Rate-K
Michigan	U-10685	Consumers Energy	1996 General Rate Case
Michigan	U-11915	Energy Michigan	Supplier Licensing
Michigan	U-11955	Energy Michigan	Consumers Energy Stranded & Implementation Cost Recovery
Michigan	U-11956	Energy Michigan	Detroit Edison Stranded & Implementation Cost Recovery
Michigan	U-12478	Energy Michigan	Detroit Edison Asset Securitization Case
Michigan	U-12488	Energy Michigan	Consumers Energy Retail Open Access Tariff
Michigan	U-12489	Energy Michigan	Detroit Edison Retail Open Access Tariffs
Michigan	U-12505	Energy Michigan	Consumers Energy Asset Securitization Cases
Michigan	U-12639	Energy Michigan	Stranded Cost Methodology Case
Michigan	U-13380	Energy Michigan	Consumers Energy 2000, 2001 & 2002 Stranded Cost Case
Michigan	U-13350	Energy Michigan	Detroit Edison 2000 & 2001 Stranded Cost Case
Michigan	U-13715	Energy Michigan	Consumers Energy Securitization of Qualified Costs
Michigan	U-13720	Energy Michigan	Consumers Energy 2002 Stranded Costs
Michigan	U-13808	Energy Michigan	Detroit Edison General Rate Case
Michigan	U-13808-R	Energy Michigan	Detroit Edison 2004 Stranded Cost &
Michigan	U-14474	Energy Michigan	Detroit Edison 2004 PSCR Reconciliation Case

PREVIOUS TESTIMONY OF RICHARD A. POLICH

COMMISSION	CASE	ON BEHALF	TITLE
Michigan	U-13933	Energy Michigan	Detroit Edison Low-Income Energy Assistance Credit for Residential Electric Customers
Michigan	U-13917-R	Energy Michigan	Consumers Energy 2004 PSCR Reconciliation Case
Michigan	U-13989	Energy Michigan	Consumers Energy Request for Special Contract Approval
Michigan	U-14098	Energy Michigan	Consumers Energy 2003 Stranded Costs
Michigan	U-14148	Energy Michigan	Consumers Energy MCL 460.10d(4) Case
Michigan	U-14347	Energy Michigan	Consumers Energy General Rate Case
Michigan	U-14274-R	Energy Michigan	Consumers Energy 2005 PSCR Reconciliation Case
Michigan	U-14275-R	Energy Michigan	Detroit Edison Company 2005 PSCR Reconciliation Case
Michigan	U-14399	Energy Michigan	Detroit Edison Company Application for Unbundling of Rate
Michigan	U-14992	Energy Michigan	Power Purchase Agreement and for Other Relief in Connection with the sale of the Palisades Nuclear Power Plant and Other Assets

Figure 2: SIMPLIFIED ORGANIZATION CHART



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DESCRIPTION: Richard A. Polich RAP-3

CONFIDENTIAL

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DOCKET: 20190140-EI EXHIBIT: 12
PARTY: OFFICE OF PUBLIC COUNSEL – DIRECT
DESCRIPTION: Richard A. Polich RAP-4

CONFIDENTIAL

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PARTY: OFFICE OF PUBLIC COUNSEL – DIRECT
DESCRIPTION: Richard A. Polich RAP-5

CONFIDENTIAL

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 14
PARTY: OFFICE OF PUBLIC COUNSEL – DIRECT
DESCRIPTION: Richard A. Polich RAP-6

CONFIDENTIAL

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 15
PARTY: OFFICE OF PUBLIC COUNSEL – DIRECT
DESCRIPTION: Richard A. Polich RAP-7

CONFIDENTIAL

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 16
PARTY: OFFICE OF PUBLIC COUNSEL – DIRECT
DESCRIPTION: Richard A. Polich RAP-8

EXHIBIT NOT ENTERED

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 17
PARTY: OFFICE OF PUBLIC COUNSEL – DIRECT
DESCRIPTION: Richard A. Polich RAP-9

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 18
PARTY: DUKE ENERGY FLORIDA – REBUTTAL
DESCRIPTION: Jeff Adix JA-1

Jeffrey P. Adix

Professional Experience

Waste Control Specialists LLC – Dallas, Texas (December 2018 – Present)
Vice President and Chief Financial Officer

- Waste Control Specialists (WCS) is a treatment, storage, and disposal company dealing in radioactive, hazardous, and mixed wastes. WCS is the only privately owned and operated facility in the United States that has been licensed to treat, store and dispose of Class A, B and C low-level radioactive waste.

NorthStar Group Services, Inc. – New York, New York (January 2016 – Present)
Vice President, Chief Financial Officer, and Treasurer

- NorthStar is the largest demolition, decommissioning, and environmental remediation company in the United States, with more than $600 million of annual revenue generated across a national platform.

Fiserv, Inc. – Brookfield, Wisconsin (November 2013 – October 2015)
Senior Vice President Finance – Depository Institution Services Group (03/14 – 10/15)
Senior Vice President Finance – Financial Institutions Group (11/13 – 02/14)

- Group Chief Financial Officer for multiple $1-2 billion operating groups within Fiserv. Fiserv (NASDAQ: FISV), is a leading global payments and financial technology provider, with annual revenue of more than $10 billion.

Veolia Environmental Services North America Corp. – Chicago, Illinois (December 2012 – August 2013)
President and Chief Executive Officer

- Full P&L responsibility for the $800M North American Environmental Services business of Veolia Environnement (NYSE: VE and Paris Euronext: VIE), a global company with 2012 revenues of over $38B.

ManpowerGroup Inc. – Milwaukee, Wisconsin (March 2009 – November 2012)
Vice President – Audit Advisory Services (04/11 – 11/12)

- Chief Audit Executive for this $20 billion publicly-traded staffing and workforce solutions company (NYSE: MAN – fka Manpower Inc.), with operations spanning more than 80 countries.

Executive Vice President and Chief Financial Officer (CFO) – Right Management Inc. (03/09 – 03/11)

- Leadership Team member for global professional services business owned by ManpowerGroup, with operations generating peak revenue of more than $500M across approximately 30 countries.

Veolia Environmental Services North America Corp. – Chicago, Illinois (November 2000 – February 2009)
Senior Vice President of Support Services (01/07 – 02/09) (Promoted from VP to Sr. VP in 01/08)

- Executive committee member for the $2.2 billion North American Environmental Services business of Veolia Environnement (VE), reporting to the CEO.

Vice President of Finance & Chief Financial Officer (11/00 – 02/09) (CFO title added in October 2005)

- Top financial executive of the $850M Solid Waste business unit of Veolia North America.

S.C. Johnson and Son, Inc. - Racine, Wisconsin (January 1997 – November 2000)
Area Controller -- Americas Region (10/98 – 11/00)
Financial Support Manager -- International Finance (1/97 - 10/98)

Arthur Andersen LLP - Milwaukee, Wisconsin (July 1989 - December 1996)
Experienced Manager & Consulting Segment Leader for Shareholder Value and Cost Management Services (Final Position)

Education and Certification

- Master of Business Administration (MBA) - University of Wisconsin – Milwaukee, 2004.
- Bachelor of Science in Business Administration - Drake University, Des Moines, Iowa, 1989. Summa cum laude – Degrees in Accounting, Corporate Finance and Computer Information Systems.
- Certified Public Accountant

Other Community and Professional Activities

- Wisconsin Independent Learning College – Board Treasurer (July 2014 – July 2016)
- Best Buddies Wisconsin – Advisory Board (June 2011 – December 2013)
- Solid Waste Association of North America – International Board (June 2003 – September 2006)

CONFIDENTIAL

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 19
PARTY: DUKE ENERGY FLORIDA – REBUTTAL
DESCRIPTION: Jeff Adix JA-2

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DEF's Reponses to Staff's Second Set of Interrogatories Nos. 8-16.

Additional files contained on Staff Hearing Exhibits CD for Nos. 6-16

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 20
PARTY: STAFF HEARING EXHIBITS
DESCRIPTION: Terry Hobbs

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Duke Energy Florida, LLC to Approve Transaction with Accelerated Decommissioning Partners, LLC for Accelerated Decommissioning Services at the CR3 Facility, Transfer of Title to Spent Fuel, and Assumption of Operations of the CR3 Facility Pursuant to the NRC License, and Request for Waiver From Future Application of Rule 25-6.04365, F.A.C. for Nuclear Decommissioning Study	DOCKET NO.: 20190140-EI Dated: October 16, 2019

DUKE ENERGY FLORIDA, LLC'S RESPONSE TO
STAFF'S SECOND SET OF INTERROGATORIES (NOS. 8-16)

Duke Energy Florida, LLC, ("DEF"), by and through undersigned counsel, hereby responds to *Staff's Second Set of Interrogatories to Duke Energy Florida, LLC (Nos. 8-16)* served on September 16, 2019, by the Staff of the Florida Public Service Commission ("FPSC"), as follows:

INTERROGATORIES

8. Provide a current recap and description of the CR3 Decommissioning project work accomplished and planned for the period 2017 through 2020.

RESPONSE:

For purposes of this response, "CR3 Decommissioning project work," is considered to be those activities directly related to the subject of the petition filed with the FPSC, which is limited to that associated with the Decommissioning Services Agreement between DEF and Accelerated Decommissioning Partners, LLC ("ADP").

Major CR3 Decommissioning project work accomplished and planned for period 2017 through 2020 are as follows:

- November 2017: Request for Information (RFI) directed to 14 vendors

- December 2017: Responses received from 8 vendors
- 1st quarter 2018: DEF meet with the 8 vendors
- May 2018: Request for Proposals (RFP) directed to 6 vendors
- July 2018: Four vendor teams submitted proposals
- September 2018: DEF short listed to two bidders
- October 2018: Two vendor teams performed on-site due diligence process
- November 2018: Duke Energy Senior Management Committee review
- December 2018: Duke Energy BOD Nuclear Oversight Committee review
- December 2018 DEF received refreshed bids from the two selected vendors
- January 2019: Duke Energy selects one vendor to enter into contract negotiations
- May 2019: Decommissioning Services Agreement signed with ADP
- June 2019: License transfer application submitted to Nuclear Regulatory Commission
- July 2019: Petition and testimony submitted to Florida Public Service Commission
- July 2019: Private letter ruling request submitted to Internal Revenue Service
- January 2020: License transfer application approved by the Nuclear Regulatory Commission
- May 2020: Close deal with ADP

9. For purposes of this request, please refer to page 5, lines 19 through 23 of Witness Hobbs' prefiled direct testimony which states, "DEF…decided to determine the feasibility, customer benefit, and market interest in changing the CR3 Facility decommissioning strategy…." Please describe in detail the steps and processes employed in making the determinations listed. Please identify the key DEF staff members and external contributors making these determinations, and explain the role played by each.

RESPONSE:

Please refer to Witness Hobbs' testimony, page 6, lines 2 through 22, and page 7, lines 1 and 2; along with Witness Palasek's testimony, page 3, line 16 through page 6, line 22 for the processes and steps used to determine market interest in changing the CR3 Facility decommissioning strategy.

Please refer to Witness Palasek's testimony, page 7, lines 9 through 19, and page 8, lines 1 through 7 for the processes and steps used to determine the feasibility and customer benefit in changing the CR3 Facility decommissioning strategy.

The following key DEF staff members and external contributors supported making these determinations:

Evaluation Team Member	Role
External Contributors	Provided guidance on process and input regarding RFI and RFP, knowledge was gained through such external contributor's previous decommissioning experience. Independently assessed DEF vendor and model shortlist, as well as final vendor recommendation.
Supply Chain	Supported development of RFI and RFP. Provided governance and oversight of evaluation process.
Technical Team: • D&D Project Manager • Radiation Protection/Waste Handling • Operations • Engineering • Chemistry • Licensing • Nuclear Security • Maintenance	Provided technical input to RFI and RFP. Provided technical review of proposals.
Commercial/Financial Team: • D&D Project Director • Manager, Finance • Project Controls Specialist	Provided commercial/financial review of proposals.
DEF Legal Council	Provided legal input to RFP. Provided legal review of proposals.

10. Provide a listing and brief scope description of all internal and external audits or studies completed or planned to date that are related to changing from the CR3 decommissioning STAFSTOR strategy to an alternative approach. Please indicate whether recommended actions were included as a deliverable.

RESPONSE:

Please refer to Witness Hobbs' testimony, page 6, lines 2 through 22, and page 7, lines 1 and 2; along with Witness Palasek's testimony, page 3, lines 16 through page 6, line 22 for the processes and steps used to determine market interest in changing the CR3 Facility decommissioning strategy.

Please refer to Witness Palasek's testimony, page 7, lines 9 through 19; and page 8, lines 1 through 7; for the processes and steps used to determine the feasibility and customer benefit in changing the CR3 Facility decommissioning strategy.

DEF also performed benchmarking of the San Onofre Nuclear Generating Station (SONGS) and the Zion nuclear units, all currently in the DECON decommissioning strategy.

The applicable results of the above studies were incorporated into the DEF RFI and RFP development, and RFP evaluations.

11. Provide a description of pending NRC and other regulatory applications, approvals and certifications required for the CR3 Decommissioning project and provide a timeline for completing each.

RESPONSE:

For purposes of this response, "CR3 Decommissioning project," is considered to be those activities directly related to the subject of the petition filed with the FPSC, which is limited to that associated with the Decommissioning Services Agreement between DEF and ADP.

There are pending regulatory applications and approvals that are required for the CR3 Decommissioning project with the NRC at the federal level and with the Florida Department of Environmental Protection (FDEP) at the state level. Additional information is provided below.

NRC pending applications and approvals

Application Title	Date Submitted	Date Approval Requested by DEF
Duke Energy Florida, LLC (DEF) to U.S. Nuclear	June 17, 2019	December 31, 2019*

Regulatory Commission, "Application for Order Consenting to Direct Transfer of Control of Licenses and Approving Conforming License Amendment," dated June 14, 2019.		*Per NRC email to DEF, approval expected in January 2020.

FDEP pending applications and approvals

Permit(s)	Action Requested	Date Submitted	Date Approval Requested by DEF
Conditions of Certification (COC) DEF Crystal River Energy Complex (CREC) Sections PA 77-09S • CR3 South Laydown Area-Storm Water System Permits 09-0270612-005 and 017 • CR3 Spent Fuel Storage Area Storm Water System Permit PA77-090	DEF requested that FDEP modify the COC to relinquish the CR3 certification and relocate CR3 specific conditions to a standalone Order or Permit that can be transferred to ADP upon contract close.	June 21, 2019	N/A
NPDES Wastewater Discharge Permit FL0000159	DEF requested a CR3 specific NPDES permit be issued that is transferrable to ADP upon contract close.	October 8, 2018** June 6, 2019*** **Permit Renewal ***Modified Renewal request to include CR3 specific permit	N/A

12. Please indicate whether the NRC issues Request for Additional Information (RAI) as part of its decommissioning oversight activities and, if so, describe the process of receiving and responding to RAIs related to CR3 decommissioning.

RESPONSE:

The NRC Request for Additional Information (RAI) process is only used during NRC review and approval of licensee submitted applications and is not used as part of its decommissioning oversight activities. The NRC uses an inspection process and procedures during decommissioning to verify licensee compliance with regulatory requirements established to

ensure adequate protection of public health and safety, protection of the environment, and safeguarding of nuclear materials and nuclear power plants in the interest of national security.

Prior to performing an inspection, the NRC provides the licensee with a list of documents and activities they plan to inspect. During the inspection, the NRC performs onsite inspection activities such as document reviews, observation of plant work activities, interviews with plant personnel, and inspection of plant equipment, components, and material conditions. If an inspection shows that a licensee is not safely conducting a regulatory required activity or safely operating a facility, they inform the licensee of any problems identified and ensure they are addressed. Inspection reports are provided to the licensee and are publicly available after completion of the inspection in the NRC document management system (ADAMS).

The inspection process and procedures used during decommissioning are primarily described in NRC Inspection Manual Chapter 2561, "Decommissioning Power Reactor Inspection Program." The core inspection procedures required during decommissioning and the discretionary inspection procedures that are also considered for use during decommissioning inspections are listed below. Inspection procedures are publicly available in the NRC document management system (ADAMS).

Core Inspection Procedures for Decommissioning Power Reactors

IP 36801	Organization, Management and Cost Controls at Permanently Shutdown Reactors (PSRs)
IP 37801	Safety Reviews, Design Changes, and Modifications at PSRs
IP 40801	Self-Assessment, Auditing, and Corrective Action at PSRs
IP 60801	Spent Fuel Pool Safety at PSRs
IP 62801	Maintenance and Surveillance at PSRs
IP 71801	Decommissioning Performance and Status Reviews at PSRs
IP 83750	Occupational Radiation Exposure
IP 83801	Inspection of Remedial and Final Surveys at PSRs
IP 84750	Radioactive Waste Treatment, and Effluent and Environmental Monitoring
IP 86750	Solid Radioactive Waste Management and Transportation of Radioactive Materials
IP 71111.01	Adverse Weather Preparations

Discretionary Inspection Documents for Decommissioning Power Reactors

The inspection guidance documents listed below are applicable to programs outside the reactor decommissioning inspection process. However, the information they contain is used where it is applicable to supplement or enhance inspection activities undertaken in accordance with the core decommissioning inspection procedures listed above.

Plant Operations and Oversight

IP 42700	Plant Procedures
IP 60705	Preparation for Refueling
IP 60710	Refueling Activities

IMC 0350 Oversight of Reactor Facilities in a Shutdown Condition Due to Significant Performance and/or Operational Concerns
IMC 0375 Implementation of the Reactor Oversight Process at Reactor Facilities in an Extended Shutdown Condition for Reasons Not Related to Performance

Radiological Controls

IP 69004 Non-Power Reactor Effluent and Environmental Monitoring
IP 71124 Radiation Safety—Public and Occupational
IP 83100 Occupational Exposure During SAFSTOR and DECON
IP 83723 Training and Qualifications: General Employee Training, Radiation Safety, Plant Chemistry, Radwaste, and Transportation Training
IP 83724 External Occupational Exposure Control and Personal Dosimetry
IP 83725 Internal Exposure Control and Assessment
IP 83726 Control of Radioactive Materials and Contamination, Surveys and Monitoring
IP 83728 Maintaining Occupational Exposures As Low As Reasonably Achievable
IP 83729 Occupational Radiation Exposure During Extended Outages
IP 83890 Closeout Inspection and Survey
IP 84101 Radioactive Waste Management
IP 84850 Radioactive Waste Management-Inspection of Waste Generator Requirements of 10 CFR Part 20, "Standards for Protection Against Radiation," and 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste"
IP 86740 Inspection of Transportation Activities
IP 88035 Radioactive Waste Processing, Handling, Storage, and Transportation
IP 88045 Effluent Control and Environmental Protection

MAINTENANCE, SURVEILLANCE, AND FIRE PROTECTION

IP 42051 Fire Prevention and Protection
IP 61726 Surveillance Observation
IP 62700 Maintenance Program Implementation
IP 62706 Maintenance Rule
IP 64704 Fire Protection Program
IP 69010 Research and Test Reactor Surveillance
IP 88025 Maintenance and Surveillance of Safety Controls

EMERGENCY PREPAREDNESS AND PHYSICAL SECURITY

IP 81311 Physical Security Requirements for Independent Spent Fuel Storage Installations
IP 81502 Fitness For Duty
IP 82401 Decommissioning Emergency Preparedness Scenario Review and Exercise Evaluation
IP 82501 Decommissioning Emergency Preparedness Program Evaluation
IP 85103 Material Control and Accounting at Decommissioning Nuclear Power Reactors
IP 87137 10 CFR Part 37 Materials Security Programs
IMC 2202 Security Inspection Program for Decommissioning Reactors

ENGINEERING AND TECHNICAL SUPPORT

IP 37700	Design Changes and Modifications
IP 41500	Training and Qualification Effectiveness
IP 69007	Research and Test Reactor Review and Audit and Design Change Functions
IMC 2690	Inspection Program for Dry Storage of Spent Reactor Fuel at Independent Spent Fuel Storage Installations and for 10 CFR Part 71 Transportation Packagings

SAFETY ASSESSMENT AND QUALITY ASSURANCE

IP 71152	Problem Identification and Resolution
IP 88110	Quality Assurance: Problem Identification, Resolution and Corrective Action
IP 90712	In-office Review of Written Reports of Non-Routine Events At Power Reactor Facilities
IP 92700	Onsite Follow-up of Written Reports of Non-Routine Events At Power Reactor Facilities
IP 92701	Follow-up
IP 92702	Follow-up on Traditional Enforcement Actions Including Violations, Deviations, Confirmatory Action Letters, Confirmatory Orders, And Alternative Dispute Resolution Confirmatory Orders
IP 92720	Corrective Action
IMC 1230	Quality Assurance Program for Radiological Confirmatory Measurements
IMC 1232	Collection, Preparation, and Shipment of Independent Measurement Samples

ORGANIZATION, MEETINGS, AND DOCUMENTATION

IP 69006	Research and Test Reactors Organization and Operations and Maintenance Activities
IMC 0620	Inspection Documents and Records
IMC 1007	Interfacing Activities Between Regional Offices of NRC and OSHA

13. Please describe in detail the processes under the proposed DECON approach by which DEF plans to identify, analyze, and track project risks and how it develops risk mitigation plans for each identified risk.

RESPONSE:

DEF will not manage decommissioning execution risk. This risk is transferred to ADP CR3, LLC ("ADPCR3"). Please refer to Witness Hobbs' testimony, page 10, lines 14 through 24, and page 11, lines 1 through 10 for the description of the risks that will remain with DEF during the decommissioning and related risk mitigation processes.

14. Please identify any overall project planning documents (such as a project charter or integrated project plan) to be used under the DECON approach to govern execution of the CR3 decommission project.

RESPONSE:

ADCR3 has provided its planned approach to decommissioning CR3 as part of its proposal (ADP Proposal for Accelerated Nuclear Decommissioning Project, Crystal River 3). Detailed planning will begin at closure.

15. Please describe DEF's current or planned use of CR3 decommissioning progress reporting tools such as periodic update presentations, status reports, Key Performance Indicator tracking, and project dashboards.

RESPONSE:

For purposes of this response, "CR3 decommissioning," is considered to be those activities directly related to the subject of the petition filed with the FPSC, which is limited to that associated with the Decommissioning Services Agreement between DEF and ADP.

DEF has made presentations regarding the CR3 decommissioning project to multiple executive groups including:

- Senior Management Committee,
- Nuclear Oversight Committee,
- Transaction Review Committee, and
- Finance and Risk Management Committee of the Board of Directors.

These presentations described the feasibility, costs, processes, risks and advantages of the CR3 decommissioning project.

There is no current or planned use of CR3 decommissioning progress reporting tools; however, DEF expects to create progress reporting tools for future use in connection with CR3 decommissioning.

16. Please describe in detail the extent to which DEF intends to maintain an oversight role over ADP during its work on the CR3 decommissioning project. Please include plans for audits and QA reviews, periodic reporting requirements, executive and senior management-level briefings, etc.

RESPONSE:

For purposes of this response, "CR3 Decommissioning project," is considered to be those activities directly related to the subject of the petition filed with the FPSC, which is limited to that associated with the Decommissioning Services Agreement between DEF and ADP.

Please refer to Witness Hobbs' testimony, page 13, lines 20 through 23, and page 14, lines 1 through 9 for a description of DEF's ongoing activities during the CR3 Decommissioning project.

DEF plans also to contract with an independent consulting firm to independently assess ADP's project performance and invoicing process on a periodic basis.

Details of ADP's reporting requirements to DEF are included in Attachment 9 to the Decommissioning Services Agreement, which is attached as Exhibit No. __ (TH-1) to Witness Hobbs' testimony.

AFFIDAVIT

STATE OF FLORIDA)

COUNTY OF Citrus)

I hereby certify that on this 8th day of October, 2019, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared Terry Hobbs, who is personally known to me, and he/she acknowledged before me that he/she provided the answers to interrogatory number(s) 8-16 from STAFF'S SECOND SET OF INTERROGATORIES TO DUKE ENERGY FLORIDA, LLC. (NOS. 8-16) in Docket No(s) 20190140-EI, and that the responses are true and correct based on his/her personal knowledge.

In Witness Whereof, I have hereunto set my hand and seal in the State and County aforesaid as of this 8th day of October, 2019.

Carolle Butler

Notary Public
State of Florida, at Large

My Commission Expires:
July 18, 2023

CAROLLE BUTLER
Notary Public-State of Florida
Commission # GG 356655
My Commission Expires
July 18, 2023

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DEF's Responses to Staff's Third Set of Interrogatories Nos. 17-20.

19 & 20 – Confidential DN. 10958-2019

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 21
PARTY: STAFF HEARING EXHIBITS
DESCRIPTION: Terry Hobbs

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Duke Energy Florida, LLC to Approve Transaction with Accelerated Decommissioning Partners, LLC for Accelerated Decommissioning Services at the CR3 Facility, Transfer of Title to Spent Fuel, and Assumption of Operations of the CR3 Facility Pursuant to the NRC License, and Request for Waiver From Future Application of Rule 25-6.04365, F.A.C. for Nuclear Decommissioning Study	DOCKET NO.: 20190140-EI Dated: November 15, 2019

DUKE ENERGY FLORIDA, LLC'S RESPONSE TO STAFF'S THIRD SET OF INTERROGATORIES (NOS. 17-20)

Duke Energy Florida, LLC, ("DEF"), by and through undersigned counsel, hereby responds to *Staff's Third Set of Interrogatories to Duke Energy Florida, LLC (Nos. 17-20)* served on October 18, 2019, by the Staff of the Florida Public Service Commission ("FPSC"), as follows:

INTERROGATORIES

17. Please refer to the direct testimony of witness State, page 3, line 23, and page 4, lines 1-4. Provide a cost estimate for Duke Energy Florida, LLC (DEF) to employ a decommissioning operations contractor for the accelerated decommissioning of Crystal River 3.

RESPONSE:

DEF offered the Decommissioning General (operations) Contractor ("DGC") model as a potential transaction structure in the RFP, but did not receive any proposals for this model. Therefore, DEF does not have a competitively bid cost estimate for the accelerated decommissioning of Crystal River 3 under the DGC model.

For illustrative comparison, DEF's last decommissioning cost study, filed September 10, 2018 (Document No. 05915-2018), was based on the DGC model and it assumed the SAFSTOR

decommissioning method ("SAFSTOR Study"). The cost estimate for the SAFSTOR Study was $895,893 million, which included spent fuel management costs. The cost estimate under the SAFSTOR Study can be used as a reasonable correlation in estimating costs for accelerated decommissioning under the DGC model by subtracting period 2 (dormancy) and spent fuel management costs from the SAFSTOR Study cost estimate, which results in an estimated cost of $797,312 million. In considering estimated costs, it is important to note that under a DGC model, all risk associated with decommissioning execution and spent fuel management would have been retained by DEF.

18. Please refer to the direct testimony of witness Palasek, page 4, lines 18-19. Please explain why DEF did not opt to issue a broad request for information (RFI)

a. Please explain how DEF selected the 14 vendors for the RFI process.

RESPONSE:

DEF wanted to ensure that it only considered bids from companies with proven track records in the decommissioning field, rather than receive bids from inexperienced companies. The vendors DEF selected for the RFI process were representative of the population of vendors who were, and are, active and experienced in the U.S. decommissioning industry.

a. DEF reviewed industry activity, benchmarked plants that are being decommissioned, and received input from external industry subject matter experts to identify and select the fourteen vendors for the RFI process.

19. Please refer to the direct testimony of witness Palasek, page 6, lines 1-2. Please explain why two of the eight vendors that responded to the RFI were excluded from the request for proposals (RFP) process.

RESPONSE:

Certain information in the following response is confidential and is being redacted for confidentiality subject to DEF's Third Request for Confidential Classification submitted in connection with this Response to Staff's Third Set of Interrogatories.

One vendor [redacted] only considered cost plus/target pricing in its RFI response. The other vendor [redacted] only considered cost plus/target pricing as a project management contractor in its RFI response. The cost plus/target pricing model is not a fixed scope/fixed price model. It does not transfer risk to the vendor and provides for a change order process. DEF did not select these two vendors to participate in the RFP process because the pricing models identified in the RFI responses did not provide cost certainty and were not considered cost effective or competitive, specifically with respect to risk transfer and accountability for project execution.

20. Please refer to the direct testimony of witness Palasek, page 7, lines 21-22. Please complete the table below listing the four vendors that responded to DEF's RFP, the total estimated project cost provided by each bidder, and the reason for dismissal, if applicable.

RESPONSE:

Certain information in the following response is confidential and is being redacted for confidentiality subject to DEF's Third Request for Confidential Classification submitted in connection with this Response to Staff's Third Set of Interrogatories.

Vendor	Bid	Reason for Dismissal
ADP	$ 540,000	N/A
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

AFFIDAVIT

STATE OF FLORIDA)

COUNTY OF Citrus)

I hereby certify that on this 13th day of November, 2019, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared Terry Hobbs, who is personally known to me, and he/she acknowledged before me that he/she provided the answers to interrogatory number(s) 17-20 from STAFF'S THIRD SET OF INTERROGATORIES TO DUKE ENERGY FLORIDA, LLC. (NOS. 17-20) in Docket No(s) 20190140-EI, and that the responses are true and correct based on his/her personal knowledge.

In Witness Whereof, I have hereunto set my hand and seal in the State and County aforesaid as of this 13th day of November, 2019.

Carolle Butler

Notary Public
State of Florida, at Large

CAROLLE BUTLER
Notary Public-State of Florida
Commission # GG 356655
My Commission Expires
July 18, 2023

My Commission Expires:
July 18, 2023

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DEF's Responses to Staff's Fourth Set of Interrogatories Nos.21-37, 38A-C, 39, and 40.

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 22
PARTY: STAFF HEARING EXHIBITS
DESCRIPTION: Terry Hobbs (21-30, 33-36, 38A-C) David L. Doss (31, 32, 37, 39, 40)

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Duke Energy Florida, LLC to Approve Transaction with Accelerated Decommissioning Partners, LLC for Accelerated Decommissioning Services at the CR3 Facility, Transfer of Title to Spent Fuel, and Assumption of Operations of the CR3 Facility Pursuant to the NRC License, and Request for Waiver From Future Application of Rule 25-6.04365, F.A.C. for Nuclear Decommissioning Study	DOCKET NO.: 20190140-EI Dated: December 20, 2019

DUKE ENERGY FLORIDA, LLC'S RESPONSE TO STAFF'S FOURTH SET OF INTERROGATORIES (NOS. 21-40)

Duke Energy Florida, LLC, ("DEF"), by and through undersigned counsel, hereby responds to *Staff's Fourth Set of Interrogatories to Duke Energy Florida, LLC (Nos. 21-40)* served on November 22, 2019, by the Staff of the Florida Public Service Commission ("FPSC"), as follows:

INTERROGATORIES

21. Please refer to the "Petition to approve transaction for accelerated decommissioning services at CR3 facility, transfer of title to spent fuel and associated assets, and assumption of operations of CR3 facility pursuant to the NRC license, and request for waiver from future application of Rule 25-6.04365, F.A.C. for nuclear decommissioning study, by Duke Energy Florida, LLC" (Petition), page 10, section 30. Toward the bottom of section 30, the petition reads: "ADPCR3 anticipates shipping such waste to an interim spent fuel storage facility, which may enable spent fuel to be removed from the CR3 Facility sooner than the current [U.S. Department of Energy] estimated removal date of 2037. Please discuss whether the "interim spent fuel storage facility" alluded to has been identified, constructed, and received all necessary permitting and licensing to receive and temporarily store high-level nuclear waste.

RESPONSE:

There are two interim spent fuel storage facilities being pursued in the United States of America. Interim Storage Partners submitted an application for a consolidated interim storage facility to the Nuclear Regulatory Commission ("NRC") in April 2016 (Docket

Number 72-1050). Interim Storage Partners is a joint venture between Oreno USA and Waste Control Specialist ("WCS"). Orano USA LLC's subsidiary, Orano TN (formerly known as TN Americas), holds the license for the dry storage system used at the CR3 Facility. The application is currently under NRC review. The application states that the consolidated interim storage facility will be located in Andrews County, Texas. The licensing activities are in progress and no construction activities are in progress. The current schedule for both licensing and construction supports readiness to receive used nuclear fuel shipments by 2024.

Holtec International submitted an application for a consolidated interim storage facility to the NRC in March 2017 (Docket Number 72-1051). The application is currently under NRC review. The application states that the consolidated interim storage facility will be located in Lea County, New Mexico. The licensing activities are in progress and no construction activities are in progress.

22. Please refer to Duke Energy Florida's 2017 Second Revised and Restated Stipulation and Settlement Agreement (SRRSSA), filed and approved in Docket No. 20170183-EI for the following request. If the Florida Public Service Commission (FPSC) approves Duke Energy Florida's (DEF or Company) request in the instant proceeding, how if at all, does it effect the Company's ability to invoke or avail itself of the provisions contained in Paragraphs 5.a.(1) and 7 of the SRRSSA during the settlement term?

RESPONSE:

DEF's request has no impact on its ability to avail itself of paragraph 5(a)1 or 7. Specifically, paragraph 5(a)1 regards the ISFSI costs, while DEF's request in this docket is with respect to the decommissioning costs. The ISFSI costs will be handled pursuant to the requirements of paragraph 5(a)1, but separately from the decommissioning costs. Regarding paragraph 7, DEF would be able to avail itself of those rights if, during the remaining term of the Settlement Agreement, DEF determines that additional funds are necessary in order to fund the Nuclear Decommissioning Trust in support of decommissioning the CR3 Facility.

23. Please refer to the Direct Testimony of Terry Hobbs, page 9, lines 6-10. Please further discuss using the term "financial risk" to describe a situation where "the returns on the NDT would be higher than the escalation in the cost to decommission the [Crystal River Unit No. 3] Facility."

RESPONSE:

The "financial risk" is a situation where the rate of cost escalation for the decommissioning process is higher than the investment earnings for the NDT. This "financial risk" situation would diminish the ability of the NDT to fund the decommissioning of the CR3 Facility.

24. Please refer to the Direct Testimony of Terry Hobbs, Exhibit (TH-2), page 2 of 12. At the end of the section titled "Introduction," it states that "some specific elements contained in subsections (3) and (4) of Rule 25-6.04365 [Florida Administrative Code] do not apply to this study and as such are not presented."

a. Please specifically identify all portions of subsections (3) and (4) of Rule 25-6.04365, Florida Administrative Code (F.A.C.), that the Company believes do not apply to its filing under Rule 25-6.04365, F.A.C.
b. Please provide a justification statement associated with any specific provision the Company identifies in its response to subpart (a.).

RESPONSE to subpart a.:

The following specific provisions of Subsection (3) of Rule 25-6.04365, F.A.C., Nuclear Decommissioning Study, do not apply to DEF's filing under Rule 25-6.04365, F.A.C.:

(a) Not applicable for a plant in the decommissioning process.

(b) Not applicable since DEF is the sole owner of the CR3 Facility.

(d) Not applicable since the fixed-price contract was used in lieu of a study methodology.

(e) Not applicable – same justification as item (d) directly above.

(k) Not applicable because the CR3 Facility assets were removed from the rate base in 2012.

(l) Not applicable since no accrual is in place.

(m) Not applicable – same justification as item (l) directly above.

The following specific provisions of Subsection (4) of Rule 25-6.04365, F.A.C., Accumulation of Annual Accruals, do not apply to DEF's filing under Rule 25-6.04365, F.A.C.:

(a) Not applicable since no accrual is in place.

(b) Not applicable – same justification as item (a) directly above.

RESPONSE to subpart b.:

The specific provisions identified in response to subpart a. above do not apply to DEF's filing under Rule 25-6.04365, F.A.C. because such specific provisions are not applicable to a nuclear power plant that is in the decommissioning process and which is also not collecting

funds from utility customers for a decommissioning trust fund. Additionally, see justification statements for each specific provision set forth in response to subpart a. to this Interrogatory No. 24.

25. Please refer to the Direct Testimony of Terry Hobbs, Exhibit (TH-2), page 3 of 12, specifically the paragraph beginning with: "DEF post-closing operating costs."

    a. Please further discuss what constitutes "oversight and pay item validation."
    b. Please further discuss and/or define what constitutes "non-labor recurring costs."
    c. Please discuss what "taxes" are being referred to.
    d. Please discuss what "fees" are being referred to.
    e. Please discuss what "insurance costs" are being referred to.

RESPONSE to subpart a.:

"Oversight" relates to DEF's on-going activities during the decommissioning project with ADP. DEF will maintain oversight of the investment of the NDT funds, but it will agree with ADP on the desired investment strategy and designated investment manager for the subaccount holding the funds to pay the fixed price under the DSA. Throughout the project, ADPCR3 will supply DEF with project reports, including reports regarding safety performance, schedule performance, federal and state governmental filings or reports, and project risk management activities. DEF will participate in quarterly meetings (or more frequent meetings if appropriate) to discuss project performance and any disputed payment request from ADPCR3. DEF will have a seat on the ADPCR3 board with veto rights on limited key decisions, such as resuming SAFSTOR strategy, voluntary filing for bankruptcy, and any amendment to the transaction documents that would alter DEF's rights.

"Pay item validation" comprises one aspect of the owners cost incurred for the decommissioning project. In connection with the project, DEF will validate ADPCR3's monthly request for reimbursement from the NDT. Per the DSA, each "Pay Item Schedule" specifies an agreed upon cost for defined scopes of the project, which DEF must validate as work is completed. Any reimbursements will be limited to these agreed upon costs and will require ADPCR3 to submit an invoice along with supporting documentation that the work being invoiced has been completed. Under the DSA, DEF will also have the right to access the CR3 Facility to verify that the work has been completed.

RESPONSE to subpart b.:

These "costs" are miscellaneous operating costs related to the Crystal River Energy Complex ("CREC"), such as site access control, road and vegetation management activities, and other infrastructure maintenance costs.

In addition to the CR3 Facility, other structures on the CREC include two permanently retired coal plants, two operational coal plants, two large cooling towers, coal delivery and storage areas, office areas, warehouses, barge handling areas, and a railroad.

RESPONSE to subpart c.:

The reference to "taxes" refers to Citrus County property taxes.

RESPONSE to subpart d.:

The reference to "fees" refers to any fees directly attributable to DEF and the CR3 Facility nuclear plant and which are not a contractual responsibility of ADP.

RESPONSE to subpart e.:

The "insurance costs" referred to are insurance premiums for American Nuclear Insurers ("ANI") and Nuclear Electric Insurance Limited ("NEIL"), net of participation and distribution credits as appropriate.

26. Please refer to the Direct Testimony of Terry Hobbs, Exhibit (TH-2), page 4 of 12. A portion of the second full paragraph on page 4 reads: "Based on the comparison between the DECON and SAFSTOR alternatives, DEF selected the DECON method." While a portion of the fifth paragraph reads: "Due to the change in methodology and contracting model and significant change in the timing and duration of decommissioning, a comparison of each cost element is not relevant. As such, DEF did not prepare a Comparison Report for the current study versus the 2018 estimate."

    a. Please identify any documents that the statement: "[b]ased on the comparison between the DECON and SAFSTOR alternatives, DEF selected the DECON method" is predicated upon.
    b. Has DEF provided a comparison of any specific cost element between the current and 2018 estimates as part of its Petition/filing in this proceeding?

RESPONSE to subpart a.:

The selection of the DECON method is predicated upon the confidential documents produced in DEF's response to Staff's Second Request for Production of Documents dated October 16, 2019. These documents communicate the outcome of the competitive bid process DEF used to determine that changing the CR3 Facility decommissioning strategy from SAFSTOR to DECON was prudent. The fixed price contract for decommissioning under the DECON method was compared to the 60-year cost study that supported the SAFSTOR method to serve as the basis for selecting the DECON method.

RESPONSE to subpart b.:

DEF did not prepare a comparison of any specific cost element between the current and the 2018 SAFSTOR cost study. DEF has provided a comparison of the bids received from the various vendors as part of DEF's response to Staff's Second Request for Production of Documents dated October 16, 2019. DEF also compared the fixed price contract's value, ADP's acceptance of projects risks, and the reduction in risks under the DECON method to the 60-year SAFSTOR cost study and the various risks under the SAFSTOR method.

27. Please refer to the Direct Testimony of Terry Hobbs, Exhibit (TH-2), page 6 of 12. Please further elaborate on the relationship between the disposal credit from Waste Control Specialists (WCS) in the amount of $30MM, and the 6 percent withholdings of "milestone payments" to Accelerated Decommissioning Partners (ADP). Please also identify any other performance provisions related to the relationship between the $30MM disposal credit and the 6 percent withholding associated with performance milestones.

RESPONSE:

ADP (the parent company of ADPCR3 and ADPSF1) is owned by two partners: NorthStar Group Services, Inc. ("NorthStar") (75% owner) and Orano Decommissioning Holdings, LLC (25% owner), a wholly owned subsidiary of Orano USA LLC ("Orano"). Both partners will provide parent company guarantees of all obligations of ADPCR3 and ADPSF1. ADPCR3 will establish a provisional trust fund for the benefit of the NDT with an initial cash deposit of $20 million. Six percent (6%) of each monthly milestone payment from the NDT will be retained in the provisional trust fund until the trust fund value increases from $20 million to $50 million. The $30 million waste disposal credit will provide additional financial value until the provisional trust fund reaches the $50 million amount. The $30 million waste disposal credit will gradually decrease as the provisional trust fund grows to $50 million.

28. Please refer to the Direct Testimony of Terry Hobbs, Exhibit (TH-2), page 6 of 12. A portion of the last paragraph on page 6 reads: "DEF will also fund [Accelerated Decommissioning Partners] for the purchase environmental accident insurance in the amount of approximately $30 million".

a. Please confirm the $30MM figure quoted above represents the limit of liability associated with the insurance policy.
b. Will this insurance policy be funded from the Nuclear Decommissioning Trust (NDT)? If not, please identify the source of funding for the policy.

RESPONSE to subpart a.:

The $30 million figure, as referenced in the Direct Testimony of Terry Hobbs, Exhibit (TH-2) as well as page 17, paragraph 48, of the Petition, was an approximate value of the environmental liability insurance to be purchased estimated around the time of filing the Petition. This figure has since been updated. The correct limit of liability associated with the insurance policy is $25 million.

RESPONSE to subpart b.:

Yes, this insurance policy will be funded from the NDT.

29. Please refer to the Direct Testimony of Terry Hobbs, Exhibit (TH-2), pages 6-7 of 12. A portion of the first (partial) paragraph on page 6 reads: "Any cost escalation for decommissioning is the responsibility of ADP and are expected to be funded by earnings from the NDT subaccount set aside for the ADP contract." Is staff correct that this statement only applies to any potential cost escalation within the currently-known scope of decommissioning work at the Crystal River Unit No. 3 (CR3) site?

RESPONSE:

The DSA is for a fixed price. ADP is assuming all project execution risk, including cost overruns or emergent conditions, which provides a high level of cost certainty to DEF customers.

There is one condition that is not solely the responsibility of ADP. The primary risks remaining with DEF are related to the site conditions at the completion of the decommissioning project, which are referred to as the end state conditions and which are required to terminate the NRC license. The first end state condition is related to the radiological criteria for unrestricted use of the property as defined in 10 C.F.R. 20.1402. This regulation requires that the residual radioactivity be reduced to an acceptable level during the decommissioning activities. The second risk is associated with the removal of

subterranean improvements after the first end state condition described above is met. The plan is to remove the walls of the structures to a nominal three feet below grade, fill the remaining decontaminated basements with fill material including clean concrete generated during the decommissioning activities, add a nominal three feet of fill dirt and add vegetation for erosion control purposes. DEF retains responsibility for any deviations in cost and to the schedule if either of these end state conditions change for any reason, including changes to regulations. In the event this would occur, DEF and ADPCR3 would discuss any deviations to the project and DEF could agree to provide additional funds to fund any resulting expanded scope of work. If the expanded scope of work is significant enough to stress available funding, then a decision could be made to return to a SAFSTOR condition. A return to a SAFSTOR condition would allow the remaining NDT funds to grow until the project could be completed within the 60-year time frame for decommissioning allowed by applicable regulations. DEF could also seek additional funds for the NDT from DEF customers and Duke Energy Corporation shareholders.

30. Please refer to the Direct Testimony of Terry Hobbs, Exhibit (TH-2), page 7 of 12. A portion of the fourth full paragraph on page 7 reads: "DEF would always have the option to return to SAFSTOR". Please elaborate on this statement while including a discussion regarding any potential engineering or regulatory limits of returning to SAFSTOR. As in, is there a physical "point of no return" during the decommissioning process where returning the plant to a state of SAFSTOR is no longer an option?

RESPONSE:

There are no limits or physical "point of no return" associated with returning to the SAFSTOR condition.

31. Please refer to the Direct Testimony of Terry Hobbs, Exhibit (TH-2), page 9 of 12.

a. Please list all rates of escalation, by year, associated with the "DEF Owner Cost (Escalated)" for the categories of "License Termination," and "Spent Fuel Management."
b. Please identify the source(s) of the escalation rates applied to the "DEF Owner Cost (Escalated)" values.

RESPONSE to subpart a.:

Please see the following table:

	License Termination	Spent Fuel Management
2019	2.64%	2.64%
2020	2.64%	2.64%
2021	2.64%	
2022	2.64%	
2023	2.64%	
2024	2.64%	
2025	2.64%	
2026	2.64%	
2027	2.64%	
2028	2.64%	
2029	2.64%	
2030	2.64%	
2031	2.64%	
2032	2.64%	
2033	2.64%	
2034	2.64%	
2035	2.64%	
2036	2.64%	
2037	2.64%	
2038	2.64%	

RESPONSE to subpart b.:

The escalation rate of 2.64% used for all years of escalated DEF owner costs in Exhibit (TH-2), page 9 of 12, was obtained from the "Financial Escalation Analysis-2017 Site Specific Estimate for Crystal River Unit 3" prepared by TLG Services, Inc. in 2018. This rate is the Single Value Escalation Rate calculated by TLG Services, Inc. for "Total Costs," which takes into consideration all categories of decommissioning spending.

32. Please refer to the Direct Testimony of Terry Hobbs, Exhibit (TH-2), page 11 of 12. Please list the relative fund amounts associated with the assumed rates of return shown on this page of Exhibit (TH-2).

RESPONSE:

Please see the following table:

Assumed Earnings Rates:	5.39%	2.45%	1.86%	
Beginning Period Balances	Pre Tax, Risked Qualified Fund	Pre Tax, De-Risked Qualified Fund	After-Tax, De-Risked Non-Qualified Fund	Total
2019	696,817,432	2,675,111	-	699,492,543
n1. 2020	101,657,442	3,103,995	-	104,761,437
2021	105,790,345	1,174,545	-	106,964,890
2022	110,091,272	0	90,000,000	200,091,272
n2. n3. 2023	114,567,054	0	89,597,675	204,164,728
2024	119,224,799	0	89,133,051	208,357,850
2025	124,071,907	0	88,603,523	212,675,430
2026	129,116,074	0	88,006,399	217,122,472
2027	134,365,313	0	88,133,033	222,498,346
2028	139,827,960	0	88,222,152	228,050,112
2029	145,512,693	0	88,272,004	233,784,697
2030	150,821,590	0	88,280,779	239,102,370
2031	157,330,457	0	88,246,604	245,577,061
2032	164,120,221	0	88,167,542	252,287,763
2033	171,203,005	0	88,041,589	259,244,594
2034	178,591,454	0	87,866,674	266,458,128
2035	186,298,759	0	87,640,657	273,939,416
2036	194,338,682	0	87,361,322	281,700,004
2037	202,725,576	0	87,026,382	289,751,958
2038	211,474,415	0	86,977,948	298,452,363

Notes:

1. **Note 1. Includes transferring $540 million to a subaccount.**
2. **Note 2. Assumes estimated proceeds from DOE resolution.**
3. **Note 3. Assumes non-qualified funds are used first for withdrawals.**

33. Does DEF's Decommissioning Services Agreement (DSA) with ADP contemplate any credit values for scrap metals? If so, please provide the estimated value of scrap metals

and briefly discuss how DEF estimated the value. Please also specify which entity will retain any potentially recovered value.

RESPONSE:

No. ADP incorporated potential salvage value of scrap metals into its fixed price bid. Attachment 1 of the DSA states "Contractor may recycle, reclaim or otherwise salvage materials that meet the "free release" criteria established at the CR3 Facility. Contractor shall implement a process for this verification and maintain documentation of same. Any and all value obtained for salvaged or scrapped materials remain with Contractor."

34. Please specify the current Nuclear Regulatory Commission (NRC) minimum decommissioning fund requirement for CR3.

RESPONSE:

The NRC minimum decommissioning funding requirements for all power reactors, including the CR3 Facility, are specified in 10 CFR 50.75, "Reporting and recordkeeping for decommissioning planning." Specifically, 10 CFR 50.75(b) and (c) state:

> "(b) Each power reactor applicant for or holder of an operating license, and each applicant for a combined license under subpart C of 10 CFR part 52 for a production or utilization facility of the type and power level specified in paragraph (c) of this section shall submit a decommissioning report, as required by § 50.33(k).
>
> (1) For an applicant for or holder of an operating license under part 50, the report must contain a certification that financial assurance for decommissioning will be (for a license applicant), or has been (for a license holder), provided in an amount which may be more, but not less, than the amount stated in the table in paragraph (c)(1) of this section adjusted using a rate at least equal to that stated in paragraph (c)(2) of this section. For an applicant for a combined license under subpart C of 10 CFR part 52, the report must contain a certification that financial assurance for decommissioning will be provided no later than 30 days after the Commission publishes notice in the **Federal Register** under § 52.103(a) in an amount which may be more, but not less, than the amount stated in the table in paragraph (c)(1) of this section, adjusted using a rate at least equal to that stated in paragraph (c)(2) of this section.
>
> (2) The amount to be provided must be adjusted annually using a rate at least equal to that stated in paragraph (c)(2) of this section.

(3) The amount must be covered by one or more of the methods described in paragraph (e) of this section as acceptable to the NRC.

(4) The amount stated in the applicant's or licensee's certification may be based on a cost estimate for decommissioning the facility. As part of the certification, a copy of the financial instrument obtained to satisfy the requirements of paragraph (e) of this section must be submitted to NRC; *provided, however*, that an applicant for or holder of a combined license need not obtain such financial instrument or submit a copy to the Commission except as provided in paragraph (e)(3) of this section.

(c) Table of minimum amounts (January 1986 dollars) required to demonstrate reasonable assurance of funds for decommissioning by reactor type and power level, P (in MWt); adjustment factor.[1]

		Millions
(1)(i) For a PWR:	greater than or equal to 3400 MWt	$105
	between 1200 Mwt and 3400 Mwt (For a PWR of less than 1200 Mwt, use P=1200 Mwt)	$(75+0.0088P)
(ii) For a BWR:	greater than or equal to 3400 MWt	$135
	between 1200 Mwt and 3400 Mwt (For a BWR of less than 1200 Mwt, use P=1200 MWt)	$(104+0.009P)

(2) An adjustment factor at least equal to 0.65 L + 0.13 E + 0.22 B is to be used where L and E are escalation factors for labor and energy, respectively, and are to be taken from regional data of U.S. Department of Labor Bureau of Labor Statistics and B is an escalation factor for waste burial and is to be taken from NRC report NUREG-1307, 'Report on Waste Burial Charges.'"

"[1] Amounts are based on activities related to the definition of "Decommission" in § 50.2 of this part and do not include the cost of removal and disposal of spent fuel or of nonradioactive structures and materials beyond that necessary to terminate the license."

The formula provided in 10 CFR 50.75(c) does not reflect the actual cost of decommissioning but is intended to demonstrate that the bulk of funds necessary for decommissioning will be available. Furthermore, the formula only covers decommissioning activities, which do not include spent fuel management and site restoration activities.

Based on the formula provided in 10 CFR 50.75(c), DEF calculated the minimum decommissioning amounts required for the CR3 Facility. The calculated minimum amount required was $474,162,767. DEF reported this figure to the NRC in the Crystal River Unit

3 - Annual Decommissioning and Irradiated Fuel Management Financial Status Report dated March 27, 2019.

35. Please explain how DEF is complying with NRC requirements as they pertain to management of the investments in the decommissioning trust fund.

RESPONSE:

DEF ensures compliance with NRC requirements pertaining to the management of decommissioning trust fund investments through the use of guidance provided in NRC Regulatory Guide (RG) 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors." This guidance addresses requirements for the content of the trust agreement, including the obligations of the trustee and any investment manager with respect to investments. In the case of licensees that are subject to traditional cost of service rate-making regulation, which includes DEF, the NRC has not imposed investment restrictions because other regulatory authorities, including State Public Utility Commissions and the Federal Regulatory Commission (FERC), have oversight of decommissioning funds. Based on FERC requirements, DEF's trust agreement requires any investment manager to adhere to the "prudent investor" standard as specified in 18 CFR 35.32(a)(3).

36. Please explain whether DEF has requested any exceptions to the NRC guidelines on decommissioning reserves. If so, please provide copies of any related correspondence to or from the NRC regarding this matter.

RESPONSE:

One exemption request regarding the use of decommissioning trust funds was submitted by DEF and approved by the NRC. The exemption request was submitted to the NRC on March 28, 2014, requesting exemption from 10 CFR 50.82(a)(8)(i)(A) and 10 CFR 50.75(h)(2) to allow decommissioning trust funds held by DEF and the co-owners (at that time) to be used for spent fuel management and site restoration activities, and to allow disbursements from the fund for these purposes without prior notification to the NRC. The NRC approved this exemption request on January 26, 2015 based on a determination of reasonable assurance that sufficient financial resources were available in the decommissioning trust fund for both spent fuel management and site restoration activities, as well as to complete decommissioning activities.

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37. Please provide a detailed breakdown of the trust fund portfolio by type of securities held, maturity composition (average maturity), credit rating of fixed income investments, and other relevant categories.

RESPONSE:

Duke Energy Florida	As of October 31, 2019
n1. U.S. Equity Manager	**425,884,036**
n2. U.S. Equity Options Hedge Mark-to-Market	**(7,514,979)**
n3. Fixed Income Manager	**303,636,103**
Cash and Miscellaneous	**1,684,279**
Total	**723,689,439**

Notes:

1. **Note 1. Includes investments in small, mid, and large-cap U.S. equities (managed to Russell 3000 Index) and cash.**
2. **Note 2. Options were entered into to hedge the U.S. equity portfolio and have been effective at limiting volatility, with option values partially offsetting portfolio gains.**
3. **Note 3. Please see the "Qualified NDT Fixed Income – CR 3" document with security characteristics, dated as of November 2019, attached hereto as Exhibit No. (ROG 37). Because the portfolio earnings from the table above were provided to DEF by a third party fixed income investment manager, while Exhibit No. (ROG 37) was provided by a different third party, the investment consultant, the dates the figures were calculated vary and therefore, there are discrepancies between the dollar figures set forth in the table above and the dollar figures in Exhibit No. (ROG 37).**

38. Please refer to the Direct Testimony of Terry Hobbs, Exhibit (TH-2), page 6 of 12. A portion of the first full paragraph on this page reads: "ADP has accepted responsibility for NDT performance of the funds placed in the designated decommissioning subaccount (for the contract value) and has requested that DEF 'de-risk' or lower the risk profile for the subaccount by investing in treasury securities."

a. Please define the term "de-risk" as used in this context.
b. Would the aforecited quote remain the case in a possible future "negative treasury interest rate" environment?
c. Given that DEF retains ownership and sole access to the NDP, what is the recourse, if any, for DEF's customers in the event the "ADP subaccount" funds do not earn at a rate equal or greater than the prevailing Consumer Price Index?

RESPONSE to a.:

"De-risk" in this context is referring to eliminating or minimizing both the counter-party risk and market risk of the NDT security portfolio. ADP does not consider securities backed by the U.S. Government to have counter-party risk for this purpose, and market risk is minimized by matching security duration to expected project draws, with the intent to hold securities to maturity once purchased.

RESPONSE to b.:

No, the portfolio strategy would be revisited if market rates on Treasury securities became negative before the portfolio was fully invested. It should be noted that this scenario is only relevant for the period prior to transaction approval and initial portfolio investment. Once the initial NDT investments are in place, ADP would be protected from a move to negative interest rates by holding securities to maturity and would consider options to accelerate work to benefit from the large capital gain generated by that sort of change in interest rates.

RESPONSE to c.:

There is no recourse for DEF's customers related to the performance of the funds in the ADP subaccount. ADP is responsible for the investment performance associated with the funds in the ADP subaccount. All subaccount earnings (or losses) are to the benefit (or detriment) of ADP. Regardless of the subaccount investment performance, ADP is still obligated to complete the decommissioning project for the fixed price.

39. A portion of the second full paragraph on page 6 reads: "In May of 2019, DEF implemented a hedging strategy that protects the NDT from downside market risk. This 'zero cost collar' strategy ensures that the NDT value will not be less than estimated decommissioning costs."

    a. Please further elaborate on/provide specifics as to the "hedging strategy that protects the NDT from downside market risk."
    b. Which specific decommissioning costs are being referred to by the statement: "[t]his zero cost collar strategy ensures that the NDT value will not be less than estimated decommissioning costs."

RESPONSE to a.:

The purpose of the hedging strategy was to preserve the value needed to successfully close the accelerated decommissioning transaction. The hedge was designed to provide a floor to the value of the NDT at $610 million. This would enable DEF to fund the ADP contract, operating costs, and provide contingency.

The strategy was executed in two stages. The first stage was to liquidate the fixed income and international equity portfolios. With these executions we were able to limit market risk while incurring minimal taxes. The cash was then invested in U.S. Treasury bonds with a maturity date close to the expected accelerated decommissioning transaction close date. The second stage was intended to preserve the value of the U.S. equity portfolio without liquidating the portfolio and thus, potentially, unnecessarily realizing gains. We were able to limit the volatility of the U.S. equity portfolio by simultaneously entering into zero cost U.S. equity options, which established a range for the value of the portfolio (floor and cap).

RESPONSE to b.:

The hedge was designed to provide a floor to the value of the NDT at $610 million. This would enable DEF to fund the ADP contract, DEF operating costs until closing, and to provide for contingency costs. Such costs are the estimated decommissioning costs referred to by the statement.

40. Given that the funding status of DEF's decommissioning strategy is partially dependent on assumed fund escalation rates, please explain why DEF believes its assumed "NDT (DEF Reserve)" escalation rates shown on Exhibit (TH-2), page 11 of 12, are appropriate to use in this proceeding.

RESPONSE:

The funding status of the decommissioning strategy is based on a fixed price from ADP. DEF will create a subaccount within the NDT to fund the fixed price. Any earnings on the funds in this subaccount are a risk to ADP; however, per the contract, the proceeds will be invested in U.S. government securities and cash, both of which are viewed as low risk investments.

The NDT has funds beyond the amount required to pay for the ADP fixed price contract, which funds will be held within a second distinct subaccount. DEF believes the assumed rates of return on these "reserve" funds are reasonable as they are based on a portfolio investment strategy consistent with DEF's historical investment strategy.

AFFIDAVIT

STATE OF FLORIDA)

COUNTY OF Citrus)

I hereby certify that on this 10th day of December, 2019, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared Kerry Hobbs, who is personally known to me, and he/she acknowledged before me that he/she provided the answers to interrogatory number(s) 21-30, 33-36, 38 c. from STAFF'S FOURTH SET OF INTERROGATORIES TO DUKE ENERGY FLORIDA, LLC. (NOS. 21-40) in Docket No(s) 20190140-EI, and that the responses are true and correct based on his/her personal knowledge.

In Witness Whereof, I have hereunto set my hand and seal in the State and County aforesaid as of this 10th day of December, 2019.

CAROLLE BUTLER
Notary Public-State of Florida
Commission # GG 356655
My Commission Expires
July 18, 2023

Carolle Butler

Notary Public CAROLLE BUTLER
State of Florida, at Large

My Commission Expires:
7.18.2023

AFFIDAVIT

STATE OF NEW YORK)

COUNTY OF NEW YORK)

I hereby certify that on this 16th day of December, 2019, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared Scott E. State, who is _____ personally known to me, or has produced his ✓ driver's license, ____ or his _____ as identification, and he acknowledged before me that he provided the answers to interrogatory number 38, subparts a. and b., from STAFF'S FOURTH SET OF INTERROGATORIES TO DUKE ENERGY FLORIDA, LLC. (NOS. 21-40) in Docket No(s) 20190140-EI, and that the responses are true and correct based on his personal knowledge.

In Witness Whereof, I have hereunto set my hand and seal in the State and County aforesaid as of this 16th day of December, 2019.

Notary Public
State of New York, at Large

My Commission Expires:
09/08/2022

Stephanie Ng
Notary Public - State of New York
County of Queens
Commission No. 01NG6013004
My commission expires: 09/08/2022

AFFIDAVIT

STATE OF NORTH CAROLINA)

COUNTY OF Lincoln)

I hereby certify that on this 20th day of December, 2019, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared David L. Doss, Jr., who is _____ personally known to me, or has produced his ✓ driver's license, ____ or his _____ as identification, and he acknowledged before me that he provided the answers to interrogatory number(s) 31, 32, 37, 39, and 40 from STAFF'S FOURTH SET OF INTERROGATORIES TO DUKE ENERGY FLORIDA, LLC. (NOS. 21-40) in Docket No(s) 20190140-EI, and that the responses are true and correct based on his personal knowledge.

In Witness Whereof, I have hereunto set my hand and seal in the State and County aforesaid as of this 20th day of December, 2019.

DOUGLAS P KUSH NOTARY PUBLIC GASTON COUNTY, NC My Commission Expires August 23, 2020

Notary Public
State of North Carolina, at Large

My Commission Expires:
8.23.2020

Portfolio Holdings - November 2019

Qualified NDT Fixed Income - CR 3

ASSET ID	QUANTITY	SECURITY DESCRIPTION	COUPON	MATURITY	PRICE	MDY/S&P/FITCH	YIELD	NISA DUR[1]	INDEX DUR[2]	CTD	MARKET VALUE	%MV
CASH EQUIVALENT SECURITIES												
912828UF5	1,480,000	UST NOTE	1.125	12/31/19	99.945	Aaa/AA+/AAA	1.79	0.08	0.08	0.00	1,486,158	0.49
912828UL2	1,470,000	UST NOTE	1.375	01/31/20	99.953	Aaa/AA+/AAA	1.65	0.17	0.17	0.00	1,476,067	0.49
912828ND8	2,245,000	UST NOTE	3.500	05/15/20	100.828	Aaa/AA+/AAA	1.67	0.45	0.45	0.00	2,267,045	0.75
9128284Q0	270,395,000	UST NOTE	2.500	05/31/20	100.406	Aaa/AA+/AAA	1.68	0.49	0.49	0.44	271,511,949	89.67
	275,590,000		**CASH EQUIVALENT SECURITIES**			Aaa/AAA/AAA	1.68	0.49	0.49	0.45	276,741,220	91.40
			FIXED INCOME SECURITIES								276,741,220	
			CASH				1.57	0.00	0.00	0.00	26,053,281	8.60
			PORTFOLIO TOTAL & AVERAGES			Aaa/AAA/AAA	1.67	0.45	0.45	0.45	302,794,501	100.00

[1] NISA duration is the modified duration as calculated by NISA based on up- and downward shocks to a security's yield-to-maturity.

[2] Index provider duration is the modified adjusted duration as provided by Bloomberg Index Services Ltd. Bloomberg Index Services Ltd. calculates these durations based on up- and downward shocks to a Treasury par curve. For average portfolio duration calculation purposes, modified duration calculated by NISA is used where Bloomberg Index Services Ltd.'s modified adjusted duration is not provided.

With respect to Bloomberg Barclays index data in this presentation – Source: Bloomberg Index Services Ltd. © 2019 Bloomberg Index Services Ltd. Used with permission. Bloomberg is a registered trademark of Bloomberg Finance L.P. and its affiliates.

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DEF's Responses to Staff's Fifth Set of Interrogatories, Nos. 42, 44, 48-49, 51,and 52.

Including Supplemental Responses.

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 23
PARTY: STAFF HEARING EXHIBITS
DESCRIPTION: Terry Hobbs

February 20, 2013. The CR3 operating license is in effect in accordance with 10 CFR 50.51, Continuation of license, which includes:

> **"(a) Each license will be issued for a fixed period of time to be specified in the license but in no case to exceed 40 years from date of issuance. Where the operation of a facility is involved, the Commission will issue the license for the term requested by the applicant or for the estimated useful life of the facility if the Commission determines that the estimated useful life is less than the term requested. Where construction of a facility is involved, the Commission may specify in the construction permit the period for which the license will be issued if approved pursuant to § 50.56. Licenses may be renewed by the Commission upon the expiration of the period. Renewal of operating licenses for nuclear power plants is governed by 10 CFR part 54. Application for termination of license is to be made pursuant to § 50.82.**
>
> **(b) Each license for a facility that has permanently ceased operations, continues in effect beyond the expiration date to authorize ownership and possession of the production or utilization facility, until the Commission notifies the licensee in writing that the license is terminated. During such period of continued effectiveness the licensee shall—**
>
> **(1) Take actions necessary to decommission and decontaminate the facility and continue to maintain the facility, including, where applicable, the storage, control and maintenance of the spent fuel, in a safe condition, and**
>
> **(2) Conduct activities in accordance with all other restrictions applicable to the facility in accordance with the NRC regulations and the provisions of the specific 10 CFR part 50 license for the facility."**

Additional information concerning license termination can be found at NRC.gov and in 10 CFR 50.82, Termination of license.

42. PSC Rule 25-6.04365(3)(b), F.A.C., requires a list of all entities owning an interest in each nuclear unit, the percentage of ownership by each entity, and documentation showing the status of each entity in providing its share of the total decommissioning costs. Please provide aforementioned list regarding CR3.

RESPONSE:

Duke Energy Florida is the 100% owner of the Crystal River nuclear unit. While Duke Energy Florida previously had joint owners, it bought back all interests. The City of Tallahassee currently maintains a nuclear decommissioning trust fund to fund its portion of the decommissioning costs. Documentation showing these breakdowns can be found in the PSDAR, which was previously produced in response to request numbers 2, 4, and 6 of Staff's First Request for Production of Documents, at Bates number DEF RESP STAFF 1ST POD – 000003 through DEF RESP STAFF 1ST POD – 000024.

44. PSC Rule 25-6.04365(3)(g), F.A.C., requires the amounts of qualified and nonqualified funding for each year since the last decommissioning study be provided. Please provide that information regarding CR3. Also include the method assumed in the calculation of the proposed annual accrual. Please see page 8 of Section 1 of DN 01262-14, Duke's 2014 Decommissioning Study, as an example.

RESPONSE:

The decommissioning method used in the current calculations is the DECON method. The qualified and nonqualified trust fund balances, including unrealized gains/losses, for each year since the prior study are included in the following chart:

	Qualified Fund Balance	Non-Qualified Fund Balance
12/31/2014	$ 802,568,259	$ 297,132
12/31/2015	$ 685,203,441	$ 55,079,279
12/31/2016	$ 695,072,315	$ 20,115,383
12/31/2017	$ 735,657,403	$ 280,747
12/31/2018	$ 658,816,104	$ 284,818

45. PSC Rule 25-6.04365(3)(h), F.A.C., requires the jurisdictional and non-jurisdictional decommissioning cost estimates in current dollars be provided. Please provide those estimates regarding CR3.

RESPONSE:

Please see page 9 of 12 of Exhibit No._ (TH-2). Please also see Enclosure 4, Schedule & Financial Information for Decommissioning, which was included in the License Transfer Application submitted to the NRC in June of 2019, and previously produced in response to Interrogatory No. 1 of Staff's First Request for Production of Documents (Nos. 1-7), at Bates numbers DEF RESP STAFF 1ST POD – 000202 through DEF RESP STAFF 1ST POD - 000206.

46. PSC Rule 25-6.04365(3)(i), F.A.C., requires the jurisdictional and non-jurisdictional decommissioning cost estimates in future dollars be provided. Please provide those estimates regarding CR3.

RESPONSE:

Please see DEF's response to Interrogatory Number 45.

47. PSC Rule 25-6.04365(3)(k), F.A.C., requires that the utility includes the projected date each nuclear unit will no longer be included in rate base for ratemaking purposes. Please provide this information regarding CR3.

RESPONSE:

The Crystal River nuclear plant assets were removed from the DEF rate base in 2012.

48. PSC Rule 25-6.04365(3)(n), F.A.C., requires that the utility provide the methodology and escalation rate used in converting the current estimated decommissioning costs to future estimated decommissioning costs and supporting documentation and analyses. Please provide this information regarding CR3.

RESPONSE:

An escalation rate of 2.64% was used for all years of escalated DEF owner costs. This rate was obtained from the "Escalation Analysis for the Crystal River Unit 3 Nuclear Generating Plans 2017 Site-Specific Decommissioning Cost Estimate" prepared by TLG Services, Inc. in 2018 (the "TLG Report"). This rate is the overall "Composite Average Annual Rate (%)" calculated by TLG Services, Inc. for total decommissioning costs, which takes into consideration all categories of decommissioning costs. The TLG Report, which includes the assumptions and methodology used, has been included as Bates Nos. DEF RESP STAFF 5TH ROG – 000329 through DEF RESP STAFF 5TH ROG – 000346.

49. PSC Rule 25-6.04365(3)(p), F.A.C., requires a reconciliation of the decommissioning fund balance and reserve balance by category. Please provide

those balances. See Section 2, Table 2.1, pages 1-3 of DN 01262-14, Duke's 2014 Decommissioning Study, as an example.

RESPONSE:

The 2014 Decommissioning Study was prepared for a 60-year period. The 2019 Accelerated Nuclear Decommissioning Cost Study is based on a 19-year period, a firm-fixed contact amount, and the estimated annual cost per category (license termination, spent fuel management and site restoration). Please see Section 2, page 1 of 2, of the 2019 Accelerated Nuclear Decommissioning Cost Study, as set forth on page 9 of 12 of Exhibit No._ (TH-2).

50. PSC Rule 25-6.04365(3)(q), F.A.C., requires that the utility provide a summary and explanation of material differences between the current study and the utility's last filed study including, at minimum, changes in methodology and assumptions. DEF's Study, included in witness Hobbs testimony, Exhibit No._ (TH-2), page 3 of 12, states that there are "significant changes" to the cost estimate completed in 2018. Please summarize these changes as well as changes in the methodology and assumptions used to obtain that estimate.

RESPONSE:

Please see the following excerpt from page 4 of 12 of Exhibit No._ (TH-2):

The analysis shows that the total cost to decommission under DECON is $617M, which is $278.9M lower than the cost under the 2018 SAFSTOR estimate of $895.9M. Note however, that this analysis is not a direct comparison as the decommissioning in the 2018 SAFSTOR estimate was assumed to take place from 2018 through 2074 versus the current DECON study, which has decommissioning occurring from 2020 through 2038. Costs to reach SAFSTOR dormancy (previous spend) from the 2018 estimate are excluded from this study. The DECON alternative, based upon the contract structure with ADP, does not include spent fuel management costs. Additionally, the contract with ADP is a different contracting model that significantly reduces utility staff requirements/DEF management costs, as well as transfers responsibility for emergent issues and related costs to ADP. Note that ADP expects to recover their spent fuel management costs from the DOE.

Due to the change in methodology and contracting model selected and significant change in the timing and duration of decommissioning, a comparison of each cost element is not relevant. As such, DEF did not prepare a Comparison Report for the current study versus the 2018 estimate.

51. PSC Rule 25-6.04365(3)(r), F.A.C., requires that the utility provides supporting schedules, analyses, and data, including the contingency allowance, used in developing the decommissioning cost estimates and annual accruals proposed by DEF. This rule further requires that inflation and funding analyses be included in the supporting schedules. Please provide this information regarding CR3.

RESPONSE:

The project contingency funds are included in the fixed-price contract value. The schedule and cost information, as well as inflation and funding requirements, are all included in the 2019 Accelerated Nuclear Decommissioning Cost Study. Since the 2019 Accelerated Nuclear Decommissioning Cost Study is based on a fixed price contract signed after a thorough competitive bid process, no additional schedules, analyses, and data is available, other than the documents produced on October 16, 2019 in DEF's response to request numbers 8, 11, 12, and 13 of the Staff's Second Request for Production of Documents (Nos. 8-14).

52. DEF's study, included in witness Hobbs testimony, Exhibit No._ (TH-2), page 7 of 12, states that in the occurrence of an extreme event, a remedy DEF could pursue is seeking additional funding from customers and shareholders. Please explain the process by which additional funds will be recovered from the customers/shareholders in the scenario of an extreme event. Please also explain what threshold would initiate this process.

RESPONSE:

If DEF determines that the current NDT balance is insufficient to cover the expected cost of decommissioning, and the other contractual remedies against ADP have been exhausted, such that additional funds are needed from customers, DEF would file a petition with the FPSC requesting that the Commission authorize an accrual to be collected from customers for the retail portion. The shareholder portion would be funded by the Company and would not be recovered from customers. If the event occurs during the term of the current 2017 Settlement, then DEF would comply with the provisions of paragraph 7. There is no monetary threshold as to when this process would be initiated; rather, it would occur if DEF determines that the expected cost of decommissioning has increased such that the NDT is not sufficiently funded. All parties that demonstrate appropriate standing would have full rights to participate in that future proceeding.

AFFIDAVIT

STATE OF NORTH CAROLINA)

COUNTY OF Mecklenburg)

I hereby certify that on this 2 day of January, 2019, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared David L. Doss, Jr., who is ✓ personally known to me, ~~or has produced his ___ driver's license, ___ or his ___ as identification~~, and he acknowledged before me that he provided the answers to interrogatory number(s) 44 and 48, from STAFF'S FIFTH SET OF INTERROGATORIES TO DUKE ENERGY FLORIDA, LLC. (NOS. 41-53) in Docket No(s) 20190140-EI, and that the responses are true and correct based on his personal knowledge.

In Witness Whereof, I have hereunto set my hand and seal in the State and County aforesaid as of this 2 day of January, 2019.

Kim V. Beal
Notary Public
State of North Carolina, at Large

Kim V Beal
Notary Public
Catawba County
NORTH CAROLINA

My Commission Expires:
October 24, 2024

AFFIDAVIT

STATE OF FLORIDA)

COUNTY OF Citrus)

I hereby certify that on this 10th day of December, 2019, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared Terry Hobbs, who is personally known to me, and he/she acknowledged before me that he/she provided the answers to interrogatory number(s) 41-43, 45-47, 49-53 from STAFF'S FIFTH SET OF INTERROGATORIES TO DUKE ENERGY FLORIDA, LLC. (NOS. 41-53) in Docket No(s) 20190140-EI, and that the responses are true and correct based on his/her personal knowledge.

In Witness Whereof, I have hereunto set my hand and seal in the State and County aforesaid as of this 10th day of December, 2019.

Carolle Butler

Notary Public CAROLLE BUTLER
State of Florida, at Large

CAROLLE BUTLER
Notary Public-State of Florida
Commission # GG 356655
My Commission Expires
July 18, 2023

My Commission Expires:
7/18/2023

ESCALATION ANALYSIS

for the

CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT

2017 SITE-SPECIFIC DECOMMISSIONING COST ESTIMATE

prepared for

Duke Energy Florida LLC

prepared by

TLG Services, Inc.
Bridgewater, Connecticut

June 2018

APPROVALS

Project Engineer	**DRAFT**	
	Leasa A. Goetchius	**Date**
Project Manager	**DRAFT**	
	William A. Cloutier, Jr.	**Date**
Technical Manager	**DRAFT**	
	Francis W. Seymore	**Date**

20190140.EI Staff Hearing Exhibits 00048

REVISION LOG

No.	Date	Item Revised	Reason for Revision
A	6-05-2018		Draft Issue

20190140.EI Staff Hearing Exhibits 00049

DECOMMISSIONING COST ESCALATION STUDY

Purpose

This report presents escalated costs for the estimates of the costs to decommission the Crystal River Unit 3 Nuclear Generating Plant (CR-3) for the SAFSTOR decommissioning scenario using dry fuel storage. The estimate, escalated to the year of expenditure dollars, is designed to provide Duke Energy Florida LLC (DEF), formerly known as Florida Power Corporation, with the information to assess its current decommissioning liability, as it relates to CR-3.

Basis

The Crystal River Unit 3 Nuclear Generating Plant (CR-3) has been safely shut down since September 26, 2009, when the plant entered the Cycle 16 refueling outage to replace the steam generators. As of May 28, 2011, all fuel assemblies were removed from the reactor vessel and placed in the spent fuel pool for temporary storage. Certification of the permanent cessation of power operations and defueling was submitted to the Nuclear Regulatory Commission (NRC) on February 20, 2013.

Duke Energy Florida LLC has announced its intention to decommission under the SAFSTOR alternative. The currently projected total cost to decommission the nuclear unit, assuming the SAFSTOR alternative, is estimated at $896 million,[1] as reported in 2017 dollars. The cost includes the monies anticipated to be spent for operating license termination (radiological remediation), interim spent fuel storage and site restoration activities. The cost is based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency) and site remediation and restoration requirements. The planned decommissioning activities, the associated sequence and schedule, and the estimate of expected costs were included in a Post-Shutdown Decommissioning Activities Report submitted to the Nuclear Regulatory Commission (NRC) on December 2, 2013.

The site-specific cost estimate was prepared by TLG Services, Inc. (TLG) in year-end 2017 (i.e., nominal) dollars. Because the actual decommissioning will not occur for many years and may continue for decades, the nominal-dollar estimates must be escalated into the year of expenditure. That is, we must determine the dollar value of each year's expenditure at the time it is expected to be incurred. Those escalated dollars then provide the basis for financial planning and asset management.

1 "Updated Site-Specific Decommissioning Cost Estimate for the Crystal River Unit 3 Nuclear Generating Plant," Document No. D03-1744-001, Rev. 0, TLG Services, Inc., May 2018

20190140.EI Staff Hearing Exhibits 00050

Because many of the decommissioning activities occur long in the future, small fluctuations in escalation on the cost side, and investment earnings on the trust balance side, have an exponential impact on the resources required over the long periods of time associated with most decommissioning scenarios.

In this analysis, TLG reviewed each applicable cost component separately to determine the rate by which each component was expected to escalate annually and, using an accepted aggregation methodology, determined that the decommissioning costs. – in aggregate – were expected to escalate annually at a composite rate of 2.64%.

The following narrative describes the methodology used to escalate the schedule of decommissioning expenditures.

Background

TLG developed the cost to decommission CR-3 in year-end 2017 dollars; the mathematics to transform those costs to the year in which they will actually be incurred is relatively straightforward. The key to the analysis is selecting the appropriate forecasting indices for each of the major cost components. For that, TLG has relied upon guidance from the NRC and the industry-wide recognized expertise of IHS- Markit.

The NRC divides its reference costs for decommissioning into categories of labor, energy, and Low Level Radioactive Waste (LLRW) disposal. To provide guidance to operators and regulators and promote uniformity, the NRC periodically reissues NUREG-1307, "Report on Waste Burial Charges." NUREG-1307 is helpful in that it identifies the appropriate indices that should be used to escalate the labor and energy cost components and provides historical changes in low level radioactive waste disposal costs.

TLG also allocates its costs for decommissioning into categories, with the NRC's labor category further subdivided into "labor" and "equipment and materials," and an "other" category added for regulatory fees, property taxes and other unique or one-time expenditures.

Consistent with standards defined in the Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC), Topic 410-20,[2] TLG develops

[2] Accounting Standards Codification, Topic 410-20, Financial Accounting Standards Board, July 2009.

20190140.EI Staff Hearing Exhibits 00051

future cash flows by escalating four of the cost categories (labor, equipment and materials, energy and other) with indices provided by IHS-Markit of Lexington, MA. IHS-Markit is a privately held company which acquired Global Insight in 2008. The combined company includes well-known businesses such as Cambridge Energy Research Associates (CERA), Jane's Information Group, and IHS Herold; it also includes the former companies known as DRI (Data Resources, Inc.) and WEFA (Wharton Econometric Forecasting Associates).

IHS-Markit has no direct index for escalation of low level radioactive waste disposal costs. The inflation index used for radioactive waste burial costs is the IHS-Markit Consumer Price Index, with an additional 1% per year to account for the historical difference between low-level waste disposal rates reported in NRC NUREG-1307 documents and inflation rates reported by the Bureau of Labor Statistics (CPI).

Since the timeframe of decommissioning typically exceeds that of the published indices, for years beyond the published index, the inflation factor is determined using a "moving-average" method, averaging the most recent 25 years of indices to determine the future year index. This is a well-accepted methodology for determining longer-term projections and one that has been reviewed and deemed appropriate by IHS-Markit as well.

Assumptions and Methodology

The base year (2017) costs were extracted from the "Site-Specific Decommissioning Cost Estimate for the Crystal River Unit 3 Nuclear Generating Plant," issued in May 2018.

The decommissioning approach that has been selected by DEF for CR-3 is the SAFSTOR method. The primary objectives of the CR-3 decommissioning project are to remove the facility from service, reduce residual radioactivity to levels permitting unrestricted release, restore the site, perform this work safely, and complete the work in a cost effective manner. The selection of a preferred decommissioning alternative is influenced by a number of factors. These factors include the cost of each decommissioning alternative, minimization of occupational radiation exposure, availability of low-level waste disposal facilities, availability of a high-level waste (spent fuel) repository or Department of Energy (DOE) interim storage facility, regulatory requirements, and public concerns. In addition, 10 CFR 50.82(a)(3) requires decommissioning to be completed within 60 years of permanent cessation of operations.

ASC 410-20-55-14 states: "It is expected that uncertainties about the amount and timing of future cash flows can be accommodated by using the expected present value technique and therefore will not prevent the determination of a reasonable estimate of fair value."

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Under the SAFSTOR methodology, the facility is placed in a safe and stable condition and maintained in that state, allowing levels of radioactivity to decrease through radioactive decay, followed by decontamination and dismantlement. After the safe storage period, the facility will be decontaminated and dismantled to levels that permit license termination. In accordance with 10 CFR 50.82(a)(9), a license termination plan will be developed and submitted for NRC approval at least two years prior to termination of the license.

An Independent Spent Fuel Storage Installation (ISFSI) has been constructed adjacent to the power block. The spent fuel has been relocated from the auxiliary building to the ISFSI to await transfer to a DOE facility. Assuming priority pickup for the spent fuel from shutdown reactors, and based upon a 2034 start date for DOE initiating transfer of commercial spent fuel to a federal facility, DEF anticipates that the removal of spent fuel from the site would be completed by the end of year 2037.

For purposes of this analysis, the plant remains in safe-storage until 2067, at which time it will be decommissioned and the site released for alternative use without restriction, i.e., the license is terminated within the required 60-year time period.

Decommissioning costs were divided into the five escalation categories, for which future rate of inflation factors were established. The five categories are:

Labor	Wages, fringes and benefits for craft, salaries and benefits for professional workers, clerical, administrative, service, contract workers, as well as for certain trades
Equipment & Material	Heavy equipment, specialty tooling, packaging, small tools, construction materials, consumables, rental equipment and temporary construction facilities (trailers)
Energy	Electrical power purchases (as a large industrial customer) to support site operations
LLRW Disposal	Costs for the processing of low-level radioactive waste as well as for the controlled disposal of material that cannot be recovered (released for unrestricted use)

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Other Site operating costs (not already accounted for), for example, taxes, fees, and costs for specialized services and project support activities (may include unspecified contributions from labor, equipment and materials, and transportation), and payments for one-time disposal services (e.g., GTCC)

The following table reflects the percentage of each cost component relative to the total costs to decommission CR-3:

Cost Category	Costs (thousands of 2017 $)	Percent of Total Costs
Labor	525,871	58.7
Equipment & Material	101,477	11.3
Energy	5,671	0.6
LLRW Disposal Costs	90,218	10.1
Other	172,656	19.3

Escalation

The following escalation indices were established for each of the five cost categories. The escalation indices for Labor, Equipment and Material, Energy and Other were provided by IHS-Markit Company via their DataInsight-Web online service. The indices used show the last update as 23 March 2018. IHS-Markit does not provide historical or projections for disposal costs of radioactive waste. As such, a TLG-developed LLRW Disposal/Recycling index was used in this escalation analysis. This index is a combination of historical information through 2017 from NRC publications for disposal site rates and projections using the Consumer Price Index information provided by IHS-Markit as discussed previously.

Forecast data for labor, equipment/ materials, energy, and general inflation were available through 2043. In order to extrapolate beyond the available IHS-Markit data, TLG calculated a 25-year moving average inflation factor to extend the IHS-Markit indices through 2074.

Index Selection

The following table identifies the IHS-Markit data sets used for the four cost categories (exclusive of LLRW disposal). Consistent with the NRC's guidance, TLG escalates the labor component of its decommissioning cost estimates using an Employment Cost Index (ECI) and the energy cost component with a Producer Price Index (PPI).

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Use of the Consumer Price Index, Services (CUSASNS) for general services, site operating costs and one-time expenditures is consistent with the intent of the index (the measure of the average change in prices over time of goods and services).

IHS Markit Forecast Database	TLG Cost Category
ECI Total Compensation (ECIPCTNS)	Labor Expenditures Inflation
Producer Price Index, Machinery & Equipment (WPIP11)	Equipment/Material Expenditures Inflation
Producer Price Index, Fuels and Related Products and Power (WPIP05)	Energy Expenditures Inflation
Consumer Price Index, Services (CUSASNS)	Other Items Expenditures Inflation
TLG-Developed LLRW Disposal Price Index [Historical data based upon Barnwell published tariffs; forecast data based upon the Consumer Price Index (CPI) plus 1% additional to reflect above-inflation increases observed at the Barnwell burial site]	LLRW Disposal / Recycling

Labor

The decommissioning process is labor intensive, with labor representing more than half of the total cost. The estimates for CR-3 include the cost of the craft labor performing field activities, the field supervision and support services, project management, administration, security, and costs for specialty contractors. The Employment Cost Index (ECI) is a quarterly measure of changes in labor costs. It is one of the principal economic indicators used by the Federal Reserve Bank. The index shows changes in wages and salaries and benefit costs, as well as changes in total compensation. The ECIPCTNS index, provided by IHS-Markit, is a yearly estimate of change in the cost of labor, defined as compensation per employee hour worked. The self-employed, owners-managers, and unpaid family workers are excluded from coverage. The ECI is designed as a fixed-weight index at the occupational level, thus eliminating the effects of employment shifts among occupations. Both components of compensation, wages/salaries, and benefits, are covered.

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In addition to TLG's judgment, IHS-Markit has confirmed that the selected index is appropriate to use in determining the rate at which the labor costs will escalate over time.

Equipment and Material

Equipment and material costs in the decommissioning estimates include small tools and consumables as well as the heavy construction equipment involved in the dismantling, demolition and movement of materials around the site. The Producer Price Indexes (PPI) measures monthly average changes in selling prices received by domestic producers for their output. Most of the information used in the PPI is obtained by sampling of industries in the mining and manufacturing sectors of the economy. The indexes reflect price trends for a constant set of goods and services representing the total output of an industry.

In addition to TLG's judgment, IHS-Markit has confirmed that the selected index is appropriate to use in determining the rate at which the equipment and material costs will escalate over time.

Energy

Energy costs in the decommissioning estimate include only direct energy purchases, primarily electric power and fuel oil for heating. TLG uses a broad based power escalation index, the Producers Price Index for Fuels and Related Products and Power (WPIP05). While the WPIP05 index has some volatility (since it tracks in part the price of oil), the cost of energy in the decommissioning estimates is a small percentage and therefore has little effect on the overall escalation rate for decommissioning cost.

In addition to TLG's judgment, IHS-Markit has confirmed that the selected index is appropriate to use in determining the rate at which energy costs will escalate over time.

Low Level Radioactive Waste Disposal

The inflation index used for radioactive waste burial costs is the IHS-Markit Consumer Price Index, with an additional 1% per year to account for differences between low-level waste disposal rates reported in NRC NUREG-1307 documents and general inflation rate (CPI) reported by the Bureau of Labor Statistics.

Other

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"Other" costs in the decommissioning estimates include such items as licensing fees, taxes, special services (for example, a fee for the geologic disposal of Greater-than-Class C waste), as well as labor-intensive activities such as radiological surveys that include costs for off-site analytical services. Because the "Other" costs contain this variety of cost components, TLG uses a Consumer Price Index to project future expenditures. The CPI, Services index measures changes in the prices of goods and services. It is therefore more representative of the non-labor cost elements included in the decommissioning estimates. Accordingly, the use of the CPI for "Other" costs reflects more accurately the cost components with the "Other" category than the use of the "Labor" escalation factor as a proxy.

In addition to TLG's judgment, IHS-Markit has confirmed that the selected index is appropriate to use in determining the rate at which the "other" costs will escalate over time.

Results

The composite average annual escalation rates for each of the five escalation categories are provided in the following table.

Escalation Category	Composite Average Annual Rate (%)
Labor	2.75
Equipment/Material	1.20
Energy	2.52
LLRW Disposal	3.09
Other Items	2.80
Overall	2.64

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The composite average annual escalation rates for the three cost categories identified in the decommissioning cost estimate are provided in the following table.

Cost Category	Composite Average Annual Rate (%)
License Termination	2.67
Spent Fuel Management	2.72
Site Restoration	2.37
Overall	2.64

No discounting of the escalated dollars was performed. The following Tables A through D provides escalated schedules of annual expenditures in each of the five cost categories through to the end of the decommissioning period (*i.e.*, 2074) for Total Costs, as well as the three cost categories of License Termination, Spent Fuel Management, and Site Restoration.

20190140.EI Staff Hearing Exhibits 00058

TABLE A
SCHEDULE OF EXPENDITURES: TOTAL COSTS
(thousands, year-of-expenditure dollars)

Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2018	18,359	1,477		1,299	25,583	46,718
2019	15,101	1,280		385	3,815	20,581
2020	8,827	143		9	2,316	11,295
2021	9,075	144		9	2,475	11,703
2022	9,356	145		9	2,456	11,966
2023	9,642	146		10	2,531	12,329
2024	9,962	148		10	2,718	12,838
2025	10,233	149		10	2,689	13,081
2026	10,537	151		10	2,768	13,466
2027	10,842	153		11	2,958	13,964
2028	11,186	155		11	2,936	14,288
2029	11,460	156		11	3,006	14,633
2030	11,754	158		12	3,206	15,130
2031	12,055	160		12	3,168	15,395
2032	12,400	162		13	3,261	15,836
2033	12,687	164		13	3,469	16,333
2034	13,017	166		13	3,428	16,624
2035	13,359	168		14	3,520	17,061
2036	13,751	171		14	3,766	17,702
2037	16,243	4,851		15	3,712	24,821
2038	3,756	153		13	3,104	7,026
2039	3,856	155		13	3,340	7,364
2040	3,971	157		13	3,282	7,423
2041	4,066	159		14	3,361	7,600
2042	4,175	161		14	3,451	7,801
2043	4,286	163		15	3,544	8,008
2044	4,418	166		15	3,654	8,253
2045	4,528	167		15	3,747	8,457
2046	4,654	169		16	3,852	8,691

20190140.EI Staff Hearing Exhibits 00059

TABLE A (continued)
SCHEDULE OF EXPENDITURES: TOTAL COSTS
(thousands, year-of-expenditure dollars)

Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2047	4,782	171		16	3,959	8,928
2048	4,926	174		17	4,079	9,196
2049	5,047	175		17	4,181	9,420
2050	5,184	177		18	4,295	9,674
2051	5,325	179		19	4,413	9,936
2052	5,484	182		19	4,545	10,230
2053	5,616	184		20	4,656	10,476
2054	5,766	186		20	4,782	10,754
2055	5,921	189		21	4,912	11,043
2056	6,096	191		22	5,060	11,369
2057	6,243	193		22	5,183	11,641
2058	6,411	196		23	5,324	11,954
2059	6,584	198		24	5,469	12,275
2060	6,780	201		24	5,634	12,639
2061	6,944	203		25	5,772	12,944
2062	7,132	206		26	5,929	13,293
2063	7,325	208		27	6,091	13,651
2064	7,544	211		28	6,274	14,057
2065	7,727	213		28	6,428	14,396
2066	7,937	216		29	6,604	14,786
2067	87,138	2,151	2,543	104	7,406	99,342
2068	189,584	18,427	4,245	18,813	14,830	245,899
2069	212,004	47,990	4,137	171,231	63,637	498,999
2070	208,596	34,654	3,770	128,684	55,085	430,789
2071	205,493	21,953	3,415	86,758	46,743	364,362
2072	170,418	10,655	1,930	34,883	27,740	245,626
2073	82,664	18,977	541	23	16,593	118,798
2074	47,418	13,872	311		11,030	72,631
Totals	1,605,645	184,229	20,892	442,959	461,770	2,715,495
Percentage by Category						
	59.13%	6.78%	0.77%	16.31%	17.01%	100.00%

20190140.EI Staff Hearing Exhibits 00060

TABLE B
SCHEDULE OF EXPENDITURES: LICENSE TERMINATION COSTS
(thousands, year-of-expenditure dollars)

Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2018	7,827	346		1,299	11,499	20,971
2019	5,368	188		385	2,270	8,211
2020	6,148	143		9	1,761	8,061
2021	6,321	144		9	1,812	8,286
2022	6,517	145		9	1,868	8,539
2023	6,716	146		10	1,925	8,797
2024	6,939	148		10	1,990	9,087
2025	7,128	149		10	2,045	9,332
2026	7,340	151		10	2,105	9,606
2027	7,552	153		11	2,165	9,881
2028	7,791	155		11	2,233	10,190
2029	7,982	156		11	2,286	10,435
2030	8,187	158		12	2,347	10,704
2031	8,397	160		12	2,409	10,978
2032	8,637	162		13	2,480	11,292
2033	8,837	164		13	2,539	11,553
2034	9,067	166		13	2,607	11,853
2035	9,305	168		14	2,677	12,164
2036	9,578	171		14	2,757	12,520
2037	9,805	172		15	2,823	12,815
2038	3,756	153		13	3,104	7,026
2039	3,856	155		13	3,187	7,211
2040	3,971	157		13	3,282	7,423
2041	4,066	159		14	3,361	7,600
2042	4,175	161		14	3,451	7,801
2043	4,286	163		15	3,544	8,008
2044	4,418	166		15	3,654	8,253
2045	4,528	167		15	3,747	8,457
2046	4,654	169		16	3,852	8,691

20190140.EI Staff Hearing Exhibits 00061

TABLE B (continued)
SCHEDULE OF EXPENDITURES: LICENSE TERMINATION COSTS
(thousands, year-of-expenditure dollars)

Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2047	4,782	171		16	3,959	8,928
2048	4,926	174		17	4,079	9,196
2049	5,047	175		17	4,181	9,420
2050	5,184	177		18	4,295	9,674
2051	5,325	179		19	4,413	9,936
2052	5,484	182		19	4,545	10,230
2053	5,616	184		20	4,656	10,476
2054	5,766	186		20	4,782	10,754
2055	5,921	189		21	4,912	11,043
2056	6,096	191		22	5,060	11,369
2057	6,243	193		22	5,183	11,641
2058	6,411	196		23	5,324	11,954
2059	6,584	198		24	5,469	12,275
2060	6,780	201		24	5,634	12,639
2061	6,944	203		25	5,772	12,944
2062	7,132	206		26	5,929	13,293
2063	7,325	208		27	6,091	13,651
2064	7,544	211		28	6,274	14,057
2065	7,727	213		28	6,428	14,396
2066	7,937	216		29	6,604	14,786
2067	85,483	2,151	2,543	104	7,406	97,687
2068	184,169	18,409	4,245	18,813	14,830	240,466
2069	205,800	47,834	4,137	171,231	63,637	492,639
2070	203,738	34,552	3,770	128,684	55,085	425,829
2071	201,953	21,902	3,415	86,758	46,743	360,771
2072	169,004	10,634	1,930	34,883	27,740	244,191
2073	20,842	454	130	23	2,077	23,526
2074	455					455
Totals	1,389,370	144,584	20,170	442,959	406,888	2,403,971
Percentage by Category						
	57.79%	6.01%	0.84%	18.43%	16.93%	100.00%

20190140.EI Staff Hearing Exhibits 00062

TABLE C
SCHEDULE OF EXPENDITURES: SPENT FUEL MANAGEMENT COSTS
(thousands, year-of-expenditure dollars)

Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2018	10,533	1,131			13,807	25,471
2019	9,733	1,092			1,370	12,195
2020	2,679				555	3,234
2021	2,754				663	3,417
2022	2,839				588	3,427
2023	2,926				606	3,532
2024	3,023				729	3,752
2025	3,105				644	3,749
2026	3,198				663	3,861
2027	3,290				793	4,083
2028	3,394				703	4,097
2029	3,478				720	4,198
2030	3,567				859	4,426
2031	3,658				759	4,417
2032	3,763				781	4,544
2033	3,850				930	4,780
2034	3,950				821	4,771
2035	4,054				843	4,897
2036	4,173				1,009	5,182
2037	6,438	4,679			889	12,006
2038						
2039					153	153
Totals	84,405	6,902			28,885	120,192
Percentage by Category						
	70.23%	5.74%			24.03%	100.00%

20190140.EI Staff Hearing Exhibits 00063

TABLE D
SCHEDULE OF EXPENDITURES: SITE RESTORATION COSTS
(thousands, year-of-expenditure dollars)

Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2018					277	277
2019					176	176
2020-66	0	0	0	0	0	0
2067	1,656					1,656
2068	5,414	17				5,431
2069	6,205	156				6,361
2070	4,858	103				4,961
2071	3,540	51				3,591
2072	1,414	20				1,434
2073	61,822	18,523	411		14,515	95,271
2074	46,963	13,872	311		11,030	72,176
Totals	131,872	32,742	722		25,998	191,334
Percentage by Category						
	68.92%	17.11%	0.38%		13.59%	100.00%

20190140.EI Staff Hearing Exhibits 00064

48. PSC Rule 25-6.04365(3)(n), F.A.C., requires that the utility provide the methodology and escalation rate used in converting the current estimated decommissioning costs to future estimated decommissioning costs and supporting documentation and analyses. Please provide this information regarding CR3.

RESPONSE:

An escalation rate of 2.64% was used for all years of escalated DEF owner costs. This rate was obtained from the "Escalation Analysis for the Crystal River Unit 3 Nuclear Generating Plans 2017 Site-Specific Decommissioning Cost Estimate" prepared by TLG Services, Inc. in 2018 (the "TLG Report"). This rate is the overall "Composite Average Annual Rate (%)" calculated by TLG Services, Inc. for total decommissioning costs, which takes into consideration all categories of decommissioning costs. The TLG Report, which includes the assumptions and methodology used, has been included as Bates Nos. DEF RESP STAFF 5TH ROG – 000329 through DEF RESP STAFF 5TH ROG – 000346.

SUPPLEMENTAL RESPONSE:

DEF has prepared an analysis that compares the 2013 TLG Services, Inc. cost study and the 2017 TLG Services, Inc. cost study (i.e. the TLG Report) (together, the "TLG Cost Studies") to the contract value of the Decommissioning Services Agreement ("DSA") between ADP CR3, LLC and ADP SF1, LLC (jointly, "ADP") and DEF. The key attributes of this analysis include:

- **The analysis was conducted using the detailed information in the TLG Cost Studies and Attachment 7 (pay-item schedule) to the DSA**
- **The analysis was performed by escalating the costs under the TLG Cost Studies to 2019 dollars**
- **The project duration is approximately seven (7) years in both the TLG Cost Studies and the DSA**
- **The project timeline is from 2067 to 2074 in the TLG Cost Studies and 2020 to 2027 in the pay-item schedule**
- **The scope of work during these seven (7) years are the same in the TLG Cost Studies and the pay-item schedule**
- **There are no spent fuel management cost included in the analysis**
- **The estimated cost in the TLG Cost Studies and the pay-item schedule include, labor, materials, project management, waste disposal and contingency costs**
- **The analysis compares seven high-level work activities including site activation, decommissioning preparations, large component removal, plant system removal/ building remediation, license termination and site restoration**
- **Periods 3A and 3B in the TLG Cost Studies were combined to allow for a more direct comparison to the pay-item schedule in the DSA**

The results of the analysis demonstrate that the estimated decommissioning costs are consistent even though the total estimated costs were derived by two different methodologies. TLG Services, Inc. uses its proprietary system and site specific information to complete its cost studies. ADP used its proprietary estimating system to complete its

estimate. See attached analysis identified as Bates Nos. DEF SUPP RESP STAFF 5TH ROG – 000347 to DEF SUPP RESP STAFF 5TH ROG – 000348. Please note that portions of this attachment are confidential and subject to DEF's Fourth Request for Confidential Classification.

50. PSC Rule 25-6.04365(3)(q), F.A.C., requires that the utility provide a summary and explanation of material differences between the current study and the utility's last filed study including, at minimum, changes in methodology and assumptions. DEF's Study, included in witness Hobbs testimony, Exhibit No._ (TH-2), page 3 of 12, states that there are "significant changes" to the cost estimate completed in 2018. Please summarize these changes as well as changes in the methodology and assumptions used to obtain that estimate.

RESPONSE:

Please see the following excerpt from page 4 of 12 of Exhibit No._ (TH-2):

> The analysis shows that the total cost to decommission under DECON is $617M, which is $278.9M lower than the cost under the 2018 SAFSTOR estimate of $895.9M. Note however, that this analysis is not a direct comparison as the decommissioning in the 2018 SAFSTOR estimate was assumed to take place from 2018 through 2074 versus the current DECON study, which has decommissioning occurring from 2020 through 2038. Costs to reach SAFSTOR dormancy (previous spend) from the 2018 estimate are excluded from this study. The DECON alternative, based upon the contract structure with ADP, does not include spent fuel management costs. Additionally, the contract with ADP is a different contracting model that significantly reduces utility staff requirements/DEF management costs, as well as transfers responsibility for emergent issues and related costs to ADP. Note that ADP expects to recover their spent fuel management costs from the DOE.
>
> Due to the change in methodology and contracting model selected and significant change in the timing and duration of decommissioning, a comparison of each cost element is not relevant. As such, DEF did not prepare a Comparison Report for the current study versus the 2018 estimate.

SUPPLEMENTAL RESPONSE:

Please see DEF's supplemental response to interrogatory number 48 above.

51. PSC Rule 25-6.04365(3)(r), F.A.C., requires that the utility provides supporting schedules, analyses, and data, including the contingency allowance, used in developing the decommissioning cost estimates and annual accruals proposed by DEF. This rule further requires that inflation and funding analyses be included in the supporting schedules. Please provide this information regarding CR3.

RESPONSE:

The project contingency funds are included in the fixed-price contract value. The schedule and cost information, as well as inflation and funding requirements, are all included in the 2019 Accelerated Nuclear Decommissioning Cost Study. Since the 2019 Accelerated Nuclear Decommissioning Cost Study is based on a fixed price contract signed after a thorough competitive bid process, no additional schedules, analyses, and data is available, other than the documents produced on October 16, 2019 in DEF's response to request numbers 8, 11, 12, and 13 of the Staff's Second Request for Production of Documents (Nos. 8-14).

SUPPLEMENTAL RESPONSE:

Please see DEF's supplemental response to interrogatory number 48 above.

AFFIDAVIT

STATE OF FLORIDA)

COUNTY OF Citrus)

I hereby certify that on this 15 day of January, 2020, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared Terry Hobbs, who is personally known to me, and he/she acknowledged before me that he provided the supplemental answers to interrogatory number(s) 43, 48, 50 and 51 from STAFF'S FIFTH SET OF INTERROGATORIES TO DUKE ENERGY FLORIDA, LLC. (NOS. 41-53) in Docket No(s) 20190140-EI, and that the responses are true and correct based on his/her personal knowledge.

In Witness Whereof, I have hereunto set my hand and seal in the State and County aforesaid as of this 15 day of January, 2020.

Notary Public State of Florida
Linda Fay Dye
My Commission GG 285662
Expires 04/14/2023

Linda Fay Dye
Notary Public
State of Florida, at Large

My Commission Expires:
04/14/2023

REDACTED

Period		2013 TLG SAFSTOR Cost (thousands of dollars) License Termination	Site Restoration	Total	(2) CPI 2019 Escalation	2019 ADP Pay Item Schedule	DIFF
					10.09%	[redacted]	[redacted]
3.a & b.	Site Reactivation & Decommissioning Prep (1)	$ 77,778	$ 667	$ 78,445	$ 86,359		
4.a	Large Component Removal	170,798	2,356	$ 173,154	$ 190,622		
4.b	Plant Systems Removal and Building Remediation	155,222	1,397	$ 156,619	$ 172,419		
4.f	License Termination	25,926	-	$ 25,926	$ 28,541		
5.b	Site Restoration	219	47,424	$ 47,643	$ 52,450		
		$ 429,943	$ 51,844	$ 481,787	$ 530,391		

(2) *CPI per Year (table attached)*

2014	0.80%	$ 485,641
2015	0.70%	$ 489,040
2016	2.10%	$ 499,310
2017	2.10%	$ 509,796
2018	1.90%	$ 519,482
2019	2.10%	$ 530,391

Period		2017 TLG SAFSTOR Cost (thousands of dollars) License Termination	Site Restoration	Total	(2) CPI 2019 Escalation	2019 ADP Pay Item Schedule	DIFF
					4.04%	[redacted]	[redacted]
3.a & b.	Site Reactivation & Decommissioning Prep (1)	$ 75,036	$ 699	$ 75,735	$ 78,795		
4.a	Large Component Removal	203,367	2,552	$ 205,919	$ 214,238		
4.b	Plant Systems Removal and Building Remediation	165,021	1,615	$ 166,636	$ 173,368		
4.f	License Termination	28,278	-	$ 28,278	$ 29,420		
5.b	Site Restoration	229	45,690	$ 45,919	$ 47,774		
		$ 471,931	$ 50,556	$ 522,487	$ 543,595		

(2) *CPI per Year (table attached)*

2018	1.90%	$ 532,414
2019	2.10%	$ 543,595

Notes

(1) For comparison purposes TLG periods 3.a & b. were combined to mirror the ADP Pay Item Schedule.

(2) CPI escalation is provided using an annual and compounded rate basis to demonstrate the results are identical regardless of method.

Consumer Price Index Historical Tables for U.S. City Average

CONSUMER PRICE INDEX FOR ALL URBAN CONSUMERS (CPI-U)
(not seasonally adjusted)

ALL ITEMS (1982-84=100)	U.S. City Average											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Consumer Price Index												
2009	211.143	212.193	212.709	213.240	213.856	215.693	215.351	215.834	215.969	216.177	216.330	215.949
2010	216.687	216.741	217.631	218.009	218.178	217.965	218.011	218.312	218.439	218.711	218.803	219.179
2011	220.223	221.309	223.467	224.906	225.964	225.722	225.922	226.545	226.889	226.421	226.230	225.672
2012	226.665	227.663	229.392	230.085	229.815	229.478	229.104	230.379	231.407	231.317	230.221	229.601
2013	230.280	232.166	232.773	232.531	232.945	233.504	233.596	233.877	234.149	233.546	233.069	233.049
2014	233.916	234.781	236.293	237.072	237.900	238.343	238.250	237.852	238.031	237.433	236.151	234.812
2015	233.707	234.722	236.119	236.599	237.805	238.638	238.654	238.316	237.945	237.838	237.336	236.525
2016	236.916	237.111	238.132	239.261	240.229	241.018	240.628	240.849	241.428	241.729	241.353	241.432
2017	242.839	243.603	243.801	244.524	244.733	244.955	244.786	245.519	246.819	246.663	246.669	246.524
2018	247.867	248.991	249.554	250.546	251.588	251.989	252.006	252.146	252.439	252.885	252.038	251.233
2019	251.712	252.776	254.202	255.548	256.092	256.143	256.571	256.558	256.759	257.346	257.208	
Percent change from 12 months ago												
2009	0.0	0.2	-0.4	-0.7	-1.3	-1.4	-2.1	-1.5	-1.3	-0.2	1.8	2.7
2010	2.6	2.1	2.3	2.2	2.0	1.1	1.2	1.1	1.1	1.2	1.1	1.5
2011	1.6	2.1	2.7	3.2	3.6	3.6	3.6	3.8	3.9	3.5	3.4	3.0
2012	2.9	2.9	2.7	2.3	1.7	1.7	1.4	1.7	2.0	2.2	1.8	1.7
2013	1.6	2.0	1.5	1.1	1.4	1.8	2.0	1.5	1.2	1.0	1.2	1.5
2014	1.6	1.1	1.5	2.0	2.1	2.1	2.0	1.7	1.7	1.7	1.3	0.8
2015	-0.1	0.0	-0.1	-0.2	0.0	0.1	0.2	0.2	0.0	0.2	0.5	0.7
2016	1.4	1.0	0.9	1.1	1.0	1.0	0.8	1.1	1.5	1.6	1.7	2.1
2017	2.5	2.7	2.4	2.2	1.9	1.6	1.7	1.9	2.2	2.0	2.2	2.1
2018	2.1	2.2	2.4	2.5	2.8	2.9	2.9	2.7	2.3	2.5	2.2	1.9
2019	1.6	1.5	1.9	2.0	1.8	1.6	1.8	1.7	1.7	1.8	2.1	

PROOF

0.8%	2014
0.7%	2015
2.1%	2016
2.1%	2017
1.9%	2018
2.1%	2019

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DEF's Responses to Staff's Sixth Set of Interrogatories Nos. 54-56.

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 24
PARTY: STAFF HEARING EXHIBITS
DESCRIPTION: Terry Hobbs

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Duke Energy Florida, LLC to Approve Transaction with Accelerated Decommissioning Partners, LLC for Accelerated Decommissioning Services at the CR3 Facility, Transfer of Title to Spent Fuel, and Assumption of Operations of the CR3 Facility Pursuant to the NRC License, and Request for Waiver From Future Application of Rule 25-6.04365, F.A.C. for Nuclear Decommissioning Study	DOCKET NO.: 20190140-EI Dated: January 13, 2020

DUKE ENERGY FLORIDA, LLC'S RESPONSE TO STAFF'S SIXTH SET OF INTERROGATORIES (NOS. 54-56)

Duke Energy Florida, LLC, ("DEF"), by and through undersigned counsel, hereby responds to *Staff's Sixth Set of Interrogatories to Duke Energy Florida, LLC (Nos. 54-56)* served on December 16, 2019, by the Staff of the Florida Public Service Commission ("FPSC"), as follows:

INTERROGATORIES

54. Please refer to witness Hobbs' Direct Testimony, page 16 where the witness states:

> "The owners cost through 2038 include DEF operating costs to the closing date, pay item validation, taxes, fees, insurance, and other contract management costs. Most of the owners' costs are incurred from January 1, 2019 through deal closure, which is estimated to occur in June 2020."

a. Please discuss what the term "closing date" refers to, and specify when it is expected by DEF.

b. Please discuss what the term "deal closure" refers to.

c. Please explain the difference between the "closing date" and the date of "deal closure."

d. Please discuss what "other contract management costs" are being referred to.

RESPONSE to subpart a:

Per Section 1.1 of the Decommissioning Services Agreement (DSA), the terms "Closing" and "Closing Date" have the meanings set forth for such terms in Section 4.1 of the DSA.

Section 4.1 of the DSA states, "The consummation of the transactions as contemplated by the SNF PSA (the "Closing") shall be held within ten (10) Business Days after the date on which the last of the conditions precedent to Closing set forth in Sections 6.1 and 6.2 of the SNF PSA have been either satisfied or waived by the respective Party for whose benefit such conditions precedent exist (except with respect to those conditions which by their terms are to be satisfied at Closing), but in any event not after the termination of this Agreement pursuant to Article 5. The date on which the Closing occurs under the SNF PSA is referred to herein as the "Closing Date."

Section 6.1 of the SNF PSA contains the following conditions precedent to the obligation of DEF (the "Seller" under the SNF PSA) to consummate the transactions contemplated by the SNF PSA, which must be fulfilled at or prior to the closing date (or waived by the Seller):

"6.1.1 No preliminary or permanent injunction or other order or decree by any Governmental Authority which restrains or prevents the consummation of the transactions contemplated by this Agreement or the Ancillary Agreements shall have been issued and remain in effect and no statute, rule or regulation shall have been enacted by any Governmental Authority which prohibits the consummation of the transactions contemplated by this Agreement or the Ancillary Agreements;

6.1.2 Seller shall have received all of Company's Required Regulatory Approvals, which are each in form and substance reasonably satisfactory to Seller and without conditions or requirements other than those accepted by Seller or contemplated by this Agreement;

6.1.3 Buyer shall have delivered, or caused to be delivered, to Seller at the Closing, Buyer's closing deliveries described in Section 4.3 of the Decommissioning Agreement;

6.1.4 Buyer shall have performed and complied in all material respects with the covenants and agreements contained in Article 3 of the Decommissioning Agreement which are required to be performed and complied with by Buyer on or prior to the Closing Date;

6.1.5 The representations and warranties of Buyer set forth in this Agreement that are qualified by materiality and the representations and warranties of Buyer under Section 5.5 shall have been true and correct as of the Contract Date and shall be true and correct as of the Closing Date as though made at and as of the Closing Date, and all other representations and warranties of Buyer

set forth in this Agreement shall have been true and correct as of the date hereof and shall be true and correct in all material respects as of the Closing Date as though made at and as of the Closing Date;

6.1.6 Seller shall have received a certificate from an authorized officer of Buyer, dated the Closing Date, certifying that the conditions set forth in Sections 6.1.4, 6.1.5 and 6.1.7 have been satisfied;

6.1.7 Since the Contract Date, no Buyer Material Adverse Effect shall have occurred and be continuing;

6.1.8 Contractor's sole member shall have pledged its equity interest in Contractor, pursuant to the Pledge Agreement, as security for Contractor's obligations under the Decommissioning Agreement and the Ancillary Agreements to which Contractor is a party, and it shall have obtained any consents as may be required for the creation of this security interest, and Seller's security interest shall have attached and shall be a perfected, first-priority security interest in the entire equity interest in Contractor;

6.1.9 Each Parent Guaranty shall be in full force and effect, and Seller shall have received a certificate from an authorized officer of each Parent Guarantor, dated the Closing Date, certifying that the representations and warranties of each Parent Guarantor under its respective Parent Guaranty are true and correct as of the Closing Date;

6.1.10 This Agreement, the Decommissioning Agreement and the Ancillary Agreements shall be in full force and effect as of the Closing Date, with no default thereunder, and all transactions contemplated by this Agreement, the Decommissioning Agreement or the Ancillary Agreements to occur at Closing shall have occurred or shall occur contemporaneously with the Closing;

6.1.11 Contractor shall have established the Contractor's Provisional Trust Fund and funded the Provisional IOI Account;

6.1.12 Buyer shall have established the ISFSI Decommissioning Trust and provided financial assurance to such trust in a form and in an amount meeting the requirements of 10 CFR 70.32(e); and

6.1.13 The Crystal River Decommissioning Reserve Subaccount in the NDF shall contain assets in an amount not less than Fifty Million Dollars ($50,000,000)."

Section 6.2 of the SNF PSA, contains the following conditions precedent to the obligation of ADP SF1, LLC (the "Buyer" under the SNF PSA) to consummate the transactions contemplated by the SNF PSA, which must be fulfilled at or prior to the closing date (or waived by the Buyer):

"6.2.1 No preliminary or permanent injunction or other order or decree by any Governmental Authority which restrains or prevents the consummation of

the transactions contemplated by this Agreement or the Ancillary Agreements shall have been issued and remain in effect and no statute, rule or regulation shall have been enacted by any Governmental Authority which prohibits the consummation of the transactions contemplated by this Agreement or the Ancillary Agreements;

6.2.2 Contractor shall have received all of Contractor's Required Regulatory Approvals, which are in form and substance reasonably satisfactory to Buyer, without conditions or requirements other than those accepted by Buyer in this Agreement or the Ancillary Agreements;

6.2.3 Seller shall have delivered, or caused to be delivered, to Buyer at the Closing, Seller's closing deliveries described in Section 4.2 of the Decommissioning Agreement;

6.2.4 Seller shall have performed and complied in all material respects with the covenants and agreements contained in the Decommissioning Agreement which are required to be performed and complied with by Seller on or prior to the Closing;

6.2.5 The representations and warranties of Seller set forth in this Agreement that are qualified by materiality and the representations and warranties of Seller under Section 4.4 shall have been true and correct as of the Contract Date and shall be true and correct as of the Closing Date as though made at and as of the Closing Date, and all other representations and warranties of Seller set forth in this Agreement shall have been true and correct as of the date hereof and shall be true and correct in all material respects as of the Closing Date as though made at and as of the Closing Date;

6.2.6 Buyer shall have received a certificate from an authorized officer of Seller, dated the Closing Date, certifying that the conditions set forth in Sections 6.2.4, 6.2.5 and 6.2.7 have been satisfied;

6.2.7 Since the Contract Date, no Seller Material Adverse Effect shall have occurred and be continuing;

6.2.8 This Agreement and the Ancillary Agreements shall be in full force and effect as of the Closing Date, with no default thereunder, and all transactions contemplated by this Agreement or the Ancillary Agreements to occur at Closing shall have occurred or shall occur contemporaneously with the Closing; and

6.2.9 The IOI Decommissioning Subaccount shall contain assets that are in an amount not less than the Agreed Amount and shall be subject to the terms set forth in the Amended and Restated NDF Agreement, as amended by the Fourth Amendment to Amended and Restated NDF Agreement."

DEF expects the "closing date" to be in the second quarter of 2020.

RESPONSE to subpart b:

Deal closure is the same as the "closing" and "closing date" described in Interrogatory No. 54.a. above.

RESPONSE to subpart c:

There is no difference.

RESPONSE to subpart d:

This is a generic phrase to describe other costs that may be incurred by DEF. An example of this type of cost is the use of a third-party expert to assess the readiness of the parties to meet all the requirements associated with the "closing," the "closing date," and "deal closure."

55. Please refer to the Direct Testimony of witness Hobbs, Exhibit (TH-2), page 3 of 12, where the witness listed three time periods and the related costs DEF expects to incur:

	Cost $ (000s)
DEF Operating Costs up to closing (2020)	44,000
DEF Operating Costs closing though 2022	4,000
DEF Operating Costs 2023-2038	29,000
Total DEF Cost	77,000

a. Please discuss what the term "closing" refers to, and explain the difference, if any, between this term "closing" and the term "deal closure" discussed in Question 1.

b. Please explain the significance of the time period of "closing through 2022" in comparison with the other two time periods cited above.

RESPONSE to subpart a:

There is no difference between "closing" and "deal closure." The term "closing" has the same meaning as set forth in Interrogatory No. 54.a. above.

RESPONSE to subpart b:

There is no significance of the time period "closing through 2022." The table highlights the expected DEF operating costs between "closing" and the year 2022.

56. Please refer to the Direct Testimony of witness Hobbs, Exhibit (TH-2), page 9 of 12, for the following questions:

a. Please identify all the assumptions upon which the estimates of DEF Owner Costs were derived for Exhibit (TH-2).

b. Please provide a detailed breakdown of the component activities and the related costs that comprise the estimated $17,924,000 (2018 dollars) of DEF owner cost associated with the license termination in 2019.

c. Please provide a detailed breakdown of the component activities and the related costs that comprise the estimated $10,321,000 (2018 dollars) of DEF owner cost associated with the spent fuel management in 2019.

d. Please provide a detailed breakdown of the component activities and the related costs that comprise the estimated $11,190,000 (2018 dollars) of DEF owner cost associated with the license termination in 2020.

e. Please provide a detailed breakdown of the component activities and the related costs that comprise the estimated $3,234,000 (2018 dollars) of DEF owner cost associated with the spent fuel management in 2020.

f. Regarding the estimates of DEF owner costs associated with the license termination, please explain the driver of the cost reduction from 2026 to 2027.

g. Please identify all the annual license termination costs DEF has incurred to date.

h. Please identify all the annual spent fuel management costs DEF has incurred to date.

RESPONSE to subpart a:

As referenced in witness Hobbs' Direct Testimony, page 16, the "owners cost through 2038 include DEF operating costs to the closing date, pay item validation, taxes, fees, insurance, and other contract management costs."

The assumptions upon which the DEF owner costs are estimated upon include salaries and benefits based on staffing plans during this period to support the efforts to place the power block in the long-planned SAFSTOR dormancy status, then to manage the dormancy during the approval process up to closing, as well as post-closing support of observations during the contractor's decommissioning performance and pay item validation concluding with achieving Independent Spent Fuel Storage Installation (ISFSI) only status.

Additionally, throughout the time frames identified on page 9 of 12 of Exhibit __ (TH-2), the estimated DEF owner costs were calculated applying the following assumptions:

(i) Property taxes based on historical assessment;

(ii) Insurance premiums estimated based on historically incurred costs; and

(iii) Other owner costs estimated for elements of contingent contractor services, miscellaneous materials, office supplies, employee travel expenses, and some shared service costs related to the Crystal River Energy Complex (CREC) since the CR3 Facility is one of four plants on the CREC site.

RESPONSE to subpart b:

This budget was prepared on a bottom-up approach to fund the expected and necessary expenditures anticipated for the 2019 fiscal year. The estimated DEF owner costs associated with license termination in 2019 comprised the following activities and related costs:

(i) Approximately 58% of this budget was for the cost of salaries and benefits based on the staffing plan, which included a reduction in staff mid-year.

(ii) Approximately 30% of this budget was for work plans, including contracts and contractors to support the efforts to place the power block in the long-planned SAFSTOR status.

(iii) The remaining 12% of this budget was for the costs of materials and office supplies, employee travel costs and expenses, license costs and fees, and other miscellaneous expenses.

RESPONSE to subpart c:

The amount in question is related to two periods: $1,265,000 for the final two months of 2018 and a budget of $9,055,000 for fiscal year 2019. Both amounts are comprised of two main components, (1) nuclear security and (2) the operation and maintenance of the ISFSI.

Nuclear security comprises approximately 76% of the planned expenditures, with 77% of that amount comprised of salaries and benefits. The remaining 23% is other typical costs in support of the Nuclear Security organization including materials, (e.g., uniforms, ammunition, and misc. office supplies), service contracts (e.g., equipment and software maintenance agreements), employee travel/meals/lodging, training, plus transportation and vehicle expenditures.

The remaining 24% is associated with the maintenance of security equipment, preventive maintenance activities, and surveillance by operations, maintenance, and radiation protection personnel.

RESPONSE to subpart d:

The estimated DEF owner costs associated with license termination in 2020 are broken down into two parts, (1) estimated costs for January through June and (2) estimated costs for June through December. This is based on the assumption that the contract closing will occur at the end of June of 2020.

The estimated costs for January-June are comprised of personnel salaries and benefits per the staffing plan, contracts, materials and supplies, plus other miscellaneous expenses. Additionally, the January-June estimated costs include one-time costs associated with the contract closing.

The estimated costs for July-December are assumed based on salaries and benefits of approximately three (3) full time equivalent personnel to perform observations during the contractor's decommissioning performance and pay item validation. In addition, the July-December costs include taxes based on historically assessed county property taxes, insurance premiums estimated based on historically incurred costs, and other owner costs estimated for elements of contingent contractor services, miscellaneous materials, office supplies, employee travel expenses, and some shared service costs related to CREC, as explained in response to Interrogatory 56.a., subpart (iii), above.

RESPONSE to subpart e:

The cost of spent fuel management is only a DEF owner cost up to the contract closing date (estimated June 2020). Following the closing date, ADP SF1, LLC will assume ownership of the spent nuclear fuel, the ISFSI structure, and nuclear security.

Accordingly, the estimated DEF owner cost of $3,234,000 associated with the spent fuel management is only for the period January-June of 2020. Please refer to the response to Interrogatory No. 56.c above, as the components and related costs comprising the $3,234,000 estimated costs are similar to the breakdown of the DEF spent fuel management costs for 2019.

RESPONSE to subpart f:

The planned completion of the site decontamination and dismantlement is at the end of 2026. Once the site is ISFSI only status, the only DEF costs expected are property taxes and insurance premiums. All other costs will cease.

RESPONSE to subpart g:

As of November 30, 2019, DEF has incurred $106,685,232.85 in annual license termination costs.

RESPONSE to subpart h:

As of November 30, 2019, DEF has incurred $187,901,231.44 in annual spent fuel management costs.

AFFIDAVIT

STATE OF FLORIDA)

COUNTY OF Citrus)

I hereby certify that on this 13 day of January, 2020, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared Terry Hobbs, who is personally known to me, and he/she acknowledged before me that he/she provided the answers to interrogatory number(s) 54-56 from STAFF'S SIXTH SET OF INTERROGATORIES TO DUKE ENERGY FLORIDA, LLC. (NOS. 54-56) in Docket No(s) 20190140-EI, and that the responses are true and correct based on his/her personal knowledge.

In Witness Whereof, I have hereunto set my hand and seal in the State and County aforesaid as of this 13 day of January, 2020.

Notary Public State of Florida
Linda Fay Dye
My Commission GG 285682
Expires 04/14/2023

Linda Fay Dye
Notary Public
State of Florida, at Large

My Commission Expires:
04 | 14 | 2023

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DEF Responses to Staff's Seventh Set of Interrogatories Nos. 57-60, and 62.

58 – Confidential DN. 01316-2020

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 25
PARTY: STAFF HEARING EXHIBITS
DESCRIPTION: Terry Hobbs

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Duke Energy Florida, LLC to Approve Transaction with Accelerated Decommissioning Partners, LLC for Accelerated Decommissioning Services at the CR3 Facility, Transfer of Title to Spent Fuel, and Assumption of Operations of the CR3 Facility Pursuant to the NRC License, and Request for Waiver From Future Application of Rule 25-6.04365, F.A.C. for Nuclear Decommissioning Study	DOCKET NO.: 20190140-EI Dated: March 6, 2020

DUKE ENERGY FLORIDA, LLC'S RESPONSE TO STAFF'S SEVENTH SET OF INTERROGATORIES (NOS. 57-63)

Duke Energy Florida, LLC, ("DEF"), by and through undersigned counsel, hereby serves its responses to *Staff's Seventh Set of Interrogatories to Duke Energy Florida, LLC (Nos. 57-63)* served on February 6, 2020, by the Staff of the Florida Public Service Commission ("FPSC"), as follows:

57. Please refer to DEF's response to Staff's 4th Set of Interrogatories, No. 24, subpart a. Also, please refer to Rule 25-6.04365, F.A.C., Nuclear Decommissioning (Rule). Section (1) Purpose states, in part, as follows: "The rule requires each utility to file a Nuclear Decommissioning Study on a regular basis, the purpose of which is to obtain sufficient information to update cost estimates based on new developments, additional information, technological improvements, and forecasts; to reevaluate alternative methodologies; and to revise the annual accrual needed to recover the costs." Also, Subsection (3)(d) of the Rule, requires the filing of a decommissioning study methodology as part of required nuclear decommissioning studies.

A. In its response to Staff Interrogatory No. 24, DEF indicates that a decommissioning study methodology, per Subsection (3)(d) of the Rule, is not applicable to its filing in this case because a fixed-price contract was used in lieu of a study methodology. Please explain why DEF states that, under the Rule, the existence of a fix-price contract is adequate for supplanting the required study methodology in Section (3)(d).

20190140.EI Staff Hearing Exhibits 00083

B. DEF filed its "Updated Site-Specific Decommissioning Cost Estimate for the Crystal River Unit 3 Nuclear Generating Plant" (Commission Document No. 05915-2018) on September 10, 2018. Section 3.2 of that document indicates the cost study method used was the unit factor method, as adjusted for work difficulty factors and scheduling coordination. Is the development of the DEF/ADP fixed price contract value based on "new developments, additional information, technological improvements, and forecasts", per the Rule, to the same or greater extent as the total estimated costs of $895,893 thousand, appearing in DEF's 2018 study at Table 3.1 in Section 3, using the unit factor method? Please explain.

RESPONSE to 57.A:

Cost estimates are a calculation of future decommissioning costs for which no exact value is determinable and which are based upon a set of generally accepted estimating principles. The cost estimate establishes a minimum target value of funds that must be available at a certain future date, thus assuring adequate funding for future decommissioning, as required by federal regulations.

In contrast, the fixed-price contract establishes the exact value of the decommissioning costs. Accordingly, the fixed-price contract is adequate because it provides the exact costs based on the "new developments" and "additional information" provided to DEF in response to DEF's request for information and proposals for the CR3 decommissioning project. A decommissioning study methodology is not applicable here because the exact decommissioning costs are set forth in the fixed-price contract, which precludes the purpose of a decommissioning study methodology.

RESPONSE to 57.B:

Yes, the fixed-price contract is based on "new developments, additional information, technological improvements, and forecasts."

The ADP estimation process is different than the TLG cost study methodology because ADP considers the experiences of NorthStar, ORANO, and Waste Control Specialists into the cost estimation process. ADP's cost estimates are based on such entities' recent performance of projects similar to the CR3 decommissioning project, which provides a more realistic expectation for performance.

58. Please refer to DEF's response to Staff's 5th Set of Interrogatories, No. 51. DEF states in its response that contingency funds are included in the fixed-price contract value.

A. What is the level of the contingency funds included in the fixed-price contract value, and how was it assessed?

B. Refer also to Section 3, Page 4 of "Updated Site-Specific Decommissioning Cost Estimate for the Crystal River Unit 3 Nuclear Generating Plant" (Commission Document No. 05915-2018) filed on September 10, 2018. How does the range of contingency values for the various major activity-related problems (e.g. decontamination, segmentation, etc.) used in DEF's prior decommissioning study, as shown on Page 4, compare to the contingency funds included in the development of DEF's fixed-price contract value identified in Part A above?

C. If specific contingency values are not available to DEF under the contracting model in this proceeding, what assurance does DEF have that the full range of cost contingencies are represented in the fixed-price contract value?

D. Does the inclusion of contingency funds included in the fixed-price contract value address different types of cost risk to ratepayers than the risks addressed by the performance bonds, provisional trust funding, and parent company guarantees specified in the DSA? Please explain the different types of ratepayer cost risks addressed in each instance.

RESPONSE to 58.A:

The fixed-price contract includes performance uncertainties (contingencies) ranging [redacted] depending on the individual activity. These individual activity contingencies are based on the experiences of NorthStar, ORANO, and other ADP subcontractors and their recent performance of such similar activities. Activities with fixed-price agreements in place with contractors pose less risk of cost growth for the project, which in turn have been assigned a smaller contingency budget as compared to activities with forecasted costs or basic estimates.

Greater contract performance certainty is achieved through multiple layers of performance assurances under the contract, including, fixed-pricing; transfer of risk to ADP; ADP parent company guarantees; subcontractor performance bonds; environmental insurance policy; the [redacted]; provisional trust funding; and, as discussed above, a range of contingencies for individual activities performed.

RESPONSE to 58.B:

The TLG cost estimate includes individual activity contingencies ranging from 10% to 75% depending on the degree of difficulty judged to be appropriate. These individual activity contingencies are based on a set of generally accepted estimating principles, which take into consideration that any of several vendors, with varying degrees of experience and performance results, could be assumed to perform the activities.

The fixed-price contract contingencies are based on the experiences of NorthStar, ORANO, and other ADP subcontractors who have recently performed similar activities, thus providing a more realistic expectation for performance and a more precise contingency value.

RESPONSE to 58.C:

Greater certainty of contract performance is achieved through multiple layers of performance assurances under the contract, including, fixed-pricing; transfer of risk to ADP; ADP parent company guarantees; subcontractor performance bonds; environmental insurance policy; the [redacted]; provisional trust funding; and individual activity contingencies.

RESPONSE to 58.D:

There are no different or additional cost risks to the ratepayers. Greater certainty of contract performance is achieved through multiple layers of performance assurances under the contract, including, fixed-pricing; transfer of risk to ADP; ADP parent company guarantees; subcontractor performance bonds; environmental insurance policy; the [redacted]; provisional trust funding; and individual activity contingencies.

59. Refer to DEF's response to Staff's 5th Set of Interrogatories, No. 50.

A. Expand upon what DEF means by "a different contracting model" compared to that which was used in the utility's last filed study.

B. Explain why the proposed change in methodology, contracting model, and timing and duration of decommissioning renders a comparison of each decommissioning cost element (excluding those related to spent fuel management) between the current study and DEF's last study not relevant.

RESPONSE TO 59.A:

Please see the below excerpt from the direct testimony of Terry Hobbs, pages 15 and 16.

"There are several differences between past cost estimates and the Proposed Transaction. First, spent fuel management costs are not included in the fixed price under the DSA. Since ADPSF1 will own the spent fuel assets, they will fund the operation and maintenance of the ISFSI, management of spent nuclear fuel, the removal of all the spent nuclear fuel and high-level waste from the site and the decommissioning of the ISFSI with funding that is separate and apart from this transaction. Ultimately, this funding is expected to be provided by the U.S. Department of Energy ("DOE"). ADP will have the responsibility for obtaining these funds and will bear any risk of DOE recovery. Since ADPCR3 will operate and maintain the ISFSI for ADPSF1, ADPCR3 will also be responsible to comply with NRC regulations associated with spent fuel management. Second, the fixed price under the DSA does not include the actual costs incurred by DEF to reach the dry dormancy conditions. Past cost studies included the transition costs from an operating plant condition to dry dormancy. The ADP bid does reflect the benefit of these projects including the elimination of significant risks such as the movement of fuel into dry storage."

The TLG cost studies assume the utility will act as the general contractor for the project, which adds significant utility worker costs to the total cost of the project. The contracting model provides that ADP will perform the project work using ADP subcontractors, as needed, which minimizes the utility worker cost.

RESPONSE TO 59.B:

DEF used the competitive bid process that resulted in the DEF/ADP fixed-price contract to determine whether the ADP proposal was feasible and whether ADP was technically competent to perform the project. However, DEF did not use the bid process to compare the final negotiated contract with past cost studies.

DEF used the format of past cost studies in formulating analysis factors for the bids received in order to compare the various bids to each other, but not for the purpose of comparing the bids to previous cost studies. The review checklists and other analysis and evaluation information have been previously submitted to Staff. Specifically, please see:

Bidder Proposal Overall Feasibility Evaluation Summary, identified at Bates Nos. DEF RESP STAFF 2ND POD – 000259 to DEF RESP STAFF 2ND POD – 000262;

Bidder Proposal Technical Evaluation Matrix, identified at Bates Nos. DEF RESP STAFF 2ND POD – 000263 to DEF RESP STAFF 2ND POD – 000264; and

Crystal River Unit 3 Accelerated Nuclear Decommissioning Project RFP Compliance Checklist, identified at Bates Nos. DEF RESP STAFF 2ND POD – 000318 to DEF RESP STAFF 2ND POD – 000319.

60. Refer to Witness Hobb's Direct Testimony, Exhibit TH-2, Section 2, Page 1. DEF's License Termination and Site Restoration Costs per the DEF 2019 Accelerated Nuclear Decommissioning Cost Study, including both ADP Cost and DEF Owner Cost, are projected to be $594.2 (in 2018 dollars, based on $540,000 thousand, per contract, + $54.2 M, owner's license termination) under the DECON method. In DEF's 2014 Nuclear Decommissioning Cost Study (Docket No. 20140057-EI, Document No. 01262-14), DEF showed that total License Termination and Site Restoration Expenditures were $778.6 M (in 2013 dollars, based on $718,319 thousand + $60,310 thousand, respectively) under the DECON method. Without accounting for DEF's annual cost escalation rate of 2.63 percent, the difference in the DECON decommissioning estimates for License Termination and Site Restoration Costs is a $184.4 M decrease in costs. Please explain the apparent significant decrease in costs for License Termination and Site Restoration under the DECON alternative since 2014.

RESPONSE:

DEF has not performed a comparison of the ADP contract value to the 2014 TLG prompt DECON cost study referenced in the question above. The decrease in costs for License Termination and Site Restoration is attributable to the fixed-price contract with ADP, under which costs are estimated by ADP by considering the experiences of NorthStar, ORANO, and Waste Control Specialists and their recent performance of projects similar to the CR3 decommissioning project, providing a more realistic expectation for performance.

62. Please provide the historical costs incurred to decommission CR3:

Cost Incurred To Date to Decommission CR3 (2019 dollars)				
Year	License Termination	Spent Fuel Mgmt.	Site Restoration	Total
2013				
2014				
2015				
2016				
2017				
2018				
2019				

RESPONSE:

	SAFSTOR through DORMANCY June 2013 - July 2019			
	License Termination	Spent Fuel Mgmt	Site Restoration	Total Costs
2013	$ 10,629,563.00	$ 1,963,188.00	$ 792,958.00	$ 13,385,709.01
2014	39,777,271.58	33,232,186.67	2,420,349.74	$ 75,429,807.99
2015	6,911,869.49	44,133,749.67	2,551,390.03	$ 53,597,009.19
2016	21,353,678.10	37,009,725.16	1,729,865.00	$ 60,093,268.26
2017	4,878,230.06	50,015,244.33	441,479.15	$ 55,334,953.54
2018	14,297,371.21	20,055,064.49	33,816.64	$ 34,386,252.34
2019	10,985,395.49	5,798,901.99	(31,971.37)	$ 16,752,326.11
Totals	$ 108,833,378.93	$ 192,208,060.30	$ 7,937,887.19	$ 308,979,326.43

AFFIDAVIT

STATE OF FLORIDA)

COUNTY OF Citrus

I hereby certify that on this 20th day of February, ~~2019~~ 2020, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared Terry Hobbs, who is personally known to me, and he/she acknowledged before me that he/she provided the answers to interrogatory number(s) 57-63 from STAFF'S SEVENTH SET OF INTERROGATORIES TO DUKE ENERGY FLORIDA, LLC (NOS. 57-63) in Docket No. 20190140-EI, and that the responses are true and correct based on his/her personal knowledge.

In Witness Whereof, I have hereunto set my hand and seal in the State and County aforesaid as of this 20th day of February, ~~2019~~ 2020.

Notary Public State of Florida
Linda Fay Dye
My Commission GG 285682
Expires 04/14/2023

Linda Fay Dye
Notary Public
State of Florida, at Large

My Commission Expires:
04/14/2023

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DEF's Responses to Staff's Ninth Set of Interrogatories Nos. 67-72.

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 26
PARTY: STAFF HEARING EXHIBITS
DESCRIPTION: Terry Hobbs

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Duke Energy Florida, LLC to Approve Transaction with Accelerated Decommissioning Partners, LLC for Accelerated Decommissioning Services at the CR3 Facility, Transfer of Title to Spent Fuel, and Assumption of Operations of the CR3 Facility Pursuant to the NRC License, and Request for Waiver From Future Application of Rule 25-6.04365, F.A.C. for Nuclear Decommissioning Study	DOCKET NO.: 20190140-EI Dated: May 8, 2020

DUKE ENERGY FLORIDA, LLC'S RESPONSE TO STAFF'S NINTH SET OF INTERROGATORIES (NOS. 67-72)

Duke Energy Florida, LLC, ("DEF"), by and through undersigned counsel, hereby serves its responses to *Staff's Ninth Set of Interrogatories to Duke Energy Florida, LLC (Nos. 67-72)* served on April 23, 2020, by the Staff of the Florida Public Service Commission ("FPSC"), as follows:

20190140.EI Staff Hearing Exhibits 00093

67. Please refer to Duke Energy Florida's (DEF or Company) Responses to Staff's Fourth Set of Interrogatories, No. 37. If due to the passage of time DEF's response would be different if answered today, please update with the most-current data available to the Company by providing a detailed breakdown of the trust fund portfolio by type of securities held, average maturity, credit rating of fixed income investments, and any other relevant category similar to DEF's original response.

RESPONSE:

Below is a schedule of asset classes held in the portfolio as of April 30, 2020.

Please see the attached document bearing bates number DEF RESP STAFF 9TH ROG - 000402.

	4/30/2020
Fixed Income [1]	$ 625,986,804
U.S. Equity [2]	$ 68,191,997
Cash	$ 13,453,900
Other [3]	$ 62,287
Total	$ 707,694,988

Notes:
1 - U.S. Treasury Bonds
2 - Small, mid, and large-cap U.S. Equity managed to the Russell 3000 Index
3 - Includes such items as international equity and preferred shares

68. Please refer to DEF's responses to Staff's Fourth Set of Interrogatories, No. 39. It is indicated in DEF's response that the Company entered into a protective hedge to secure the low-end value of the trust fund at $610 million. Further in the response, Duke indicates the option strategy it employed essentially created a range on the value of the Nuclear Decommissioning Trust Fund (NDT). Is staff correct that the "range" discussed in its response is/was the then-current value of the NDT (high-end) and the $610 million low-end? If not, please specify the range.

RESPONSE:

Yes, Staff is correct. The hedge secured the low-end value of the trust fund at ~$610 million, which included cash to fund on-going operator costs. The high end of the range, however, was approximately 9% above market levels at the time of execution (~$660 million). Both amounts are after tax.

The expiration date of the hedge was May 29, 2020. Due to the approaching expiration date and a favorable market opportunity, the hedge was liquidated on April 22. As of close of business April 22, the portfolio was valued at ~$707 million (~$660 million after-tax). Prior to the close of the transaction, the assets in the portfolio will be invested predominantly (over 90%) in cash and short-term U.S. Treasury securities. This investment strategy materially limits exposure to market volatility.

69. Please specify the most-current NDT balance available to the Company.

RESPONSE:

As of close of business April 30, 2020, the portfolio was valued at ~$708 million (~$661 million after-tax).

70. Please refer to the Petition to approve transaction for accelerated decommissioning services at CR3 facility, transfer of title to spent fuel and associated assets, and assumption of operations of CR3 facility pursuant to the NRC license, and request for waiver from future application of Rule 25-6.04365, F.A.C. for nuclear decommissioning study, by Duke Energy Florida, LLC (Petition), specifically the Direct Testimony of Terry Hobbs, Exhibit (TH-2), page 5 of 12. The 2038 NDT balance shown in the table titled: "Summary of Estimated Accelerated Decommissioning Costs and NDT Balance," is estimated to be $287 million. If due to the passage of time DEF's estimate of the 2038 NDT (ending) balance would be different if answered today, please update with the most-current estimate available to the Company.

RESPONSE:

DEF's estimate of the 2038 NDT (ending) Balance has not materially changed from last year's estimate.

71. Please refer to pages 17-18 of the Petition. Here the Company writes:

> Rule 25-6.04365, F.A.C., requires DEF to file a nuclear decommissioning study with the Commission every five (5) years. DEF notes that the rule was intended to require such studies "to ensure there are sufficient funds on hand at the time of decommissioning to meet all required expenses by establishing appropriate decommissioning accruals." Accordingly, once DEF has commenced decommissioning (as it proposes to do in this transaction), such studies are no longer necessary.

Does DEF consider the phrase "time of decommissioning" to mean or imply a single point in time, or does it mean/imply an ongoing effort covering a period of time?

RESPONSE:

For purposes of the transaction between DEF and ADPCR3, DEF considers the phrase "time of decommissioning" to mean a single point in time. This is because the transaction between DEF and ADPCR3 contractually fixes the price for the accelerated decommissioning of the CR3 Facility at an amount that is less than the balance of funds already available in in the NDT. Due to the fact that there are adequate decommissioning funds in place at the time of decommissioning. DEF does not believe that filing full additional cost studies beyond the cost study filed on July 10, 2019, would be helpful to the Commission.

72. Please refer to both the Petition, page 19, and the Direct Testimony of DEF Witness David L. Doss Jr., page 3, lines 3-4. On page 19 of the Petition, DEF writes: "[n]o adverse impacts on DEF customers will result from the waiver sought by DEF. The waiver in conjunction with the terms of the proposed transaction will not only ensure that DEF maintains adequate funds in the NDT to cover the projected cost of decommissioning the CR3 Facility. . .." While stated on page 3 of DEF Witness Doss Jr.'s testimony is: "[t]he cost for the Proposed Transaction (including the ADPCR3 costs and DEF's owner's costs) will be paid from the NDT, with any excess funds returned to, or any deficits collected from, DEF's customers and Duke shareholders."

a. How would DEF's customers be apprised of any potential future cost responsibility in excess of what has been contemplated by the Decommission Services Agreement (DSA) or the NDT in the event DEF's request to waive the cost study required by Rule 25-6.04365, Florida Administrative Code, (F.A.C.), is approved?

RESPONSE to 72a.:

In the unlikely event that the current NDT balance is insufficient to cover the expected cost of decommissioning and DEF's contractual remedies against ADP have been exhausted such that additional funds are needed from customers, DEF would file a petition with the FPSC requesting that the Commission authorize an accrual to be collected from customers for the retail portion. At the time it files such petition, DEF will provide notice of the filing to its customers and make a copy of the petition available to them. DEF will thereafter provide yearly written updates of customer cost responsibilities to DEF customers and to the Commission.

b. What is DEF's rationale for requiring customers to remain liable for cost overruns without submitting periodic (remaining) scope and cost re-estimates so customers are put on notice of potential cost overruns (i.e. costs in excess of those outlined in the DSA) and/or expanded scope requirements?

RESPONSE to 72b.:

Please see DEF's response to Interrogatory 72.a above.

c. Please list the circumstances that may require DEF to seek/need additional funding from its customers to fully complete the decommissioning (i.e. license termination) of Crystal River Unit No. 3 (CR3).

RESPONSE to 72c.:

Please see DEF's response to Interrogatory 29 of Staff's Fourth Set of Interrogatories.

d. If DEF's request to waive the cost study required by Rule 25-6.04365, F.A.C., is approved, how would the Company keep the Florida Public Service Commission apprised of decommissioning progress and related matters concerning CR3?

RESPONSE to 72d.:

Please see DEF's response to Interrogatory 72.a above.

AFFIDAVIT

STATE OF FLORIDA)

COUNTY OF _____)

I hereby certify that on this _____ day of _____, 2020, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared _____, who is personally known to me, and he/she acknowledged before me that he provided the answers to interrogatory number(s) _____ from STAFF'S NINTH SET OF INTERROGATORIES TO DUKE ENERGY FLORIDA, LLC. (NOS. 67-72) in Docket No(s) 20190140-EI, and that the responses are true and correct based on his/her personal knowledge.

In Witness Whereof, I have hereunto set my hand and seal in the State and County aforesaid as of this _____ day of _____, 2020.

_____
Notary Public
State of Florida, at Large

My Commission Expires:
_____

27

DEF's Responses to Staff's Tenth Set of Interrogatories Nos. 77 and 81.

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 27
PARTY: STAFF HEARING EXHIBITS
DESCRIPTION: Terry Hobbs

77. Please refer to DEF's Updated Site-Specific Decommissioning Cost Estimate for the Crystal River Unit 3 Nuclear Generating Plant, filed on September 10, 2018. Please provide any updates that DEF has pertaining to that study.

RESPONSE:

There are no updates to the DEF site-specific decommissioning cost estimate filed in September 2018.

81. Please provide an update, if any, to the $77M owner's costs.

RESPONSE:

There is no update available.

AFFIDAVIT

STATE OF FLORIDA)

COUNTY OF _____)

I hereby certify that on this _____ day of _____, 2020, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared TERRY HOBBS, who is personally known to me, and he/she acknowledged before me that he provided the answers to interrogatory number(s): 73-81 from STAFF'S TENTH SET OF INTERROGATORIES TO DUKE ENERGY FLORIDA, LLC. (NOS. 73-81) in Docket No(s) 20190140-EI, and that the responses are true and correct based on his/her personal knowledge.

In Witness Whereof, I have hereunto set my hand and seal in the State and County aforesaid as of this _____ day of _____, 2020.

_____
Notary Public
State of Florida, at Large

My Commission Expires:
_____

28

DEF's Responses to Staff's Eleventh Set Of Interrogatories Nos. 82, 83, and 84.

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 28
PARTY: STAFF HEARING EXHIBITS
DESCRIPTION: Terry Hobbs

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Duke Energy Florida, LLC to Approve Transaction with Accelerated Decommissioning Partners, LLC for Accelerated Decommissioning Services at the CR3 Facility, Transfer of Title to Spent Fuel, and Assumption of Operations of the CR3 Facility Pursuant to the NRC License, and Request for Waiver From Future Application of Rule 25-6.04365, F.A.C. for Nuclear Decommissioning Study	DOCKET NO.: 20190140-EI Dated: May 21, 2020

DUKE ENERGY FLORIDA, LLC'S RESPONSE TO STAFF'S ELEVENTH SET OF INTERROGATORIES (NOS. 82-85)

Duke Energy Florida, LLC, ("DEF"), by and through undersigned counsel, hereby serves its responses to *Staff's Eleventh Set of Interrogatories to Duke Energy Florida, LLC (Nos. 82-85)* served on May 6, 2020, by the Staff of the Florida Public Service Commission ("FPSC"), as follows:

82. On Page 1 of its Petition, DEF requests that the Commission approve a transaction between DEF and Accelerated Decommissioning Partners, LLC. Please provide the following information about the proposed transaction:

A. Complete definition of the transaction.

RESPONSE:

The Decommissioning Services Agreement does not contain a formal definition. The petition defines the transaction between DEF and ADP as the transaction for accelerated decommissioning services at the CR3 facility, transfer of title to spent fuel and associated assets, and the assumption of operations of the CR3 facility pursuant to the NRC license.

The key features of the transaction include (a) the transfer of CR3's Nuclear Regulatory Commission (NRC) license, authorizing possession and maintenance, including decommissioning, of the NRC licensed site, from DEF to ADP CR3, LLC ("Contractor"); (b) the performance by Contractor of all activities necessary to decommission the CR3 facility and the NRC licensed site, including demolishing and dismantling the existing structures and facilities and disposing of waste, in accordance with project specifications and all applicable laws, permits and practices, with a defined portion of the work to be

completed by January 29, 2027, and partial termination of the NRC license, all for a fixed price; (c) the sale and assignment from Company to ADP SF1, LLC, ("Buyer") of the spent nuclear fuel, storage canisters, high level waste, and existing dry spent nuclear fuel storage installation (the "ISFSI") and certain related assets, together with certain associated liabilities and obligations, as well as the assignment from Company to Seller of the Department of Energy Standard Contract for CR3; (d) the operation and maintenance of the ISFSI performed by Contractor and Buyer until all of the spent nuclear fuel is removed from the CR3 facility, and, thereafter, the decommissioning of the ISFSI and full termination of the NRC license, all of which is subject to, and governed by, the terms and conditions of the Decommissioning Services Agreement, including all Exhibits and Attachments thereto.

B. Identification of each and every agreement, license transfer, approval, letter issuance, or other action required as part of the transaction.

RESPONSE:

- **The Decommissioning Services Agreement;**
- **The Spent Nuclear Fuel Purchase and Sale Agreement (Exhibit A of the DSA);**
- **Spent Nuclear Fuel Agreement (Exhibit C of the DSA);**
- **Amended and Restated LLC Agreement (Exhibit D of the DSA);**
- **Pledge Agreement (Exhibit E of the DSA);**
- **Amended and Restated NDF Agreement (Exhibit F of the DSA);**
- **Contractor's Provisional Trust Agreement (Exhibit G of the DSA);**
- **Parent Support Agreements (Exhibits H-1 and H-2 of the DSA);**
- **Assignment and Assumption Agreement (Exhibit J of the DSA);**
- **ISFSI Decommissioning Trust Agreement (Exhibit M of the DSA);**
- **Transfer of the NRC facility operating license to ADPCR3;**
- **Approvals are described in the response to Interrogatory 82.C, below;**
- **Letter of credit (Article 10.1 in the DSA); and**
- **Numerous other actions required by the parties in the transaction, as set forth in the above agreements.**

C. Closing date, approval date, and/or completion date (actual or expected, please specify) for each agreement, license transfer, approval, letter issuance, or other required action contemplated by the transaction.

RESPONSE:

The current estimated transaction closing date is August 1, 2020, but that date is subject to change pending the date on which the FPSC issues a final order and the appeal period has run. The private letter ruling request was submitted to the Internal Revenue Service (IRS) on July 18, 2019. IRS issued the private letter ruling on January 15, 2020. The license transfer application was submitted to the Nuclear Regulatory Commission (NRC) on June

17, 2019. The NRC order approving the license transfer was issued on April 1, 2020. DEF will notify the NRC approximately one week before the closing date so the approved facility operating license can be issued and in effect on August 1, 2020. The FPSC approval of the transaction is pending.

D. For any portions of the transaction not yet finalized, identify current status and any remaining issues or obstacles to completion of that portion of the transaction and what actions DEF and other parties are taking to address such issues or obstacles.

RESPONSE:

See response to Interrogatory 82.C, above.

83. Please refer to witness Doss' direct testimony, Page 3 Line 17 through Page 4, Line 7 in which witness Doss' contemplates the return of NDT "Excess Funds" to DEF customers and shareholders under certain conditions, including full termination of the NRC license.

A. What is the share of the return of Excess Funds (percentage) that would be due to DEF shareholders on the basis of the shareholders buying out the minority interests of previous CR3 co-owners?

RESPONSE:

The past joint owners included the City of Tallahassee (1.3333%), the Florida Municipal Power Agency (6.52%) and the Seminole Electric Cooperative (1.6994%). The combined joint owners share was 9.5527%. The current estimate of excess funds is $287M. Please see DEF's response to Interrogatory 70 of Staff's Ninth Set of Interrogatories. Duke Energy shareholders would be entitled to 9.5527% of the excess funds.

B. What entity(ies) makes the determination to return any Excess Funds to DEF customers and ratepayers?

RESPONSE:

The NRC and the FPSC make the determination. The NRC must approve the license termination and the FPSC must approve how the refund is made to customers.

C. What approvals, if any, must be sought prior to the return of any Excess Funds?

RESPONSE:

If funds are returned after full termination of the NRC license, DEF is not aware of any approvals that must be sought prior to the return of any Excess Funds.

D. Is it contemplated that the segregated subaccount of the NDT could be a source of refunds to customers and shareholders under certain conditions? Please fully explain.

RESPONSE:

Yes. The funds in the Crystal River Decommissioning Reserve Subaccount (Article 1.1 of the DSA) could be the source of refunds to the customers and shareholders if there are funds remaining in the Crystal River Decommissioning Reserve Subaccount.

E. What is DEF's estimated amount of return of funds to DEF's ratepayers and shareholders at this time, and how did DEF determine this amount?

RESPONSE:

The current estimate is $287M. See DEF's response in Interrogatory 70 of Staff's Ninth Set of Interrogatories. DEF estimated the amount in the Crystal River Decommissioning Reserve Account (Article 1.1 of the DSA) at closing minus the DEF costs plus the estimated DOE recovery plus earnings to estimate the 2038 balance of $287M. There are many previous discovery responses on this topic.

F. What, if anything, prohibits Excess Funds from being returned to customers and shareholders prior to full termination of the NRC license? Please explain.

RESPONSE:

The bulk of the CR3 decommissioning funds are held in a qualified nuclear decommissioning trust fund (a "qualified fund"), which is governed by statute and regulations that are administered by the IRS. A qualified fund can only be used to (1) pay or reimburse the taxpayer for decommissioning expenses, (2) pay for expenses associated with the administration of the qualified fund, or (3) make investments. All other payments are strictly prohibited and may result in disqualification of a qualified fund.

A qualified fund must be terminated before excess funds may be returned to customers and shareholders. A qualified fund is terminated when decommissioning of a nuclear power plant is substantially completed.

Under the current regulations, decommissioning of a nuclear power plant is substantially completed when the NRC requirements with respect to the maximum acceptable radioactivity levels are satisfied. In the case of CR3, decommissioning would be substantially completed on the date on which all of the ISFSI-Only Interim End-State Conditions (as defined in the Decommissioning Services Agreement) are achieved. Upon achievement of ISFSI-Only Interim End-State Conditions, the CR3 NRC license will only be partially terminated.

Under proposed regulations, which are expected to be issued this year, decommissioning of a nuclear power plant is substantially completed when all federal, state, local, and contractual decommissioning requirements are fully satisfied. The proposed change accommodates situations where the decommissioning or restoration requirements under state or local law require more time to complete than the NRC requirements. In the case of CR3, decommissioning would be substantially completed on the date on which all of the End-State Conditions (as defined in the Decommissioning Services Agreement) are achieved or a later date if federal, state, or local restoration requirements are imposed on the real property on which the ISFSI is located. Upon achievement of End-State Conditions, the CR3 NRC license will be fully terminated.

All of the CR3 decommissioning funds, including those in a qualified fund, have been reported to the NRC as being available for "decommissioning", as that term is defined in the NRC regulations ("decommissioning funds"). Under the NRC regulations, decommissioning funds can only be used to pay expenses for legitimate decommissioning

activities or ordinary administrative costs (including taxes) and other incidental expenses of a fund (including legal, accounting, actuarial, and trustee expenses). Use of decommissioning funds for any other purpose must be approved by the NRC through the exemption process. To date, the only exemption requests that have been submitted to, and approved by, the NRC relate to the use of decommissioning funds for spent fuel management and site restoration. DEF requested and received such an exemption.

Although the NRC regulations do not expressly state when the NRC's jurisdiction over decommissioning funds terminates, DEF believes the NRC's jurisdiction over CR3's decommissioning funds would terminate on the date on which all of the ISFSI-Only Interim End-State Conditions are achieved because, at that point in time, there would no longer be any outstanding decommissioning obligations with respect to the plant, property, and equipment owned by DEF.

If the current IRS regulations are in effect upon achievement of ISFSI-Only Interim End-State Conditions, then excess funds could likely be returned to customers and shareholders after achievement of ISFSI-Only Interim End-State Conditions. However, DEF does not believe that such a return at that point in time would be in the best interest of customers because, after such a return, federal, state, or local site restoration requirements could be imposed on the real property on which the ISFSI is located, and DEF would need to have access to funds in order to comply with such requirements.

If the proposed IRS regulations are issued prior to achievement of ISFSI-Only Interim End-State Conditions, then excess funds would be returned to customers and shareholders after achievement of End-State Conditions or a later date if federal, state, or local restoration requirements are imposed on the real property on which the ISFSI is located.

84. What is the anticipated impact of the COVID-19 pandemic upon the costs, risks, and viability of CR3 decommissioning assuming the transaction is approved, and what considerations are included in DEF's assessment?

RESPONSE:

DEF does not anticipate any impact to the costs, risks, and viability of the transaction. DEF and contractors continue to work at the CR3 facility to secure and monitor the spent nuclear fuel stored in the Independent Spent Fuel Storage Installation (ISFSI), monitor and maintain other areas of the site, and continue to work towards closing the transaction with ADPCR3.

DEF continues to maintain the CR3 facility in a safe, healthy manner. Some of the actions implemented in response to the pandemic include:

- **Allowing some workers to work remotely and minimize time physically at the plant.**
- **Workers that must be at the site are practicing social distancing and good hygiene practices.**
- **Each day, workers that go the site must self-check for the virus symptoms, and any other symptoms of illness, and must stay home if they are ill and seek any necessary medical assistance.**
- **Cleaning crews clean and disinfect the site common areas and the ingress/egress paths twice daily.**
- **Workers are required to wear face coverings if they cannot maintain the required social distancing.**
- **DEF has contingencies in place in the event that a worker exhibits the virus symptoms at work, including sending the ill worker home to seek medical assistance, additional PPE for workers in the area, and cleaning of the impacted areas.**
- **DEF has a tracking system and protocols for workers that may have been in close contact with an ill worker.**

North Star and their subcontractors, including Orano, have continued the decommissioning work at the Vermont Yankee project with very similar precautions described above.

AFFIDAVIT

STATE OF FLORIDA)

COUNTY OF _____)

I hereby certify that on this _____ day of _____, 2020, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared TERRY HOBBS, who is personally known to me, and he/she acknowledged before me that he provided the answers to interrogatory number(s): _____ from STAFF'S ELEVENTH SET OF INTERROGATORIES TO DUKE ENERGY FLORIDA, LLC. (NOS. 82-85) in Docket No(s) 20190140-EI, and that the responses are true and correct based on his/her personal knowledge.

In Witness Whereof, I have hereunto set my hand and seal in the State and County aforesaid as of this _____ day of _____, 2020.

_____
Notary Public
State of Florida, at Large

My Commission Expires:
_____

29

DEF's Response to Staff's First Set of Production of Documents No. 2.

Including 1st & 2nd Supplemental Responses.

Additional files contained on Staff Hearing Exhibits CD for No. 2

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 29
PARTY: STAFF HEARING EXHIBITS
DESCRIPTION: Terry Hobbs

2. Please provide copies of all public documents filed by DEF with the NRC to implement its transaction with ADP CR3 LLC (ADPCR3) concerning the decommissioning of NRC License No. DPR -72.

RESPONSE: Documents responsive to this request are attached hereto as Bates Nos. DEF RESP STAFF 1ST - 000001 through DEF RESP STAFF 1ST POD - 000240.

3. Please provide copies of all public documents filed by ADPCR3 with the NRC to implement the transaction with DEF concerning the decommissioning of NRC License No. DPR -72.

RESPONSE: DEF has no documents in its possession or control that are responsive to this request. As the NRC Licensee and owner of the docket file for CR3, DEF is responsible for making all NRC filings associated with the transaction.

4. Please provide copies of all public documents filed by DEF with the NRC to implement its transaction with ADP SF1 LLC (ADPSF1) concerning the decommissioning of NRC License No. DPR -72.

RESPONSE: Please see the documents produced in response to paragraph 2 above.

5. Please provide copies of all public documents filed by ADPSF1 with the NRC to implement the transaction with DEF concerning the decommissioning of NRC License No. DPR -72.

RESPONSE: DEF has no documents in its possession or control that are responsive to this request. As the NRC Licensee and owner of the docket file for CR3, DEF is responsible for making all NRC filings associated with the transaction.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Duke Energy Florida, LLC to Approve Transaction with Accelerated Decommissioning Partners, LLC for Accelerated Decommissioning Services at the CR3 Facility, Transfer of Title to Spent Fuel, and Assumption of Operations of the CR3 Facility Pursuant to the NRC License, and Request for Waiver From Future Application of Rule 25-6.04365, F.A.C. for Nuclear Decommissioning Study	DOCKET NO.: 20190140-EI Dated: February 5, 2020

DUKE ENERGY FLORIDA, LLC'S SUPPLEMENTAL RESPONSE TO STAFF'S FIRST REQUEST FOR PRODUCTION OF DOCUMENTS (NOS. 1-7)

Duke Energy Florida, LLC, ("DEF"), by and through undersigned counsel, hereby serves its supplemental response to request number 2 of *Staff's First Request for Production of Documents to Duke Energy Florida, LLC (Nos. 1-7)* served on August 14, 2019, as follows:

DOCUMENTS REQUESTED

2. Please provide copies of all public documents filed by DEF with the NRC to implement its transaction with ADP CR3 LLC (ADPCR3) concerning the decommissioning of NRC License No. DPR -72.

RESPONSE:

Documents responsive to this request are attached hereto as Bates Nos. DEF RESP STAFF 1ST POD - 000001 through DEF RESP STAFF 1ST POD - 000240.

SUPPLEMENTAL RESPONSE:

Supplemental documents responsive to this request are attached hereto as Bates Nos. DEF SUPP RESP STAFF 1ST POD - 000349 through DEF SUPP RESP STAFF 1ST POD - 000358.

Accelerated Decommissioning Partners, LLC
17101 Preston Road, Suite 115 | Dallas, TX 75248

Scott E. State, P.E., Chief Executive Officer
sstate@NorthStar.com | o.682.503.2240 | c.303.898.8035

10 CFR 50.80
10 CFR 50.90
10 CFR 72.50

December 26, 2019
3F1219-01

United States Nuclear Regulatory Commission
Washington, D.C. 20555-001
ATTN: John B. Hickman, Project Manager
Reactor Decommissioning Branch
Division of Decommissioning, Uranium Recovery, and Waste Programs
Office of Nuclear Material Safety and Safeguards

Subject: Supplemental Information in Support of Crystal River Unit 3 (CR3)– Revised Post Shutdown Decommissioning Activities Report and Decommissioning Cost Estimate

References:
(1) Letter, Duke Energy Florida, LLC to USNRC, "Crystal River Unit 3 – Site Specific Decommissioning Cost Estimate", dated June 27, 2018 (ADAMS Accession No.ML18178A181)

(2) Letter, Duke Energy Florida, LLC to USNRC, "Application for Order Consenting to Direct Transfer of Control of Licenses and Approving Conforming License Amendment", dated June 14, 2019 (ADAMS Accession No. ML19170A194)

(3) Letter, ADP CR3, LLC (ADP), "Notification of Revised Post-Shutdown Decommissioning Activities Report", dated June 26, 2019 (ADAMS Accession No. ML19177A080)

Dear Mr. Hickman:

ADP CR3, LLC (ADP) submits the following Supplemental Information in support of the review of the Revised Post Shutdown Decommissioning Activities Report identified in Reference (3). This Supplemental Information provides additional detail regarding the decommissioning cost estimate associated with radioactive waste provided in both Reference (2) and Reference (3).

ADP estimated the radioactive waste volumes for the Crystal River Unit 3 Plant based on data from the TLG 2018 Decommissioning Cost Estimate (DCE) provided in Reference (1). Through its review of plant conditions, material takeoff calculations and available documentation, including groundwater monitoring data, the historical site assessment and drawings, ADP increased the total volume of radioactive waste by nearly 80%. This substantial increase in waste volume will accommodate ADP's planned deconstruction methodology that focuses on lowering dose to workers by removing material for disposal after reduced surface decontamination time than originally assumed in Reference (1). This method will generate added low activity waste volume that will be disposed of in the Waste Control Specialists LLC's (WCS) exempt waste cell at the WCS facility.

There is also a reduction in Class A waste compared to the TLG estimate that is accomplished by low activity Class A material being disposed of in the WCS exempt cell. ADP utilized the WCS Waste Acceptance Criteria (WAC) for Exempt Low Activity Waste (LAW) and Class A waste for determining the classification of CR3 radiological waste. TLG has not historically considered the WCS exempt cell for disposal as it is a relatively new cell (initial waste acceptance in 2015). This reclassification has resulted in a lower overall cost for radioactive waste disposal compared to TLG's estimate.

It should be noted that the above ADP approach is entirely consistent with the approach applied at Vermont Yankee by NorthStar. To date NorthStar has shipped over 3,000 tons of waste to WCS with the percentage meeting the exempt WAC exceeding our calculated volumes of exempt classification since some waste expected to be Class A was classified as exempt, while all waste expected to be exempt has been accepted as such.

The table below provides a detailed comparison of the ADP vs TLG estimated waste volumes. All disposal costing in our estimate is directly derived from these volumes and contracted rates committed to by WCS for the duration of the CR3 decommissioning project.

Waste Class	UOM	TLG 2018 DCE	ADP
Process/Exempt	CF	279,214	810,869
Class A	CF	187,369	29,674
Class B	CF	1,252	800
Class C	CF	642	800
GTCC	CF	1,654	1,650
Total Waste Volume		**470,131**	**843,793**

ADP notes that although volumes are "estimated," the unit costs used for each category of waste in the total cost estimate are fixed, because the unit cost rates have been contracted and committed.

ADP appreciates the opportunity to provide this information, and we look forward to further discussions.

Sincerely,

Scott E. State, P.E.
Chief Executive Officer

Docket 50-302
Docket 72-1035
Operating License DPR-72

Crystal River Nuclear Plant
15760 W. Power Line Street
Crystal River, FL 34428
Docket 50-302
Docket 72-1035
Operating License No. DPR-72

10 CFR 50.80
10 CFR 50.90
10 CFR 72.50

January 17, 2020
3F0120-01

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Supplemental Information in Support of Crystal River Unit 3 (CR3) License Transfer Application – FOCD Negation Action Plan

References: Letter, Duke Energy Florida, LLC to USNRC, "Application for Order Consenting to Direct Transfer of Control of Licenses and Approving Conforming License Amendment", dated June 14, 2019 (ADAMS Accession No. ML19170A194)

Dear Mr. Hickman:

On behalf of itself and ADP CR3, LLC (ADP CR3), Duke Energy Florida, LLC submits the following Supplemental Information in support of the review of the above referenced license transfer application (LTA) for the transfer of Facility Operating License No. DPR-72 for the Crystal River Unit 3 Nuclear Generating Plant (CR-3) (the Facility License) and the associated general license for the CR-3 Independent Spent Fuel Storage Installation (ISFSI) (the Licenses) to possess, maintain, and decommission CR-3 and the ISFSI (collectively, the CR-3 Facility). The LTA requests approval to transfer the authority under the Licenses to possess, maintain and decommission the CR3 Facility from Duke Energy Florida, LLC to ADP CR3.

The LTA explains that ADP CR3 is a wholly owned subsidiary of Accelerated Decommissioning Partners, LLC (ADP), which is 75% owned and controlled by NorthStar Group Services, Inc. (NorthStar). NorthStar is a Delaware corporation that is owned and controlled by U.S. citizens. The other non-controlling 25% interest in ADP is owned by Orano Decommissioning Holdings, which is owned by Orano USA LLC, which is owned by Orano SA, a French Société Anonyme, which is majority owned by the French State.

Given that the CR3 Facility is no longer a production or utilization facility, and based upon the fact that ADP is under U.S. control, the LTA stated that foreign, ownership, control or domination (FOCD) negation action measures are not necessary. ADP continues to

believe that no NRC imposed FOCD negation measures are required. However, NorthStar and Orano anticipated that FOCD negation could be raised as an issue for ADP, because its business is to acquire Part 50 licenses, and the FOCD restrictions in 10 CFR 50.38 apply to such licenses. Thus, when ADP was formed, NorthStar and Orano included FOCD negation measures in Section 11.4 of the Limited Liability Agreement of Accelerated Decommissioning Partners, LLC dated February 7, 2017 (the ADP LLC Agreement).

The terms of Section 11.4 assure that NorthStar has exclusive authority to decide matters relating to nuclear safety or security, and the ability to appoint any Chief Executive Officer or Chief Nuclear Officer. These measures assure U.S. control of ADP for purposes of FOCD compliance, and fully negate any potential for FOCD over the Licenses. In addition, ADP CR3 has now developed a Negation Action Plan addressing FOCD (attached). This plan augments and implements the governance provisions of the ADP LLC Agreement. ADP CR3 will implement this plan upon acceptance by the NRC staff.

This correspondence contains no new regulatory commitments of DEF.

I declare under penalty of perjury that the foregoing regarding DEF is true and correct. Executed on January 14, 2020.

Sincerely,

Ronald Reising, Senior Vice President
Operations Support

Enclosure: ADP CR-3, LLC Negation Action Plan

NMSS Project Manager
Regional Administrator, Region I
State of Florida

STATE OF Connecticut)
) SS. Trumbull
COUNTY OF Fairfield)

Scott E. State, being duly sworn according to law deposes and says:

I am Chief Executive Officer, NorthStar Group Services, Inc. and Accelerated Decommissioning Partners, LLC (ADP), and as such, I am familiar with the contents of this correspondence and the attachments thereto concerning the Crystal River Unit 3, Nuclear Generating Plant and the matters set forth therein regarding ADP and its affiliated companies are true and correct to the best of my knowledge, information and belief.

Scott E. State

Subscribed and Sworn to before me

this 14th day of January, 2020

Notary Public of

JEAN S. NAGY
NOTARY PUBLIC
MY COMMISSION EXPIRES 10/31/2023

ADP CR-3, LLC NEGATION ACTION PLAN

I. INTRODUCTION

a. The following Negation Action Plan (the Plan) provides requirements and guidance to ensure negation of potential foreign ownership, control or domination (FOCD) over the Facility Operating License No. DPR-72 for the Crystal River Unit 3 Nuclear Generating Plant (CR-3) (the Facility License) and the associated general license for the CR-3 Independent Spent Fuel Storage Installation (ISFSI) (the Licenses) to possess, maintain, and decommission CR-3 and the ISFSI (collectively, the CR-3 Facility). The Licenses have been issued by the U.S. Nuclear Regulatory Commission (NRC) and are subject to the FOCD restrictions set forth in 10 CFR 50.38. This Plan implements measures to fully negate FOCD with respect to matters involving the nuclear safety and security of CR-3 throughout the decommissioning of the CR-3 Facility. The same measures negate potential foreign influence.

b. This Plan describes the controls implemented to assure that the governance of ADP CR3, LLC (ADP CR3) and licensed activities undertaken by ADP CR3 are not subject to FOCD within the meaning of 10 CFR 50.38 and Section 103.d of the Atomic Energy Act of 1954, as amended (Section 103.d of the Act) (collectively the FOCD requirements).

c. Upon transfer of the Licenses to ADP CR3, ADP CR3 will be responsible for the maintenance and decommissioning of the CR-3 Facility. ADP CR3 is a wholly owned subsidiary of Accelerated Decommissioning Partners, LLC (ADP), which is a joint venture of NorthStar Group Services, Inc. (NorthStar) (75%) and Orano Decommissioning Holdings LLC (Orano) (25%). Orano is owned by Orano USA LLC, which was formerly known as AREVA Nuclear Materials, LLC. Orano USA LLC, is owned by Orano SA, a French Société Anonyme,[1] which is majority owned by the French State.

d. This Plan has been developed using the guidance provided by the NRC's "Final Standard Review Plan on Foreign Ownership, Control, or Domination," 64 FR 52355 (September 28, 1999) (FOCD SRP). Defense in depth is provided through a number of measures in order to ensure that there is U.S. control over matters relating to nuclear safety and security. These measures effectively negate the risk that Orano or its parent companies might exercise control, domination, or influence over matters that are required to be under U.S. control pursuant to the terms of 10 CFR 50.38.

e. The negation measures are implemented primarily through the terms of the Limited Liability Agreement of Accelerated Decommissioning Partners, LLC dated February 7, 2017 (the ADP LLC Agreement). Additional requirements and further

[1] A Société Anonyme is a public limited company similar to a corporation under U.S. law.

details regarding implementation of the negation measures are included in this Plan.

f. Upon acceptance of this Plan, changes to this Plan may only be made upon the recommendation of ADP CR3's CEO and approval by NorthStar. However, any proposed change that would result in a decrease in the effectiveness of this Plan will not be implemented without the prior approval of the NRC.

g. The FOCD negation measures described in this Plan have been implemented in the ADP LLC Agreement, which provides for the governance of ADP. ADP CR3 will provide NRC with 30 days prior written notice before implementing any material changes to the FOCD negation measures in the ADP LLC Agreement.

II. GOVERNANCE OF ADP AND ADP CR-3

a. ADP CR3 is a single Member managed limited liability company that is managed by ADP. As such, ADP controls the actions taken by ADP CR3. ADP is managed by its Members, NorthStar and Orano through their Member Representatives. The NorthStar Member Representative, a U.S. citizen, votes 75% and exercises control over the management of ADP's day-to-day business affairs and decision-making (including that of ADP's wholly owned subsidiaries), except for certain actions reserved for "Special Member Approval" that require unanimous approval. In any event, the terms of the ADP LLC Agreement provide that NorthStar has the exclusive right to exercise ADP's authority over the matters that are required to be under U.S. control pursuant to the restrictions of 10 CFR 50.38, which includes matters undertaken by ADP CR3. This is provided for in Section 11.4 of the ADP LLC Agreement, which states as follows:

11.4 Foreign Ownership, Control, and Domination Negation Action Plan

(a) For the purpose of compliance with FOCD Requirements, NorthStar shall have the exclusive authority to approve the following actions, and the Company shall not, and the Members, Officers and agents acting on the Company's behalf shall not, approve of or take any of the following actions without obtaining the approval of NorthStar:

(i) any matter that, in view of U.S. laws or regulations, requires or makes it reasonably necessary to assure U.S. control;

(ii) any matter relating to nuclear safety, security or reliability, including the following matters:

(1) implementation or compliance with any NRC generic letter, bulletin, order, confirmatory order or similar requirement issued by the NRC;

(2) prevention or mitigation of a nuclear event or incident or the unauthorized release of radioactive material;

(3) placement or restoration of the plant in a safe condition following any nuclear event or incident;

(4) compliance with the Atomic Energy Act of 1954 (as in effect from time to time), the Energy Reorganization Act of 1974 (as in effect from time to time), or any NRC rule;

(5) obtaining of, or compliance with, any specific license issued by the NRC and its technical specifications;

(6) conformance with a specific Final Safety Analysis Report, or other licensing basis document; and

(7) implementation of security plans and procedures, control of security information, administration of access to controlled security information, and compliance with government clearance requirements regarding access to restricted data;

(iii) any other issue reasonably determined by NorthStar, in its prudent exercise of discretion, to be an exigent nuclear safety, security or reliability issue; and

(iv) appointment of any Chief Executive Officer and Chief Nuclear Officer, and any successor thereof.

(b) If and to the extent that under Applicable Law, including as a result changes to any FOCD Requirements or FOCD Guidance (including the NRC's anticipated issuance of a new Regulatory Guide and Standard Review Plan regarding FOCD Requirements) NorthStar is not required to have exclusive authority to approve any of the actions in Section 11.4(a), then the Members agree to amend Section 11.4(a) in order to eliminate such action to the extent no longer required by Applicable Law, provided that (i) after such amendment Section 11.4(a) complies with Applicable Law, including FOCD Requirements, and (ii) such amendment is approved by the NRC if then required by Applicable Law, including FOCD Requirements.

b. NorthStar is not now, and will not in the future become, owned, controlled, or dominated by any alien, foreign corporation, or foreign government as contemplated in the FOCD Requirements and NRC guidance concerning the implementation thereof. Furthermore, the NorthStar Member Representative, and any CEO or CNO of ADP or ADP CR-3 appointed by NorthStar to serve in such office, will be a U.S. citizen.

c. In order to underscore the special role of the NorthStar Member Representative in assuring U.S. control is exercised to comply with NRC requirements, the NorthStar Member Representative will execute a certificate acknowledging the protective measures undertaken by ADP, as reflected in this Plan and the ADP LLC Agreement. The certificate provides as follows:

Certificate Regarding FOCD

By execution of this Certificate, I acknowledge the protective measures that have been taken by Accelerated Decommissioning Partners, LLC (ADP) through adoption and implementation of the provisions of Section 11.4 of its Limited Liability Company Agreement ("ADP LLC Agreement"), in order to protect against and negate the potential of any foreign ownership, control or domination (FOCD) of ADP or its subsidiaries within the meaning of 10 CFR 50.38.

I further acknowledge that I have a special role to assure that actions taken by ADP and its subsidiaries be in compliance with the ADP LLC Agreement, and acknowledge that the United States Government has placed its reliance on me as a United States citizen to exercise my best efforts in performing this special role. I will report any FOCD or foreign influence issue to the NRC.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Duke Energy Florida, LLC to Approve Transaction with Accelerated Decommissioning Partners, LLC for Accelerated Decommissioning Services at the CR3 Facility, Transfer of Title to Spent Fuel, and Assumption of Operations of the CR3 Facility Pursuant to the NRC License, and Request for Waiver From Future Application of Rule 25-6.04365, F.A.C. for Nuclear Decommissioning Study	DOCKET NO.: 20190140-EI Dated: April 14, 2020

DUKE ENERGY FLORIDA, LLC'S SECOND SUPPLEMENTAL RESPONSE TO STAFF'S FIRST REQUEST FOR PRODUCTION OF DOCUMENTS (NOS. 1-7)

Duke Energy Florida, LLC, ("DEF"), by and through undersigned counsel, hereby serves its second supplemental response to request number 2 of *Staff's First Request for Production of Documents to Duke Energy Florida, LLC (Nos. 1-7)* served on August 14, 2019, as follows:

DOCUMENTS REQUESTED

2. Please provide copies of all public documents filed by DEF with the NRC to implement its transaction with ADP CR3 LLC (ADPCR3) concerning the decommissioning of NRC License No. DPR -72.

RESPONSE:

Documents responsive to this request are attached hereto as Bates Nos. DEF RESP STAFF 1ST POD - 000001 through DEF RESP STAFF 1ST POD - 000240.

SUPPLEMENTAL RESPONSE:

Supplemental documents responsive to this request are attached hereto as Bates Nos. DEF SUPP RESP STAFF 1ST POD - 000349 through DEF SUPP RESP STAFF 1ST POD - 000358.

SECOND SUPPLEMENTAL RESPONSE:

Supplemental documents responsive to this request are attached hereto as Bates Nos. DEF 2ND SUPP RESP STAFF 1ST POD – 000380 through DEF 2ND SUPP RESP STAFF 1ST POD – 000401.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 10, 2020

Mr. Terry D. Hobbs
General Manager, Decommissioning
Crystal River Nuclear Plant (NA2C)
15760 W. Power Line Street
Crystal River, FL 34428-6708

SUBJECT: CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT - TRANSFER OF LICENSED AUTHORITY FROM DUKE ENERGY FLORIDA, LLC TO ADP CR3, LLC

Dear Mr. Hobbs:

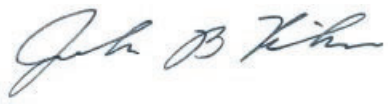
By letter dated April 1, 2020 (Agencywide Documents Access and Management System Accession No. ML20069A028), the Nuclear Regulatory Commission (NRC) issued an Order consenting to the transfer to ADP CR3, of DEF's licensed authority under Facility Operating License No. DPR-72 for the Crystal River Unit 3 Nuclear Generating Plant (CR-3) and the general license for the CR-3 independent spent fuel storage installation (ISFSI) to possess, maintain, and decommission CR-3 and its ISFSI.

Following issuance of the Order consenting to the transfer, several minor errors were identified in the associated safety evaluation. A corrected copy of the safety evaluation is being provided for your records. The areas of edit are marked by change bars.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's ADAMS. The ADAMS is accessible from the NRC Web site at https://www.nrc.gov/reading-rm/adams.html.

Should you have any questions regarding this letter, please contact me at 301-415-3017 or via e-mail at John.Hickman@nrc.gov.

Sincerely,



John B. Hickman, Project Manager
Reactor Decommissioning Branch
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket Nos.: 50-302 and 72-1035

Enclosure: Safety Evaluation

cc: w/enclosures: Crystal River ListServ

SUBJECT: CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT - TRANSFER OF LICENSED AUTHORITY FROM DUKE ENERGY FLORIDA, LLC TO ADP CR3, LLC **DATED: April 10, 2020**

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ADAMS Accession No.: ML20101G579 ***via Email**

OFFICE	DUWP	DUWP	DUWP
NAME	JHickman	BWatson*	JHickman
DATE	4 / 10 / 2020	4 / 10 / 2020	4 / 10 / 2020

OFFICIAL RECORD COPY

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS RELATED TO TRANSFER OF LICENSED AUTHORITY FROM DUKE ENERGY FLORIDA, LLC TO ADP CR3, LLC FOR FACILITY OPERATING LICENSE NO. DPR-72 AND ITS GENERALLY LICENSED INDEPENDENT SPENT FUEL STORAGE INSTALLATION AND TRANSFER OF OWNERSHIP FROM DUKE ENERGY FLORIDA, LLC TO ADP SF1, LLC FOR THE GENERALLY LICENSED INDEPENDENT SPENT FUEL STORAGE INSTALLATION AND THE STORED MATERIAL

CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT

DOCKET NOS. 50-302 AND 72-1035

1.0 INTRODUCTION

By application dated June 14, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML19170A194 and ML19170A195), including proprietary financial information provided as Enclosure 1P, “Decommissioning Services Agreement,” and Enclosure 2P, “Form of Support Agreements,” as supplemented by letters dated January 17, 2020 (ADAMS Accession No. ML20017A216), and March 5, 2020 (ADAMS Accession No. ML20065K737), Duke Energy Florida, LLC (DEF), on behalf of itself and ADP CR3, LLC (ADP CR3) (collectively, the Applicants), requested that the U.S. Nuclear Regulatory Commission (NRC, the Commission) consent to the transfer to ADP CR3 of DEF’s licensed authority under Facility Operating License No. DPR-72 for the Crystal River Unit 3 Nuclear Generating Plant (CR-3) and the general license for the CR-3 Independent Spent Fuel Storage Installation (ISFSI) (collectively, the licenses) to possess, maintain, and decommission CR-3 and its ISFSI (collectively, the CR-3 facility). Specifically, this request was submitted to the NRC for approval pursuant to Section 184, “Inalienability of Licenses,” of the Atomic Energy Act of 1954, as amended (AEA), and Sections 50.80, “Transfer of licenses,” and 72.50, “Transfer of license,” of Title 10 of the *Code of Federal Regulations* (10 CFR). The Applicants also requested that the NRC approve a conforming amendment to the CR-3 license to reflect the proposed transfer pursuant to 10 CFR 50.90, “Application for amendment of license, construction permit, or early site permit.”

Upon approval and consummation of the proposed transfer, ADP CR3 would assume control of, and managerial responsibility for, all licensed activities, including decommissioning of the CR-3 facility and its associated buildings and structures. ADP CR3 would be licensed to possess, maintain, and decommission the CR-3 facility. Following the proposed transfer, DEF would continue to own the CR-3 facility, as well as its associated assets and real estate (including its nuclear decommissioning trust (NDT)), except for the ISFSI, the spent nuclear fuel, the high-level radioactive waste, the greater than Class C (GTCC) waste, and the associated storage canisters, which would be owned, but not possessed, by ADP SF1, LLC (ADP SF1), an affiliate of ADP CR3. In addition to maintaining the existing NDT, DEF would also be responsible for directing the trustee of the NDT to disburse funds to pay for the costs of decommissioning as work is completed. The Applicants have also agreed that ADP SF1 would enter into a Purchase and Sale Agreement with DEF, pursuant to which ADP SF1 would acquire the ISFSI, its associated equipment, and title to the spent nuclear fuel, the high-level radioactive waste, and the GTCC waste at the CR-3 facility. DEF would also assign to ADP SF1 its Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste (Standard Contract) with the U.S. Department of Energy (DOE). ADP SF1 would own, but not possess, the spent nuclear fuel and waste pursuant to the general license, while ADP CR3 would possess the spent nuclear fuel and waste under the licenses. ADP SF1 would also enter into an operating agreement with ADP CR3, under which ADP SF1 would pay ADP CR3 for all costs of operating, maintaining, and decommissioning the ISFSI, and for ultimately removing all material owned by ADP SF1 from the CR-3 site.

Notice of NRC consideration of the application was published in the *Federal Register* (FR) on October 11, 2019 (84 FR 54932) and included an opportunity to comment, request a hearing, and petition for leave to intervene. The supplemental letters dated January 17, 2020, and March 5, 2020, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's no significant hazards consideration determination.

2.0 BACKGROUND

CR-3 was a single unit pressurized water reactor (PWR) electric generating facility with a rated thermal power of 2,609 megawatts thermal. The facility was part of the larger Crystal River Energy Complex, located on the Gulf of Mexico in Citrus County, Florida, which consisted of the PWR, other associated plant equipment, and related site facilities, including the generally licensed CR-3 ISFSI. The operating license for CR-3 was issued on January 28, 1977, and commercial operation commenced on March 13, 1977.

By letter dated February 20, 2013 (ADAMS Accession No. ML13056A005), DEF notified the NRC that CR-3 had been permanently shutdown and that all fuel had been permanently removed from the reactor vessel.

By letter dated December 2, 2013, DEF submitted to the NRC the Post-Shutdown Decommissioning Activities Report (PSDAR) for CR-3, including a Site-Specific Decommissioning Cost Estimate (DCE) (ADAMS Accession Nos. ML13340A009 and ML13343A178, respectively). The PSDAR and DCE were submitted in accordance with the requirements of 10 CFR 50.82, "Termination of license," paragraph (a)(4)(i). By letter dated January 15, 2018, DEF certified to the NRC that all of the CR-3 spent fuel had been removed from the spent fuel pool and transferred to the CR-3 ISFSI (ADAMS Accession No. ML18015A006). As described in the PSDAR, DEF selected the SAFSTOR method of

decommissioning CR-3, with plans to complete radiological decommissioning by 2073 and to restore the site by 2074.

License Transfer Application

According to the application, the purpose of the proposed license transfer is to permit the accelerated radiological decommissioning of the non-ISFSI portions of the CR-3 site. ADP CR3 would assume control of, and managerial responsibility for, all licensed activities, including decommissioning of the CR-3 facility (i.e., CR-3 and the CR-3 ISFSI) and its associated buildings and structures. ADP CR3 would be licensed to possess, maintain, and decommission the CR-3 facility.

Under the terms of the proposed transaction, ADP CR3 would begin decommissioning activities promptly after the consummation of the transaction and would plan to complete radiological decommissioning and restoration of the non-ISFSI portions of the CR-3 site by 2027. According to the application, ADP CR3 would draw on the experience of individuals from its parent companies, NorthStar Group Services, Inc. (NorthStar) and Orano Decommissioning Holdings, LLC (Orano), as well as individuals from an affiliate of NorthStar, Waste Control Specialists, LLC (WCS). In addition, ADP CR3 would contract with WCS to take advantage of WCS's waste transportation and disposal experience and knowledge of best practices. WCS is a leader in low-level radioactive waste management, packaging, transportation, and disposal. It operates radioactive and hazardous waste disposal facilities in Texas, and has experience with on-site waste processing, management, packaging, and loading.

NorthStar is a large demolition and asbestos abatement company, and has extensive world-wide experience conducting environmental remediation activities and the decommissioning of large-scale industrial and commercial complexes. NorthStar also has radiological decommissioning experience through involvement with the decommissioning of four research reactors at the Universities of Buffalo, Arizona, Illinois, and Washington, which were licensed by the NRC. In addition, according to the license transfer application, NorthStar has been involved with decommissioning at the DOE Hanford and Savannah River sites and with the deconstruction of nuclear reactor laboratory facilities at several universities and has been awarded a contract to support the decommissioning of ten reactor sites in the United Kingdom. In October 2018, the NRC issued an Order approving the transfer of the Vermont Yankee Nuclear Power Station operating license to NorthStar (ADAMS Accession No. ML18248A096). As part of the review in support of the transfer, NorthStar was confirmed to meet the regulatory, legal, technical, and financial requirements necessary to qualify it as an NRC licensee (ADAMS Accession No. ML18242A639).

Decommissioning Services Agreement and Purchase and Sale Agreement

According to the license transfer application, ADP CR3 proposes to decommission the CR-3 facility pursuant to the terms of a Decommissioning Services Agreement (DSA) between DEF and ADP CR3. In addition, the Applicants have also agreed that ADP SF1 would enter into a Purchase and Sale Agreement (PSA) with DEF to acquire the ISFSI, its associated equipment, and title to the spent nuclear fuel, the high-level radioactive waste, and the GTCC waste at the CR-3 facility.

Copies of the DSA and Form of Support Agreements are provided as proprietary Enclosures 1P and 2P, respectively, to the June 14, 2019, application. Enclosures 1P and 2P contain sensitive unclassified non-safeguards information (proprietary commercial and financial information) that

is being withheld from public disclosure pursuant to 10 CFR 2.390, “Public inspections, exemptions, requests for withholding.” Redacted, non-proprietary versions of these documents are provided in Enclosures 1 and 6 to the application.

Revised PSDAR

By letter dated June 26, 2019, in support of the license transfer application, ADP CR3 submitted to the NRC a revised PSDAR for CR-3 (ADAMS Accession No. ML19177A080). By letter dated December 26, 2019, ADP CR3 submitted supplemental information in support of the review of the revised PSDAR (ADAMS Accession No. ML20006E788). The revised PSDAR, as supplemented, updates the information previously described in the original DEF 2013 PSDAR, based on and contingent upon the NRC’s approval and the consummation of the license transfer transaction. The revised PSDAR supplements the license transfer application.

3.0 REGULATORY EVALUATION

The proposed transaction described in the license transfer application involves the transfer to ADP CR3 of DEF’s licensed authority to possess, maintain, and decommission the CR-3 facility and the transfer to ADP SF1 of DEF’s ownership of the generally licensed independent spent fuel storage installation and the stored material and requires prior NRC approval. For such a transaction, the NRC must find that the proposed licensed operator is qualified and that the transaction is otherwise consistent with applicable provisions of law, NRC regulations, and orders issued by the NRC.

The request for approval of the proposed transaction as described above, and as discussed in this safety evaluation (SE), is made pursuant to 10 CFR 50.80(a), which states:

> No license for a production or utilization facility (including, but not limited to, permits under this part and part 52 of this chapter, and licenses under parts 50 and 52 of this chapter), or any right thereunder, shall be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of the license to any person, unless the Commission gives its consent in writing.

In addition, the regulations in 10 CFR 50.80(b) and (c) apply. Section 50.80(b) of 10 CFR states that an application for transfer of a license shall include as much of the information described in 10 CFR 50.33, “Contents of applications; general information,” and 10 CFR 50.34, “Contents of applications; technical information,” with respect to the identity and technical and financial qualifications of the proposed transferee as would be required by those sections if the application were for an initial license.

Section 50.80(c) of 10 CFR states, in part:

> …the Commission will approve an application for the transfer of a license, if the Commission determines: (1) That the proposed transferee is qualified to be the holder of the license; and (2) That transfer of the license is otherwise consistent with applicable provisions of law, regulations, and orders issued by the Commission pursuant thereto.

In 10 CFR 50.33(a) through (d), the NRC requires applicants to provide information including the name of the applicant, address of the applicant, description of the corporate structure of the

applicant, citizenship of the applicant, and foreign ownership, control, or domination of the applicant, as applicable

In addition, 10 CFR 50.33(f) states, in part:

> Except for an electric utility applicant for a license to operate a utilization facility of the type described in § 50.21(b) or § 50.22, [each application shall state] information sufficient to demonstrate to the Commission the financial qualification of the applicant to carry out, in accordance with regulations in this chapter, the activities for which the permit or license is sought.

Section 50.2, "Definitions," of 10 CFR states, in part, that an electric utility means:

> [A]ny entity that generates or distributes electricity and which recovers the cost of this electricity, either directly or indirectly, through rates established by the entity itself or by a separate regulatory authority.

The NRC staff applies the guidance in NUREG-1577, Revision 1, "Standard Review Plan on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance," dated February 1999 (ADAMS Accession No. ML013330264), to evaluate the financial qualifications of applicants to carry out the activities for which the permit or license is sought.

In addition, 10 CFR 50.33(k)(1) requires that applicants provide the information described in 10 CFR 50.75, "Reporting and recordkeeping for decommissioning planning," indicating how reasonable assurance will be provided that funds will be available to decommission the facility.

The regulation under 10 CFR 50.75 specifies how a licensee will provide reasonable assurance that funds will be available for the decommissioning process. Specifically, 10 CFR 50.75(b) requires that decommissioning financial assurance be provided in an amount not less than the minimum formula amount in 10 CFR 50.75(c). In 10 CFR 50.75(e), the NRC includes the methods acceptable to the agency for covering this decommissioning financial assurance amount, including using an NDT. Finally, 10 CFR 50.75(f) and (h) provide additional requirements on the reporting and management of NDTs.

In addition, 10 CFR 50.82(a)(8)(i) states that licensees may use NDTs if:

> (A) The withdrawals are for expenses for legitimate decommissioning activities consistent with the definition of decommissioning in § 50.2;
>
> (B) The expenditure would not reduce the value of the decommissioning trust below an amount necessary to place and maintain the reactor in a safe storage condition if unforeseen conditions or expenses arise; and
>
> (C) The withdrawals would not inhibit the ability of the licensee to complete funding of any shortfalls in the decommissioning trust needed to ensure the availability of funds to ultimately release the site and terminate the license.

In accordance with 10 CFR 50.2, the term "decommission" means to remove a facility or site safely from service and reduce residual radioactivity to a level that permits (1) release of the property for unrestricted use and termination of the license or (2) release of the property under restricted conditions and termination of the license.

Section 50.82(a)(8)(v) of 10 CFR requires power reactor licensees that have permanently ceased operations to provide to the NRC annually, by March 31, a decommissioning financial assurance status report. The report must include additional financial assurance to cover any projected shortfalls.

Section 50.54(bb) of 10 CFR requires, in part, a licensee to submit, for NRC review and preliminary approval, the program by which the licensee intends to manage and provide funding for the management of all spent nuclear fuel at the reactor following permanent cessation of operation of the reactor until title to the spent fuel and possession of the spent fuel is transferred to the DOE for its ultimate disposal in a repository. In addition, 10 CFR 50.82(a)(8)(vii) provides, in part, for the licensee's annual submittal to the NRC of a report on the status of its funding for managing spent fuel. If the funds accumulated do not cover the projected cost, a plan to obtain additional funds to cover the cost must be included.

Section 50.34(b)(6) of 10 CFR requires that applicants provide certain information on facility operation. It requires, in part, that the information includes:

> (i) The applicant's organizational structure, allocations or responsibilities and authorities, and personnel qualification requirements.
>
> (ii) Managerial and administrative controls to be used to assure safe operation.

Section 50.34(b)(7) of 10 CFR also requires that applicants provide the following information in the final safety analysis report:

> The technical qualifications of the applicant to engage in the proposed activities in accordance with the regulations in this chapter.

The NRC staff uses, in part, the following regulatory guidance to evaluate whether the qualifications of licensees would be affected by proposed transfers:

> (1) NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition," Chapter 13, "Conduct of Operations," Section 13.1.1, Revision 6, "Management and Technical Support Organization," dated August 2016 (ADAMS Accession No. ML15005A449), which provides guidance for the review of changes to the technical organization or personnel qualifications proposed as a result of an operating license transfer. Specifically, Section I.4, "Reviews of Operating License Transfers," states that the applicant for transfer of an operating license should provide a description of the organization to support plant operations, which should include (1) organizational charts of the corporate-level management and technical support organizations, emphasizing the changes to be made as a result of the transfer, (2) the relationship of the nuclear-oriented parts of the organization to the rest of the corporate organization, and (3) description of the specific provisions which have been made for uninterrupted technical support for operations.
>
> (2) NUREG-0800, Chapter 13, Sections 13.1.2–13.1.3, Revision 7, "Operating Organization," dated August 2017 (ADAMS Accession No. ML15007A296),

> which provides guidance for the review of changes to the operating organization proposed as a result of an operating license transfer.

The purpose of this evaluation is to ensure that the proposed corporate management is involved with, informed of, and dedicated to the safe operation, maintenance, and decommissioning of the facility and that adequate technical and financial resources will be provided to support these activities.

In addressing foreign ownership, control, or domination (FOCD) issues, Section 103d of the AEA provides, in relevant part, that no license may be issued to:

> [A]ny corporation or other entity if the Commission knows or has reason to believe it is owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government.

The NRC's regulation in 10 CFR 50.38, "Ineligibility of certain applicants," is the regulatory provision that implements the FOCD provisions of the AEA. The NRC staff evaluates license transfer applications in a manner that is consistent with the guidance provided in the NRC "Final Standard Review Plan on Foreign Ownership, Control, or Domination," as published in the *Federal Register* on September 28, 1999, to determine whether the proposed transferee is owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government (64 FR 52357-52359). The NRC's position on FOCD, outlined in the SRP, states that "the foreign control prohibition should be given an orientation toward safeguarding the national defense and security." Further, the SRP on FOCD outlines how the effects of foreign ownership may be mitigated through implementation of a "negation action plan" to ensure that any foreign interest is effectively denied control or domination over the licensee.

The NRC staff also reviews information that relates to nuclear onsite property damage insurance requirements under 10 CFR 50.54(w) and the Price-Anderson insurance and indemnity requirements under Section 170 of the AEA and 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements."

With respect to the transfer of control of a license for an ISFSI, 10 CFR 72.50(a) states:

> No license or any part included in a license issued under this part for an ISFSI or MRS [Monitored Retrievable Storage Installation] shall be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of the license to any person, unless the Commission gives its consent in writing.

Section 72.6(b) of 10 CFR states:

> A general license is hereby issued to receive title to and own spent fuel, high-level radioactive waste, or reactor-related GTCC waste without regard to quantity. Notwithstanding any other provision of this chapter, a general licensee under this paragraph is not authorized to acquire, deliver, receive, possess, use, or transfer spent fuel, high-level radioactive waste, or reactor-related GTCC waste except as authorized in a specific license.

Section 72.210 of 10 CFR states:

> A general license is hereby issued for the storage of spent fuel in an independent spent fuel storage installation at power reactor sites to persons authorized to possess or operate nuclear power reactors under 10 CFR part 50….

Section 72.30 of 10 CFR discusses financial assurance for decommissioning ISFSIs.

Finally, with respect to the requested conforming license amendment, 10 CFR 50.90 states, in part:

> Whenever a holder of a license … desires to amend the license…, application for an amendment must be filed with the Commission … fully describing the changes desired, and following as far as applicable, the form prescribed for original applications.

Pursuant to 10 CFR 2.1315, where administrative license amendments are necessary to reflect an approved license transfer, such amendments will be included in the order that approves the license transfer.

4.0 FINANCIAL EVALUATION

4.1 Financial Qualifications

As described in this SE, by letter dated February 20, 2013, DEF notified the NRC that CR-3 had been permanently shutdown and that all fuel had been permanently removed from the reactor vessel. Therefore, pursuant to 10 CFR 50.82(a)(2), the CR-3 license no longer authorizes operation of the reactor or emplacement or retention of fuel in the reactor vessel.

Following the proposed transfer to ADP CR3 of operating authority for decommissioning, DEF would continue to own CR-3 and the existing NDT and would be responsible to direct the trustee to disburse funds to pay for the costs of decommissioning as work is completed. The Applicants stated that, as the current (and proposed continuing) owner of CR-3, DEF recovers its cost of electricity for CR-3 either directly or indirectly through rates established by the Florida Public Service Commission. The Applicants further stated that, following the proposed transaction, DEF would continue to recover its cost of electricity through the Florida Public Service Commission, including the ability to seek further ratepayer funding for decommissioning. Therefore, DEF is considered an “electric utility,” as defined in 10 CFR 50.2. As such, it is presumed to be financially qualified to own and pay for the operation of CR-3, and is exempt from the financial qualifications information requirements associated with reactor operations pursuant to 10 CFR 50.33(f) and in accordance with Section III.1.b of NUREG-1577, Rev. 1.

The proposed transfer of operating authority to ADP CR3 would only involve the operating authority for decommissioning since the CR-3 license no longer authorizes operation. Therefore, ADP CR3 would not conduct the operations contemplated by the financial qualifications provisions of 10 CFR 50.33(f), but rather all of its licensed activities would involve the possession of radioactive material in connection with maintaining the safe condition of the plant, radiological decommissioning of the CR-3 site (including the ISFSI), license termination, and operational responsibilities associated with spent fuel management.

The NRC staff’s financial review pursuant to 10 CFR 50.33(f), 10 CFR 50.33(k)(1), 10 CFR 50.75, and 10 CFR 50.82(a), includes an analysis of the projected costs for decommissioning

the CR-3 facility and terminating the license, and spent fuel management until DOE takes title to and possession of the fuel. For a facility in decommissioning, a licensee is required to execute financial plans for spent fuel management under 10 CFR 50.54(bb) and report annually on the status of funding for radiological decommissioning and spent fuel management under 10 CFR 50.82(a)(8)(v) to (vii).

4.2 Decommissioning Financial Assurance

As of April 30, 2019, the CR-3 NDT had a market value of approximately $731 million. Under the terms of the DSA, DEF will execute the Fourth Amendment to Amended and Restated Nuclear Decommissioning Trust Agreement, to segregate $540 million into an "IOI Decommissioning Account" dedicated to funding ADP CR3's decommissioning activities necessary to achieve the ISFSI-Only Interim End-State Conditions, as defined in the DSA (partial license termination). According to the application, all remaining assets in the CR-3 NDT will be held in a "Crystal River Reserve Account," within the trust and will remain dedicated to the decommissioning of CR-3. The right to draw on the source of funds described herein, and the *pro forma* projected costs set forth in Enclosure 4 of the application, provide the requisite financial information for the proposed license transfer consistent with 10 CFR 50.33(f). The availability of the funds in the CR-3 NDT satisfies the "prepayment" method of providing financial assurance pursuant to 10 CFR 50.75(e)(1).

As discussed below, the existing NDT funds provide an appropriate basis for the financial qualifications of ADP CR3. ADP CR3 has demonstrated that with conservative NDT investments and based on the estimate of remaining costs expected for decommissioning, the required funding level in the accounts will be sufficient to pay all of the annual expected costs of decommissioning the CR-3 facility. In addition, major decommissioning work will be performed under fixed-price or fixed-unit contracts that are subject to performance bonds to guarantee the performance of the tasks.

Pursuant to 10 CFR 50.2, "Decommission," means to remove a facility or site safely from service and reduce residual radioactivity to a level that permits: (1) release of the property for unrestricted use and termination of the license, or (2) release of the property under restricted conditions and termination of the license. The existing NDT for CR-3 was created in compliance to 10 CFR 50.75 and the funds within the NDT were collected while the facility was operating. As described below, the NRC staff's review of decommissioning financial assurance assesses whether the Applicants have provided information sufficient to demonstrate that there is reasonable assurance that, after the proposed license transfer, funds will be available to cover the costs of the radiological decommissioning of CR-3 and its ISFSI.

As described in DEF's 2013 PSDAR, the current decommissioning plan for CR-3 is for DEF to complete decommissioning within a 60-year period using the SAFSTOR method. The revised PSDAR provided in support of the proposed license transfer reflects ADP CR3's plan to, if the transfer is consummated, complete the decommissioning of the non-ISFSI portions of the CR-3 site as soon as 2026, but no later than the end of 2030 (i.e., use the DECON method). The revised PSDAR includes:

1. A description of the planned, accelerated decommissioning activities along with a schedule for their accomplishment and
2. A site-specific decommissioning cost estimate for the planned, accelerated

decommissioning, including the projected spent fuel management costs, license termination costs, and site restoration costs.

Under the revised PSDAR, as compared to DEF's 2013 PSDAR and 2019 Decommissioning Funding Status Report for CR-3 (ADAMS Accession No. ML19086A046), the proposed change in decommissioning method from SAFSTOR to DECON would result in an overall 47-year acceleration of the site closure, from 2074 to approximately 2026, and a license termination cost reduction in an amount of approximately $247 million.

In the license transfer application dated June 14, 2019, the Applicants provided financial projections for the duration of the CR-3 decommissioning project using the DECON method, including the amount of decommissioning trust funds in the NDT. They included a cash flow analysis that assumed an NDT balance of approximately $731 million (as of April 30, 2019), as well as estimated costs for radiological decommissioning and site restoration (totaling approximately $540 million) and spent fuel management. The NRC staff's analysis determined that the amount of funds available in the NDT is sufficient to cover the entirety of estimated decommissioning costs.

On March 28, 2014, pursuant to 10 CFR 50.12, "Specific exemptions," DEF requested an exemption from 10 CFR 50.82(a)(8)(i)(A) to allow the use of a portion of the funds from the CR-3 NDT for spent fuel management activities and site restoration activities (ADAMS Accession No. ML14098A037). Additionally, DEF requested an exemption from 10 CFR 50.75(h)(2) for all CR-3 NDT disbursements for spent fuel management and site restoration costs to be made without prior notice, similar to withdrawals in accordance with 10 CFR 50.82(a)(8). The NRC staff's analysis of this exemption request was performed separately from this SE and, on January 26, 2015, the staff approved the exemption request (ADAMS Accession No. ML14247A545). If the proposed license transfer were granted and consummated, these exemptions would remain in place as DEF would continue to be the owner licensee for CR-3. In its review of the exemption request, the staff concluded that reasonable assurance exists that adequate funds will be available in the NDT to complete radiological decommissioning, spent fuel management, and site restoration activities within the scope of the exemption request. The staff's findings from its evaluation of the exemption request were considered as part of its analysis of the proposed license transfer and support the staff's conclusion that the Applicants' use of the NDT for activities associated with spent fuel management and site restoration will not negatively impact the availability of funding for radiological decommissioning.

In addition to the NDT funds, according to the application and under Section 3.15 of the DSA, ADP SF1 will establish an "ISFSI Decommissioning Trust" for the purpose of holding funds to decommission the ISFSI. At the time of the license transfer, ADP CR3 and ADP SF1 will be required to provide financial assurance to decommission the ISFSI using one of the methods set forth in 10 CFR 72.30(e). The application further states that ADP SF1 may propose to deposit $3.95 million into the trust, which, at a two percent real rate of return, would be projected to grow to $5.4 million by the year 2037, when the ISFSI is expected to be decommissioned. The application also provides that ADP CR3 will have access to other financial assurance provided by its parent companies, NorthStar and Orano. Specifically, NorthStar will enter into a financial Support Agreement in the amount of $105 million, and Orano will enter into a financial Support Agreement in the amount of $35 million. According to the application, these agreements will provide an additional $140 million if needed for ADP CR3 to meet its obligations, so that CR-3 is maintained and decommissioned in compliance with NRC requirements. Lastly, according to the application and under Section 3.14 of the DSA, ADP CR3 will establish a "Provisional Trust,"

which will be initially funded with $20 million. ADP CR3 will retain six percent of each invoice for decommissioning services performed and paid from the NDT and deposit those amounts into the Provisional Trust. This retainage will continue until the Provisional Trust contains $50 million to provide additional financial assurance of ADP CR3's performance. The last $20 million in the Provisional Trust will not be released until the NRC approves partial license termination.

The NRC staff reviewed the information provided in the application, including the additional funding mechanisms of the ISFSI Decommissioning Trust, the financial Support Agreements, and the Provisional Trust. Based on this review, the staff's independent cash flow analysis in Attachment 1 to this SE, and the imposition of the following license conditions, the staff finds that the Applicants have provided information sufficient to demonstrate that there is reasonable assurance that, after the proposed license transfer, funds will be available to cover the costs of the radiological decommissioning of CR-3 and its ISFSI. Therefore, the staff concludes that the proposed license transfer satisfies 10 CFR 50.80 with respect to decommissioning financial assurance.

1. The financial Support Agreement between NorthStar Group Services, Inc. and ADP CR3 and ADP SF1 in the amount of $105 million, and the financial Support Agreement between Orano USA LLC and ADP CR3 and ADP SF1 in the amount of $35 million, to assure the ability of ADP CR3 and ADP SF1 to pay the expenses of: (i) maintaining and decommissioning the CR-3 facility and ISFSI safely; (ii) protecting the public health and safety; and (iii) meeting NRC requirements, are effective. These Support Agreements may not be voided, canceled, or modified without the prior written consent of the NRC staff. The Director of the Office of Nuclear Material Safety and Safeguards shall be informed, in writing, no later than 10 working days after any funds are provided under the terms of the Support Agreements.

2. ADP CR3 shall establish a Provisional Trust consistent with Section 3.14 of the "Decommissioning Services Agreement by and between Duke Energy Florida, LLC, as Company and ADP CR3, LLC, as Contractor and ADP SF1, LLC, as Buyer Dated as of May 29, 2019" (DSA). The Provisional Trust will be initially funded with $20 million. ADP CR3 will retain six percent of each invoice for decommissioning services performed and paid from the nuclear decommissioning trust and deposit those amounts into the Provisional Trust to fund the Provisional Trust to $50 million. The last $20 million in the Provisional Trust will not be released until the ISFSI-Only Interim End-State Conditions, as defined in the DSA, are achieved.

3. ADP CR3 shall provide financial assurance in a form and in an amount meeting the requirements of 10 CFR 72.30(e) to the ISFSI Decommissioning Trust established under Section 3.15 of the DSA. The ISFSI Decommissioning Trust shall be established to hold the financial assurance until the End-State Conditions, as defined in the DSA, are achieved.

4.3 Spent Fuel Management Financial Assurance

After the closing of the proposed transaction, ADP SF1 would be a general licensee under 10 CFR 72.6, retaining ownership of and title to all spent nuclear fuel and all rights and obligations under the Standard Contract. The NDT would be retained by DEF. In addition, ADP

CR3 would be a general licensee under 10 CFR 72.210, and would be responsible for operating, maintaining, and decommissioning the CR-3 ISFSI. According to the application and the revised PSDAR, operating and maintaining the ISFSI (i.e., spent fuel management) will cost approximately $71.1 million from 2020-2027 and $213.9 from 2027-2037, for a total of approximately $285.02 million.

In their license transfer application dated June 14, 2019, the Applicants provided their funding plan for spent fuel management costs, with additional assurance provided by DOE reimbursements, financial Support Agreements totaling $140 million, and a Provisional Trust with an initial funding of $20 million and an ultimate funding of $50 million. The NRC staff's review of the Applicants' funding plan for spent fuel management costs is discussed below.

In analyzing the use of excess NDT funds to cover spent fuel management costs, the NRC staff considered its findings from its evaluation of the 2014 exemption request, discussed above, as well as its independent cash flow analysis. The staff determined that the Applicants' use of the NDT for spent fuel management costs will not negatively impact the availability of funding for radiological decommissioning. Additionally, the excess NDT funds will be sufficient to cover the costs associated with spent fuel management.

Moreover, the financial Support Agreements and Provisional Trust discussed above will provide the funds necessary to pay ADP CR3 in advance of ADP SF1 recovering spent fuel management costs under the Standard Contract from the DOE through litigation or under a settlement, or to pay for ADP CR3's costs that are not recoverable from the DOE.

The Applicants also committed to having a performance bond in place to cover annual spent fuel management costs in the event that a settlement agreement with the DOE is not entered into. The bond will be renewed annually until a settlement is reached. As assurance regarding the Applicants' reliance on a future DOE settlement agreement, the NRC staff imposes the following license condition:

> ADP CR3 must ensure that a performance bond is obtained if a settlement agreement with the U.S. Department of Energy (DOE) on DOE reimbursements for spent fuel management expenses is not entered into by January 1, 2025. The performance bond will be effective January 1, 2025, initially in an amount equal to one year's worth of spent fuel management expenses. ADP CR3 will thereafter ensure that a performance bond is maintained for subsequent years, in the amount of the applicable estimated annual expense, until a settlement agreement with the DOE is entered into.

The NRC staff finds that the assumption of DOE reimbursement is a reasonable source of additional funding. In recent years, the DOE reimbursements have become more consistent and predictable despite the longevity of the litigation process and complexity of the DOE standard settlement agreements. Moreover, as further assurance of their reliance on a future DOE settlement agreement, the Applicants agreed to a license condition to obtain a performance bond to cover spent fuel management costs if a settlement agreement has not been reached in the timeframe anticipated. Therefore, the NRC staff concludes that DOE reimbursements, as proposed by the Applicants, provide a reasonable source of funds, in addition to the other sources of funds discussed above, to cover spent fuel management costs.

Based on its review, in consideration of the above analysis and the license conditions, the NRC staff finds that the Applicants have provided information sufficient to demonstrate that there is

reasonable assurance that, after the proposed license transfer, funds will be available to cover the costs of spent fuel management in accordance with the requirements of 10 CFR 50.33(f) and 10 CFR 50.54(bb). Therefore, the staff concludes that the proposed license transfer satisfies 10 CFR 50.80 with respect to spent fuel management financial assurance.

4.4 Financial Evaluation Conclusion

As described above, the NRC staff evaluated the Applicants' financial qualifications, including decommissioning financial assurance and spent fuel management financial assurance. Based on this evaluation and an independent cash flow analysis, the staff determined that there is reasonable assurance that the funds in the NDT will be sufficient to cover the costs of the radiological decommissioning of CR-3 and its ISFSI, spent fuel management, and site restoration. Additional assurance of adequate funds is provided by the license conditions requiring an ISFSI Decommissioning Trust, financial Support Agreements, a Provisional Trust, and a performance bond or settlement agreement with the DOE. Therefore, the staff concludes that DEF and ADP CR3 are financially qualified to hold the CR-3 license, as proposed.

5.0 STANDARD CONTRACT FOR DISPOSAL OF SPENT NUCLEAR FUEL AND/OR HIGH-LEVEL RADIOACTIVE WASTE

Upon closing, ADP SF1 will hold title to the spent nuclear fuel at CR-3 and will maintain the associated Standard Contract, Standard Contract No. DE-CR01-83NE44382, including all rights and obligations under that contract. The Standard Contract was entered into by the predecessor to DEF, Florida Power Corporation, and the United States of America, represented by the DOE, to govern the disposal of spent nuclear fuel generated at CR-3. ADP CR3 will have the authority for the possession, maintenance, and decommissioning of the CR-3 facility, which includes spent fuel management and the maintenance and security of the ISFSI.

6.0 ANTITRUST CONSIDERATION

The AEA does not require or authorize antitrust reviews of post-operating license transfer applications (*Kansas Gas and Electric Co., et al.* (Wolf Creek Generating Station, Unit 1), CLI-99-19, 49 NRC 441 (1999)). The application post-dates the issuance of the operating license for the unit under consideration in this SE and, therefore, no antitrust review is required or authorized. Additionally, the subject license does not contain any antitrust conditions; therefore, there are no antitrust issues to be considered in connection with the conforming license amendment.

7.0 FOREIGN OWNERSHIP, CONTROL, OR DOMINATION

The application states that ADP CR3 is a wholly owned subsidiary of Accelerated Decommissioning Partners, LLC (ADP), which is 75% owned and controlled by NorthStar. According the application, NorthStar is not now, and will not in the future become, owned, controlled, or dominated by any alien, foreign corporation, or foreign government as contemplated in the foreign ownership, control, or domination (FOCD) requirements and the NRC's guidance concerning the implementation thereof. NorthStar is a Delaware corporation that is owned and controlled by NorthStar Group Holdings, LLC (Holdings), which is owned and controlled by the J.F. Lehman private equity funds. Ultimately, control is exercised by four U.S. citizens, who are the managing members of JFL GP Investors IV, LLC. Each of the funds has multiple limited partnership investors, who are passive investors. While these passive investors may include foreign investors, NorthStar is not aware of any that hold more than 5% of the

indirect ownership interests of NorthStar. In addition, the passive investors are not able to exercise control over the private equity funds or NorthStar. The other 25% interest in ADP is owned and controlled by Orano, whose parent company is owned by Orano SA, a French Société Anonyme,[1] which is majority owned by the French State. Although Orano is ultimately majority owned by a foreign state, Orano only owns 25% of ADP, and it is not able to exercise control over ADP.

When ADP was formed, NorthStar and Orano included FOCD negation measures in Section 11.4 of the Limited Liability Agreement of ADP, LLC. The terms of Section 11.4 ensure that NorthStar has exclusive authority to decide matters relating to nuclear safety or security, and the ability to appoint any Chief Executive Officer or Chief Nuclear Officer. These measures ensure U.S. control of ADP for purposes of FOCD compliance, and fully negate any potential for FOCD over the licenses. In addition, ADP CR3 has developed a Negation Action Plan addressing FOCD.

The NRC staff reviewed the information provided in the application and the proposed Negation Action Plan measures provided in the supplemental letter dated January 17, 2020. Based on this review and with the imposition of the following license condition, the staff has reasonable assurance that the licensee will not be foreign owned, controlled, or dominated:

> ADP CR3 must ensure that:
>
> The NorthStar Group Services, Inc. (NorthStar) Member Representative of Accelerated Decommissioning Partners, LLC (ADP) (NorthStar Member Representative) has the responsibility and exclusive authority to ensure and shall ensure that the business and activities of ADP CR3 and ADP SF1 with respect to the CR3 license is at all times conducted in a manner consistent with the public health and safety, and common defense and security of the United States.
>
> The NorthStar Member Representative, and any Chief Executive Officer (CEO) or Chief Nuclear Officer (CNO) of ADP or ADP CR3 appointed by NorthStar to serve in such office, shall be a U.S. citizen.
>
> The licensees shall not approve or take any action involving matters necessary to ensure U.S. control without the approval of NorthStar. This includes any matters relating to nuclear safety, security, or reliability, the appointment of any CEO and CNO, and any successor thereof, or any other issue reasonably determined by NorthStar in its prudent exercise of discretion.
>
> Changes to the ADP CR-3, LLC Negation Action Plan may only be made upon recommendation of ADP CR3's CEO and approval by NorthStar. Any proposed change resulting in a decrease in the effectiveness of the plan will not be implemented without prior NRC approval. ADP CR3 will provide the NRC with 30 days prior written notice before the implementation of any material changes to the negation measures in the Limited Liability Agreement of Accelerated Decommissioning Partners, LLC dated February 7, 2017 (ADP LLC Agreement).
>
> If at any time NorthStar is not required to have exclusive authority to approve any of the actions in Section 11.4(a) of the ADP LLC Agreement, any amendments to Section

[1] A Société Anonyme is a public limited company similar to a corporation under U.S. law.

11.4(a) must comply with applicable law, including FOCD requirements, and must be approved by the NRC.

8.0 NUCLEAR INSURANCE AND INDEMNITY

Pursuant to the requirements of the Price-Anderson Act (Section 170 of the AEA) and the NRC's implementing regulations in 10 CFR Part 140, the current indemnity agreement must be modified to reflect that, after the proposed license transfer takes effect, DEF (licensed owner) and ADP CR3 (licensed operator for decommissioning) will be the sole licensees for CR-3 for the purposes of decommissioning the site. Consistent with NRC practice, the NRC staff will require DEF and ADP CR3 to provide evidence that they have obtained the appropriate amount of insurance pursuant to 10 CFR 140.11(a)(4) and 10 CFR 50.54(w), and that the insurance is effective concurrent with the date of the license transfer and amended indemnity agreement. Because the issuance of the amended license is directly tied to completion of the proposed license transfer, the Order approving the transfer will be conditioned as follows:

> Prior to the closing of the license transfer, DEF and ADP CR3 shall provide the Director of the NRC's Office of Nuclear Material Safety and Safeguards satisfactory documentary evidence that they have obtained the appropriate amount of insurance required of a licensee under 10 CFR 140.11(a)(4) and 10 CFR 50.54(w), consistent with the exemptions issued for CR-3 on April 27, 2015, and March 31, 2016.

Based on the above, the NRC staff concludes that the proposed license transfer, as conditioned, satisfies the nuclear insurance and indemnity requirements of 10 CFR Part 140 and 10 CFR Part 50.

9.0 TECHNICAL QUALIFICATIONS EVALUATION

With the completion of the proposed transfer actions, ADP CR3 would assume responsibility for and control over the CR-3 facility. ADP CR3 is a wholly owned subsidiary of ADP, which is a joint venture of NorthStar (75%) and Orano (25%). Orano is owned by Orano USA LLC, which was formerly AREVA Nuclear Materials, LLC. NorthStar and Orano formed ADP to decommission commercial nuclear reactors, to acquire control of reactor sites, and to execute prompt decommissioning. ADP CR3 would draw on the experience of individuals from its parent companies, NorthStar and Orano, as well as an affiliate of NorthStar, WCS. Additionally, ADP CR3 intends to staff technical support positions that are important to the safe storage of fuel and conduct of radiological protection with key members of the existing CR-3 staff who are already trained and qualified and would fill positions with responsibilities analogous to their pre-license transfer responsibilities. According to the Applicants, the organizational staffing levels after the transfer would be comparable to the expected evolution of the existing SAFSTOR organization and would be aligned with that appropriate for a decommissioning plant with all fuel in dry storage and dormant former power block buildings, while ensuring that sufficient qualified resources are available to fully meet the requirements of the licenses and applicable NRC regulations.

NorthStar has more than 30 years of experience as a general decommissioning contractor on commercial and industrial projects while performing decontamination and decommissioning work, including on asbestos projects. NorthStar has worked on the decommissioning at the DOE Hanford and Savannah River sites, as well as on the decommissioning of the research reactors at the Universities of Buffalo, Arizona, Illinois, and Washington. Orano has more than

twenty years of experience in radiological work, including overseeing spent nuclear fuel, the segmentation of reactor pressure vessels and internals, radioactive waste management, nuclear materials transportation, and other decommissioning work in the United States, France, Canada, the United Kingdom, Germany, and Japan. Orano and its affiliates have specific PWR experience including reactor pressure vessels and internals segmentation and packaging at the Yankee Rowe, Maine Yankee, and Connecticut Yankee nuclear power plants. WCS is a treatment, storage, and disposal company dealing in radioactive, hazardous, and mixed wastes. WCS is licensed to treat, store, and dispose of Class A, B, and C low level radioactive waste.

The Applicants stated that ADP CR3 employees and contractors would not be employed without being qualified for their positions in accordance with the applicable Quality Assurance Program and regulatory requirements, including the guidance in NRC Regulatory Guide 1.8, "Qualification and Training of Personnel for Nuclear Power Plants" (ADAMS Accession No. ML19101A395). ADP CR3 would also adopt the existing Quality Assurance (QA), emergency preparedness, radiological protection, security, and training procedures and establish these functions using parent company personnel and existing incumbent personnel, as well as qualified contractors. DEF would transfer to ADP CR3 control over the assets related to CR-3 that will be needed to maintain the CR-3 facility and the site in accordance with NRC requirements. These assets include, in addition to the structures and equipment, the necessary books, records, safety and maintenance manuals, and engineering construction documents.

The Applicants provided an organization chart showing the planned project organization. Resumes for key management personnel were also provided. The Applicants plan to establish an organization responsible for radiological safety, industrial health and safety, fuel storage, regulatory affairs, quality assurance, licensing, environmental issues, reactor pressure vessel segmentation, large component removal, decontamination and decommissioning, engineering and operations, and waste operations. This organization would provide a nuclear management team with control over the decontamination and decommissioning operations. An ISFSI Manager would be responsible for maintaining a trained and qualified staff to support the safe and secure storage of fuel, as well as the performance of required ISFSI maintenance and surveillance activities. The individual filling this position would be required to have extensive knowledge of ISFSI-related 10 CFR Parts 50 and 72 license requirements, Site Emergency Plan, Security Plan, and QA program requirements and related administrative controls. The ISFSI Manager would be required to have, at a minimum, a bachelor's degree in Engineering or Science or Equivalent, and 10 years of power plant experience of which a minimum of 3 years shall be related to nuclear power plant experience. The Operations Manager, the Facility Maintenance Coordinator, the Technical Specialist, the Licensing Manager, the Radiation Protection Manager, and the Security Manager would report to the ISFSI Manager and would fulfill the functional responsibilities performed by existing CR-3 staff in comparable positions in the SAFSTOR organization. The individual filling the Radiation Protection Manager position would be required to have education, training, and experience consistent with ANSI/ANS-3.1-2014, "Selection, Qualification, and Training of Personnel for Nuclear Power Plants," Section 4.3.3, "Radiation Protection," middle level manager and radiation protection manager.

Based on its review, the NRC staff determined that the Applicants have described a project organization that will provide the requisite experience and expertise for the decommissioning of the CR-3 facility, the maintenance of the CR-3 ISFSI, and compliance with the requirements of the licenses and the Commission's regulations. Therefore, the NRC staff finds that, after the proposed transfer of licensed authority from DEF to ADP CR3, ADP CR3 will (1) have an acceptable corporate organization, (2) retain an acceptable onsite organization, and (3) have adequate resources to support the safe maintenance and decommissioning of the CR-3 facility.

The Applicants' submittal adequately addresses the relevant requirements of 10 CFR 50.34(b) and 10 CFR 50.80. Accordingly, the staff concludes that ADP CR3 would be technically qualified to hold CR-3 Facility Operating License No. DPR-72 and the associated general license for the CR-3 ISFSI.

10.0 SUMMARY

Based on its review of the information provided in the license transfer application, as supplemented, its independent analysis, and the conditions described herein, the NRC staff finds that DEF, with respect to being the licensed owner of CR-3, and ADP CR3, with respect to being the licensed operator of the CR-3 facility, have satisfied the NRC's financial qualifications; decommissioning funding assurance; antitrust; foreign ownership, control, or domination; nuclear insurance and indemnity; and technical qualifications requirements. Therefore, the staff concludes that: (1) the proposed transferee is qualified to be the holder of the licenses and (2) the transfer of the licenses is otherwise consistent with applicable provisions of law, regulations, and orders issued by the Commission pursuant thereto.

11.0 CONFORMING AMENDMENT

The Applicants requested a conforming amendment to Facility Operating License No. DPR-72 for CR-3. No physical or operational changes to the CR-3 facility were requested. The proposed conforming amendment reflects the license transfer action. For example, the proposed changes to the license include adding "ADP CR3, LLC" as a licensee name and delineating the possession of the CR-3 facility by ADP CR3, the ownership of CR-3 by DEF, and the ownership of the spent fuel and GTCC in the CR-3 ISFSI by ADP SF1, LLC. The Applicants also requested editorial changes such as deleting obsolete or unnecessary text.

The NRC staff reviewed the proposed changes to the license and determined that they involve no safety questions, are administrative in nature, and are necessary to reflect the approved license transfer. Accordingly, the staff concludes that the proposed conforming amendment is acceptable. The amendment shall be issued and made effective at the time of the completion of the proposed transaction.

12.0 STATE CONSULTATION

In accordance with the Commission's regulations, the NRC staff notified the Florida State official, Cindy Becker, Chief, Bureau of Radiation Control, Florida Department of Health, of the proposed license transfer and issuance of the conforming amendment on March 6, 2020. The State official had no comments.

13.0 ENVIRONMENTAL CONSIDERATION AND NO SIGNIFICANT HAZARDS CONSIDERATION

The subject application is for approval of a transfer of licenses issued by the NRC and for approval of an associated amendment of licenses required to reflect the approval of the transfer. Accordingly, the actions involved meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(21). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the approval of the license transfer application and conforming license amendment.

As provided in 10 CFR 2.1315, unless otherwise determined by the Commission with regard to

a specific application, the Commission has determined that any amendment to the license of a utilization facility or to the license of an ISFSI, which does no more than conform the license to reflect the transfer action involves no significant hazards consideration. No contrary determination has been made by the Commission with regard to this specific application.

14.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) the proposed transferee is qualified to be the holder of the licenses and (2) transfer of the licenses is otherwise consistent with applicable provisions of law, regulations, and orders issued by the Commission pursuant thereto.

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: M. Henderson, NMSS/REFS
J. Hickman, NMSS/DUWP

Date: April 1, 2020

Attachment 1

Cash Flow Analysis
Crystal River Unit 3 Nuclear Generating Plant
Nuclear Decommissioning Trust
(millions of 2019$)

Year	Beginning-of-Year NDT Balance	License Termination and Site Restoration Cost	Spent Fuel Management Cost	Total Cost	NDT Earnings (2% real rate of return)	End-of-Year NDT Balance
2020	$731,000	$39,254	$7,820	$47,074	$13,679	$697,605
2021	$697,605	$108,356	$7,976	$116,332	$11,625	$592,898
2022	$592,898	$128,620	$19,770	$148,390	$8,890	$453,398
2023	$453,398	$70,909	$9,617	$80,526	$7,457	$380,330
2024	$380,330	$116,880	$8,464	$125,344	$5,100	$260,085
2025	$260,085	$41,474	$8,634	$50,108	$4,200	$214,177
2026	$214,177	$34,507	$8,806	$43,313	$3,417	$174,281
2027	$174,281	$0	$19,448	$19,448	$3,097	$157,930
2028	$157,930	$0	$19,448	$19,448	$2,770	$141,251
2029	$141,251	$0	$19,448	$19,448	$2,436	$124,239
2030	$124,239	$0	$19,448	$19,448	$2,096	$106,887
2031	$106,887	$0	$19,448	$19,448	$1,749	$89,188
2032	$89,188	$0	$19,448	$19,448	$1,395	$71,135
2033	$71,135	$0	$19,448	$19,448	$1,034	$52,721
2034	$52,721	$0	$19,448	$19,448	$665	$33,938
2035	$33,938	$0	$19,448	$19,448	$290	$14,780
2036	$52,721	$0	$19,448	$19,448	$665	$33,938
2037	$33,938	$0	$19,449	$19,449	$290	$14,779
	Totals:	$540,000	$285,016	$825,016		

Notes:

1. The 2020 beginning-of-year NDT balance is the fully funded balance as of April 30, 2019. It does not include additional financial assurance as stated in the application or DSA (i.e., financial Support Agreements, Provisional Trust, or ISFSI Decommissioning Trust).
2. Assumes no credit for DOE reimbursements of spent fuel management costs.
3. ISFSI decommissioning costs are included in the Spent Fuel Management Cost column of the above cash flow analysis.

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DEF's Response to Staff's Third Set of Production of Documents No. 15.

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 30
PARTY: STAFF HEARING EXHIBITS
DESCRIPTION: Terry Hobbs

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Duke Energy Florida, LLC to Approve Transaction with Accelerated Decommissioning Partners, LLC for Accelerated Decommissioning Services at the CR3 Facility, Transfer of Title to Spent Fuel, and Assumption of Operations of the CR3 Facility Pursuant to the NRC License, and Request for Waiver From Future Application of Rule 25-6.04365, F.A.C. for Nuclear Decommissioning Study

DOCKET NO.: 20190140-EI

Dated: December 20, 2019

DUKE ENERGY FLORIDA, LLC'S RESPONSES TO STAFF'S THIRD REQUEST FOR PRODUCTION OF DOCUMENTS (NO. 1)*

Duke Energy Florida, LLC, ("DEF"), by and through undersigned counsel, hereby responds to *Staff's Third Request for Production of Documents to Duke Energy Florida, LLC (No. 1)** served on November 22, 2019, as follows:

DOCUMENTS REQUESTED

1. Please refer to the Direct Testimony of Terry Hobbs, Exhibit (TH-2), page 7 of 12. A portion of the second full paragraph on page 7 reads: "shall include a certificate attesting that [Accelerated Decommissioning Partners] has completed the stated percentages of each of the Pay Items included in the disbursement certificate, and accompanied by reasonable supporting documentation to permit DEF to verify the sated percentage completion."

   a. Please provide a sample copy of an attestation certificate as referenced in the passage above.

   b. Please provide any listing of the "Pay Items" as referenced above.

---

* Staff's Third Request for Production of Documents (No. 15), incorrectly identified by Staff as No. 1.

RESPONSE to subpart a.:

Document responsive to this request is attached hereto as Bates No. DEF RESP STAFF 3RD POD – 000325.

RESPONSE to subpart b.:

Documents responsive to this request are attached hereto as Bates Nos. DEF RESP STAFF 3RD POD – 000326 through DEF RESP STAFF 3RD POD – 000328.

Proprietary & Confidential

APPLICATION FOR PAYMENT

ADP CR3, LLC
17101 Preston Road, Suite 115
Dallas, TX 75248
Office Phone: 425-881-0623
Cell Phone: 509-420-0675
lself@northstar.com

Project Name Crystal River Unit 3 Decommissioning
Project No TBD
Invoice # TBD
Contract No: TBD
Application Date TBD
BILL TO: Duke Energy Florida, LLC
Send to: DukeNuclearInvoices@onlinecapturecenter.com
RouteCode: PGNCR3

Period To:

Application is made for payment under the Contract as shown below and in Schedule I attached hereto:

1.	ORIGINAL CONTRACT SUM	$ -
2.	TOTAL AMOUNT COMPLETED TO DATE (Column E below)	$ -
3.	TOTAL AMOUNT PREVIOUSLY INVOICED	$ -
4.	CURRENT PAYMENT DUE (Line 2 less Line 3)	$ -
5.	BALANCE TO FINISH (Line 1 less Line 2)	$ -

DECLARATION AND CERTIFICATION

I, _____, hereby declare that I am the _____ of Contractor submitting this Application For Payment; that I am duly authorized to execute and deliver this Application For Payment on behalf of the Subcontractor, and that all information set forth in this Application For Payment is true, accurate, and complete as of its date.

I hereby certify, to the best of my knowledge and belief, that:

1) *The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the subcontract;*
2) *Payments to lower-tier subcontractors and suppliers have been made from previous payments received under the subcontract, and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with the lower-tier subcontractor; and*
3) *This request for progress payments does not include any amounts which will be withhold or retained from a lower-tier subcontractor or supplier in accordance with the terms and conditions of the lower-tier subcontract.*

Item No	Description of Work Activity or Other Item	Sheduled Value	% Complete to Date	Total Amount Completed to Date	Total Amount completed on Prior Application for Payment	Amount of This Application	**Payment Due**
Total	License Term	$ -	#DIV/0!	$ -	$ -	$ -	**$ -**

Name and Title of Contractor's Authorized Representative

Signature & Date

1. CONTRACTOR	2. CONTRACT		3. PROGRAM		4. REPORT PERIOD	
a. NAME	a. NAME		a. NAME		ADP CR3 License Termination	ADP CR3 Site Restoration
ADP CR3, LLC	Crystal River Unit 3 (CR3) Decommissioning		Current Month EV Update and Reporting			
b. LOCATION (Address and ZIP Code)	b. NUMBER		b. PHASE			
17101 Preston Road, Suite 115						
Dallas, TX 75248	c. TYPE	d. SHARE RATIO	c. EVMS ACCEPTANCE			
			X	(YYYYMMDD)		

FINAL SCHEDULE -

Control Account.Rollup	SCHECULED VALUE	PREVIOUS PERIODS	THIS PERIOD	TOTAL TO DATE	PERCENT COMPLETE	BALANCE TO FINISH	Current Period License Term	Current Period Site Restoration
	(A)	(B)	(C)	(D)	(E)	(F)		
	Contract	(prior application)	(D - B)	(A x E)	Input	(A - D)		
ITEM DESCRIPTION								
0 - Pre-Close Planning	$ -							
Balance of Plant D&D Planning	$ -							
LCR and RV/RVI Planning	$ -							
Transaction Closing Costs	$ -							
3 - Planning / Site Preparation	$ -	$ -	$ -	$ -	#DIV/0!	$ -		
D&D Planning & Preparations								
Facilities Modifications, Site Preparation								
Utilities Reactivation			$ -					
Containment Access, Waste Handling Areas			$ -					
Site Characterization			$ -					
LCR and RV/RVI Planning & Engineering				$ -				
General Transition Planning / Engineering			$ -	$ -		$ -		
Site / Plant Infrastructure Planning & Engineering			$ -	$ -		$ -		
RVI Planning & Engineering			$ -	$ -		$ -		
RV Planning & Engineering			$ -	$ -		$ -		
LCR Planning & Engineering			$ -	$ -		$ -		
Balance of Plant D&D Planning				$ -				
Temporary Utilities, Site Prep Planning			$ -	$ -		$ -		
Turbine, Condenser, Steam Gen. Removal Planning			$ -	$ -		$ -		
Systems Removal & Decontamination Planning			$ -	$ -		$ -		
Demolition Planning			$ -	$ -		$ -		
4 - Decommissioning	$ -	$ -	$ -				$ -	$ -
4A - Large Component Removal								
Reactor Internals Segmentation								
Reactor Internals Mobilization, Setup & Commissioning								
Reactor Internals Segmentation (Plenum Assemb.)								
Reactor Internals Segmentation (Core Spt. Assemb. / Remain)								
Reactor Internals Waste P,T&D								
Reactor Vessel Segmentation								
Reactor Vessel Mobilization, Setup & Commissioning								
Reactor Vessel Segmentation								
Reactor Vessel Waste P,T&D								
CRDMs, ICIs, Service Structure								
Reactor Coolant System								
Reactor Coolant System Piping								
Reactor Coolant System Pumps & Motors								

Control Account.Rollup	SCHECULED VALUE	PREVIOUS PERIODS	THIS PERIOD	TOTAL TO DATE	PERCENT COMPLETE	BALANCE TO FINISH	Current Period License Term	Current Period Site Restoration
	(A)	(B)	(C)	(D)	(E)	(F)		
	Contract	(prior application)	(D - B)	(A x E)	Input	(A - D)		
ITEM DESCRIPTION								
Pressurizer & Relief Tank								
Steam Generators Removal								
Steam Generators Waste P,T&D								
Main Turbine/Generator/Condensers								
Remove Turbines & Generator								
Remove Condensers								
Cascading Demo Costs								
Large Compont Removal Additional Cost								
Asbestos Abatement								
Remedial Action Surveys								
Remove Contaminated Outdoor Piping								
4B - Site Decontamination								
Remove Plant Systems								
Reactor Building								
Auxiliary Building (95' Elev.)								
Auxiliary Building (116' Elev. & Above)								
Intermediate Building								
Turbine Building								
Remove Plant Systems Waste P,T&D								
Decontaminate Buildings								
Reactor Building (95' Elev.)								
Reactor Building (119' Elev.)								
Reactor Building (160' Elev. & Above)								
Auxiliary Building								
Intermediate Building								
Miscellaneous Site Structures								
Decontaminate Buildings Waste P,T&D								
Reactor Building Waste P,T&D								
Auxiliary, Intermediate & Misc. Bldg. Waste P,T&D								
License Termination Planning								
Decon Additional Costs								
West Settling Pond								
Underground Services Excavation								
Transfer Canal Sand Removal								
Remedial Action Surveys								
Tooling & Equipment								
Lead Abatement								
4F - License Termination								
License Termination Planning, Surveys & Costs								
License Termination Survey								
Confirmation & Verification Surveys								
Terminate License								
5 - Site Restoration	$ -							
Demolition of Remaining Site Buildings								
Demolition, Backfill, Grade								
Turbine Building								
Miscellaneous Site Structures								
Auxiliary Building								

Control Account.Rollup	SCHECULED VALUE	PREVIOUS PERIODS	THIS PERIOD	TOTAL TO DATE	PERCENT COMPLETE	BALANCE TO FINISH	Current Period License Term	Current Period Site Restoration
	(A)	(B)	(C)	(D)	(E)	(F)		
	Contract	(prior application)	(D - B)	(A x E)	Input	(A - D)		
ITEM DESCRIPTION								
Reactor Building								
Intermediate Building								
Backfill & Grade								
Final Report to NRC								
Site Restoration Additional Costs								
Firing Range Closure								
Concrete Crushing, Security Barriers, Discharge Cofferdam								
TOTAL	$ -	$ -	$ -	$ -	#DIV/0!	$ -	$ -	$ -

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DEF's Response to Staff's Fourth Set of Production of Documents No. 16.

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 31
PARTY: STAFF HEARING EXHIBITS
DESCRIPTION: Terry Hobbs

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Duke Energy Florida, LLC to Approve Transaction with Accelerated Decommissioning Partners, LLC for Accelerated Decommissioning Services at the CR3 Facility, Transfer of Title to Spent Fuel, and Assumption of Operations of the CR3 Facility Pursuant to the NRC License, and Request for Waiver From Future Application of Rule 25-6.04365, F.A.C. for Nuclear Decommissioning Study	DOCKET NO.: 20190140-EI Dated: January 13, 2020

DUKE ENERGY FLORIDA, LLC'S RESPONSE TO STAFF'S FOURTH REQUEST FOR PRODUCTION OF DOCUMENTS (NO. 16)

Duke Energy Florida, LLC, ("DEF"), by and through undersigned counsel, hereby responds to *Staff's Fourth Request for Production of Documents to Duke Energy Florida, LLC (No. 16)* served on December 16, 2019, as follows:

DOCUMENTS REQUESTED

16. Referring to the Direct Testimony of witness Hobbs, Exhibit (TH-1), page 43 of 597, please provide the SNF PSA (Spent Nuclear Fuel Purchase and Sale Agreement) referenced in Article 4.1.

RESPONSE:

A copy of the Spent Nuclear Fuel Purchase and Sale Agreement was previously produced as part of Exhibit No.__ (TH-1) to the Direct Testimony of Terry Hobbs, specifically, at pages 85-114 of 597.

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DEF's Responses to Staff's Eighth Set of Production of Documents Nos. 25-26.

26 – Confidential DN. 03445-2020

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 32
PARTY: STAFF HEARING EXHIBITS
DESCRIPTION: Terry Hobbs

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Duke Energy Florida, LLC to Approve Transaction with Accelerated Decommissioning Partners, LLC for Accelerated Decommissioning Services at the CR3 Facility, Transfer of Title to Spent Fuel, and Assumption of Operations of the CR3 Facility Pursuant to the NRC License, and Request for Waiver From Future Application of Rule 25-6.04365, F.A.C. for Nuclear Decommissioning Study	DOCKET NO.: 20190140-EI Dated: June 30, 2020

DUKE ENERGY FLORIDA, LLC'S RESPONSE TO STAFF'S EIGHTH REQUEST FOR PRODUCTION OF DOCUMENTS (NOS. 25-26)

Duke Energy Florida, LLC, ("DEF"), by and through undersigned counsel, hereby serves its response to *Staff's Eighth Request for Production of Documents to Duke Energy Florida, LLC (Nos. 25-26)* served on June 18, 2020, as follows:

DOCUMENTS REQUESTED

25. Refer to DEF witness Hobb's direct testimony, Page 13, Lines 4-6. Please provide a copy of the Nuclear Regulatory Commission's "Order Approving Transfer Of Licensed Authority And Draft Conforming Administrative License Amendment (EA-20-045)."

RESPONSE:

DEF objects to this question because it is beyond the discovery deadline of June 29 set forth in the Order Establishing Procedure for this docket. Notwithstanding this objection, and without waiving same, please refer to DEF 2ND SUPP RESP STAFF 1ST POD – 000380 - DEF 2ND SUPP RESP STAFF 1ST POD – 000401, which was previously produced with DEF's second supplemental response to Staff's First Request for Production of Documents served on April 14, 2020.

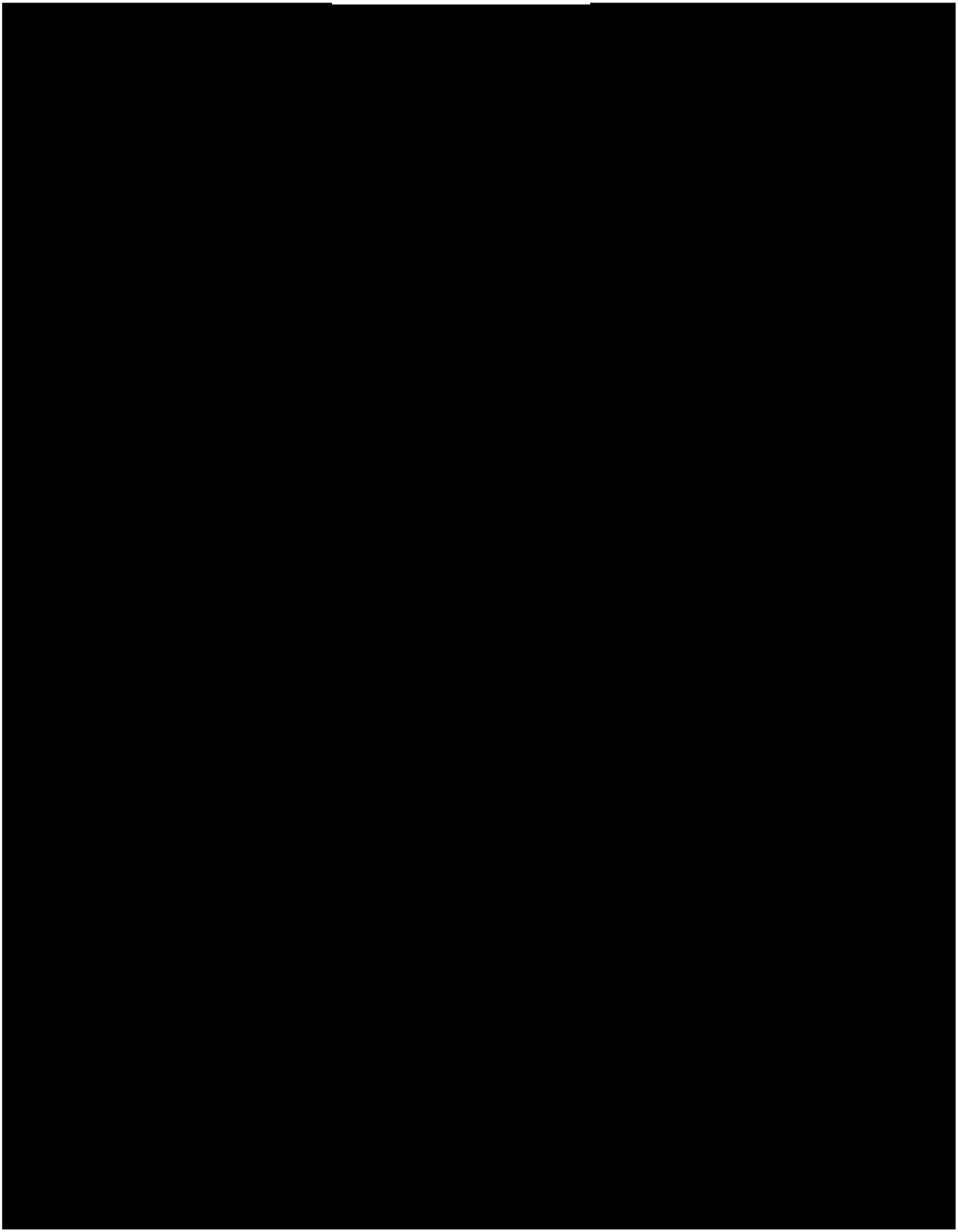
26. Refer to DEF witness Hobb's direct testimony, Page 13, Lines 6-10. Please provide a copy of the private letter ruling from the Internal Revenue Service confirming the proposed transaction does not disqualify the NDT from remaining a qualified fund for tax purposes and that the contract payments made from the NDT are a permissible use of the qualified NDT.

RESPONSE:

DEF objects to this question because it is beyond the discovery deadline of June 29 set forth in the Order Establishing Procedure for this docket. Notwithstanding this objection, and

without waiving same, the requested document is identified as Bates Nos. DEF RESP STAFF 8TH POD – 000434 to DEF RESP STAFF 8TH POD – 000443. DEF notes that the entirety of this document is confidential and subject to DEF's Eighth Request Confidential Classification.

REDACTED



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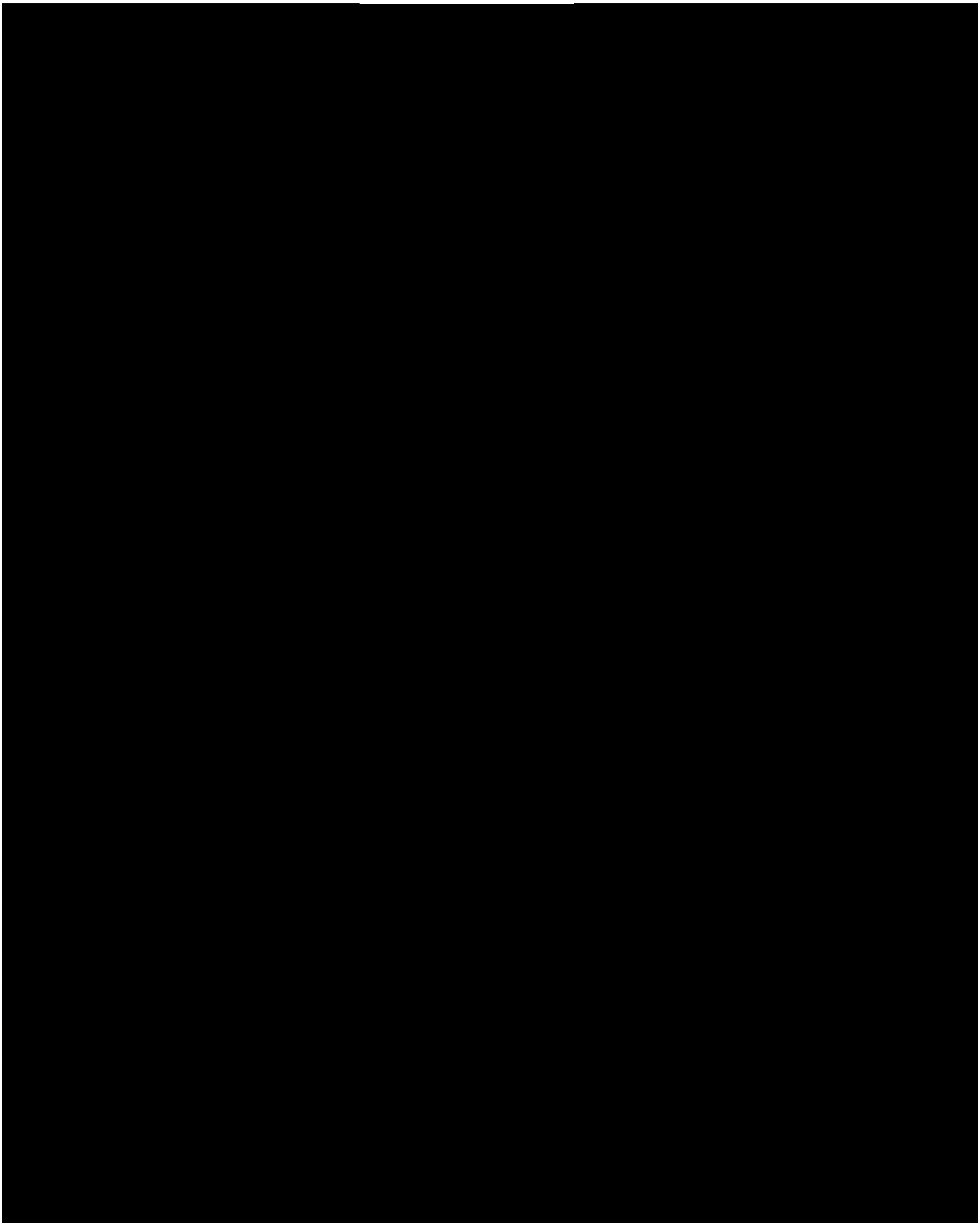

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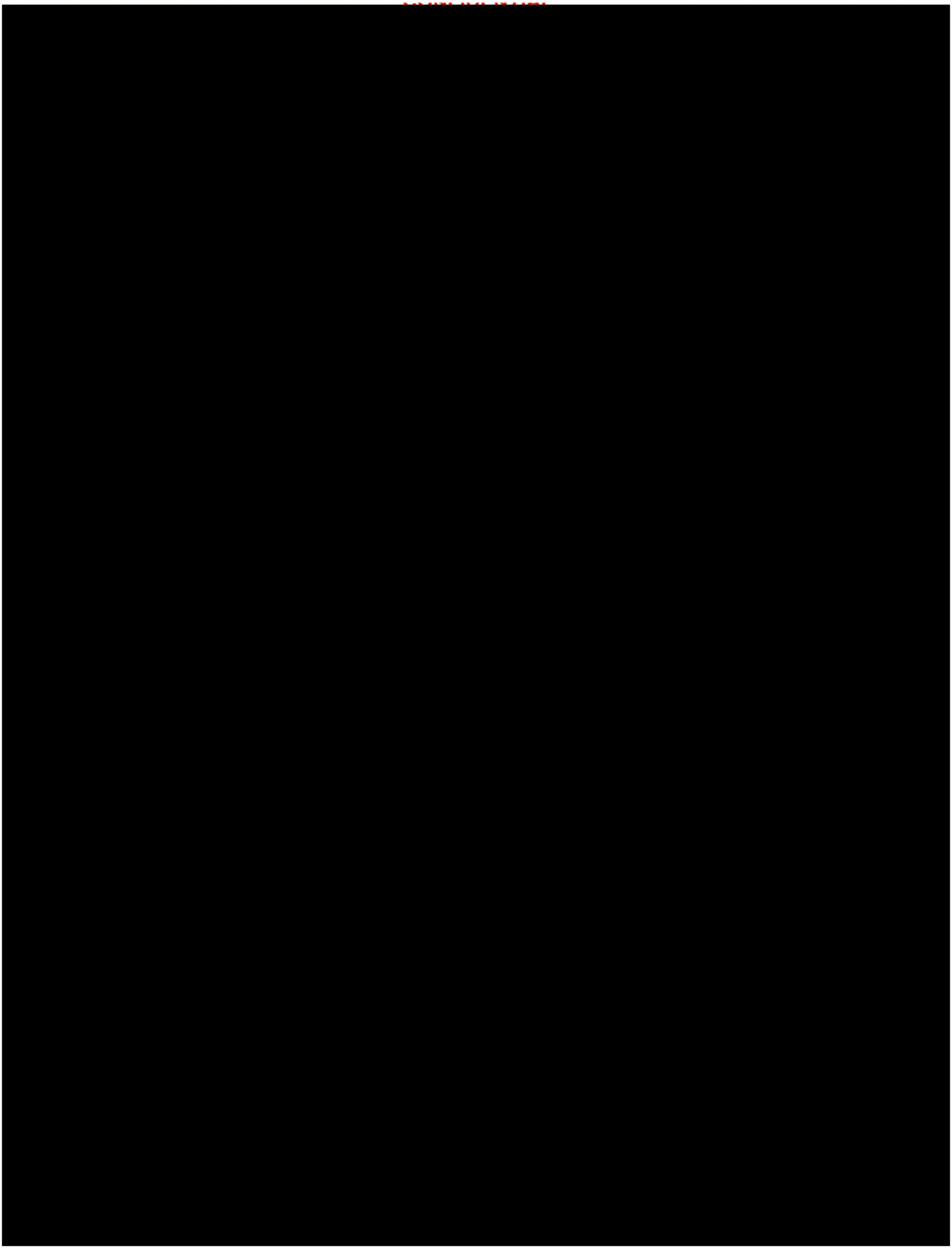

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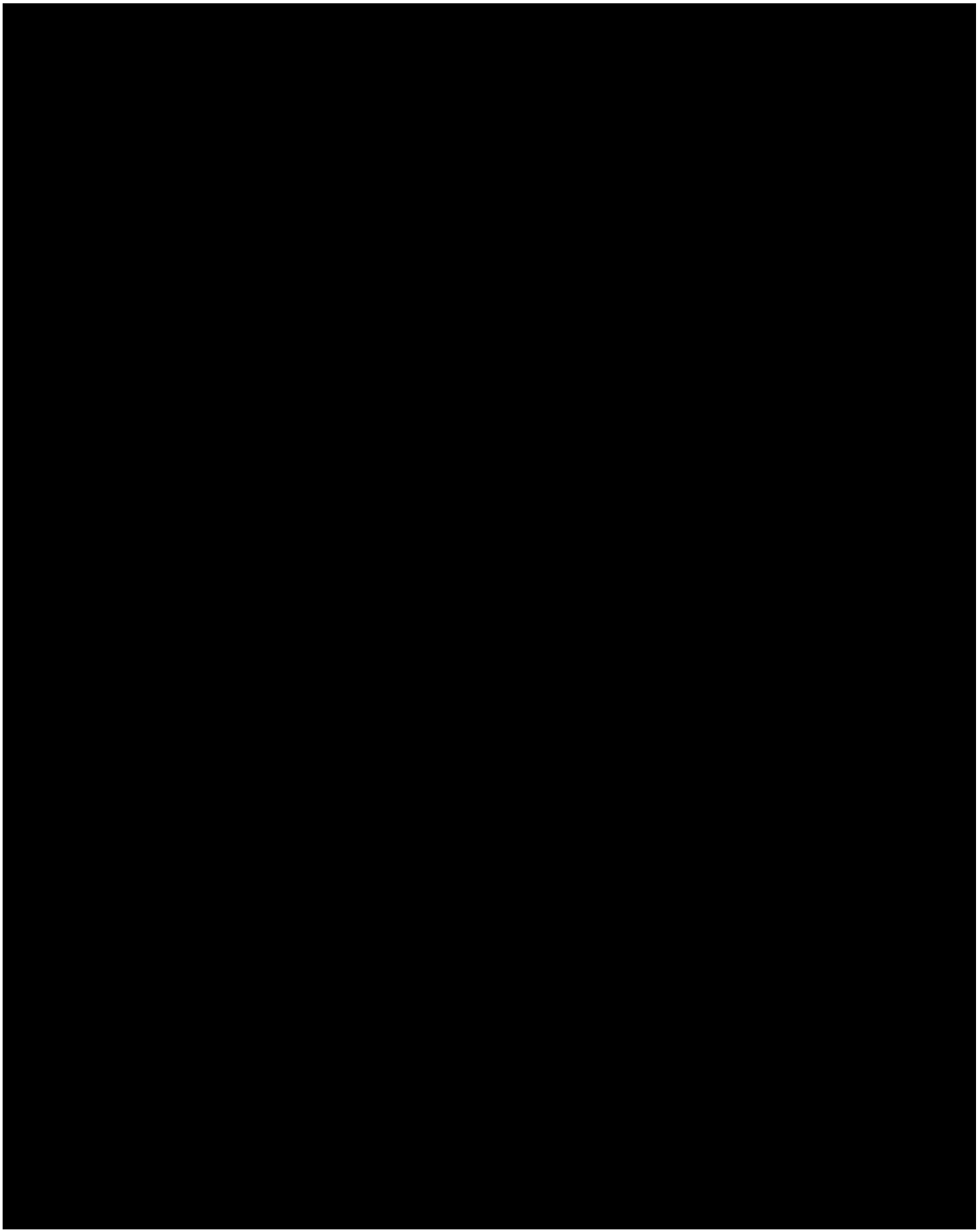

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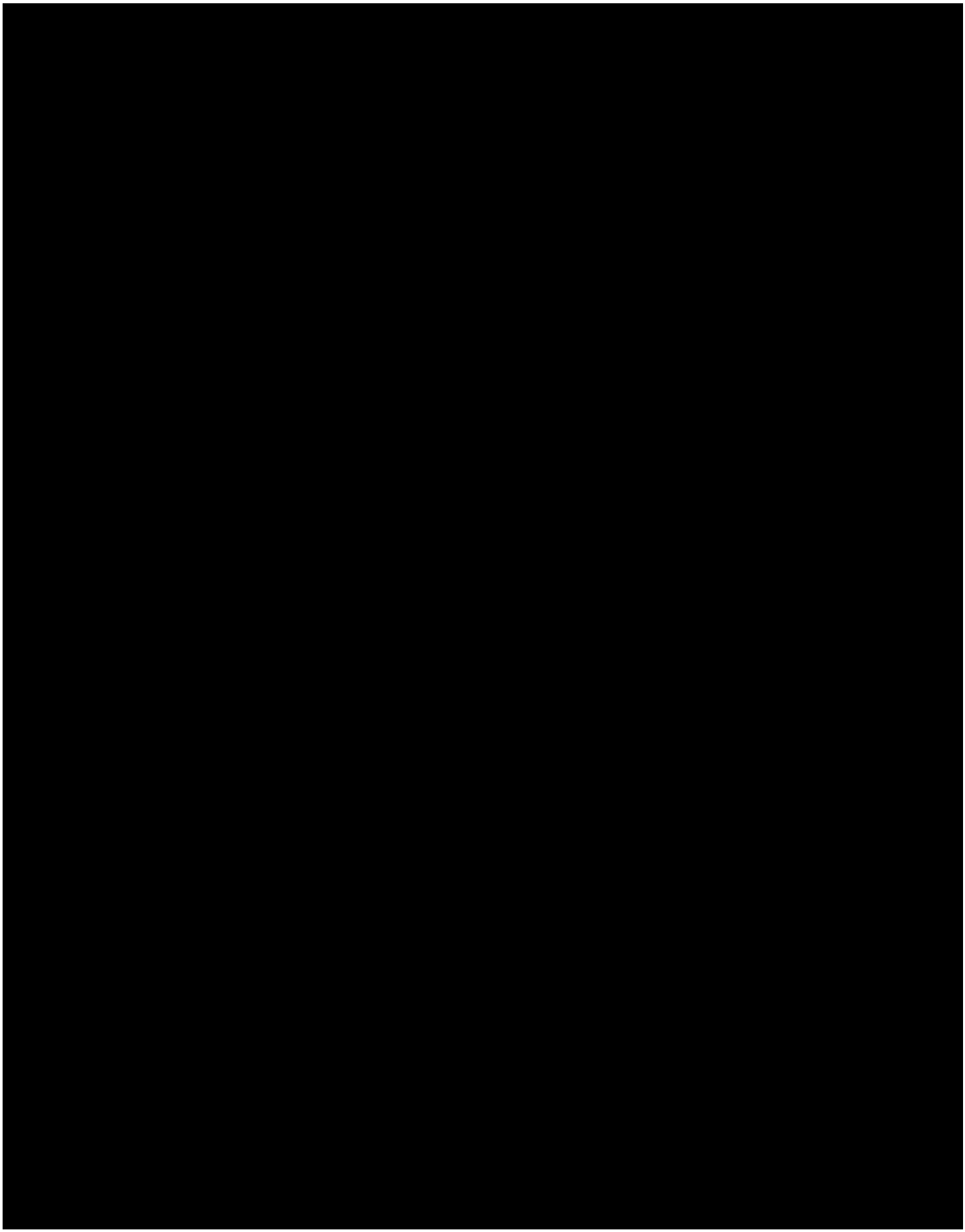

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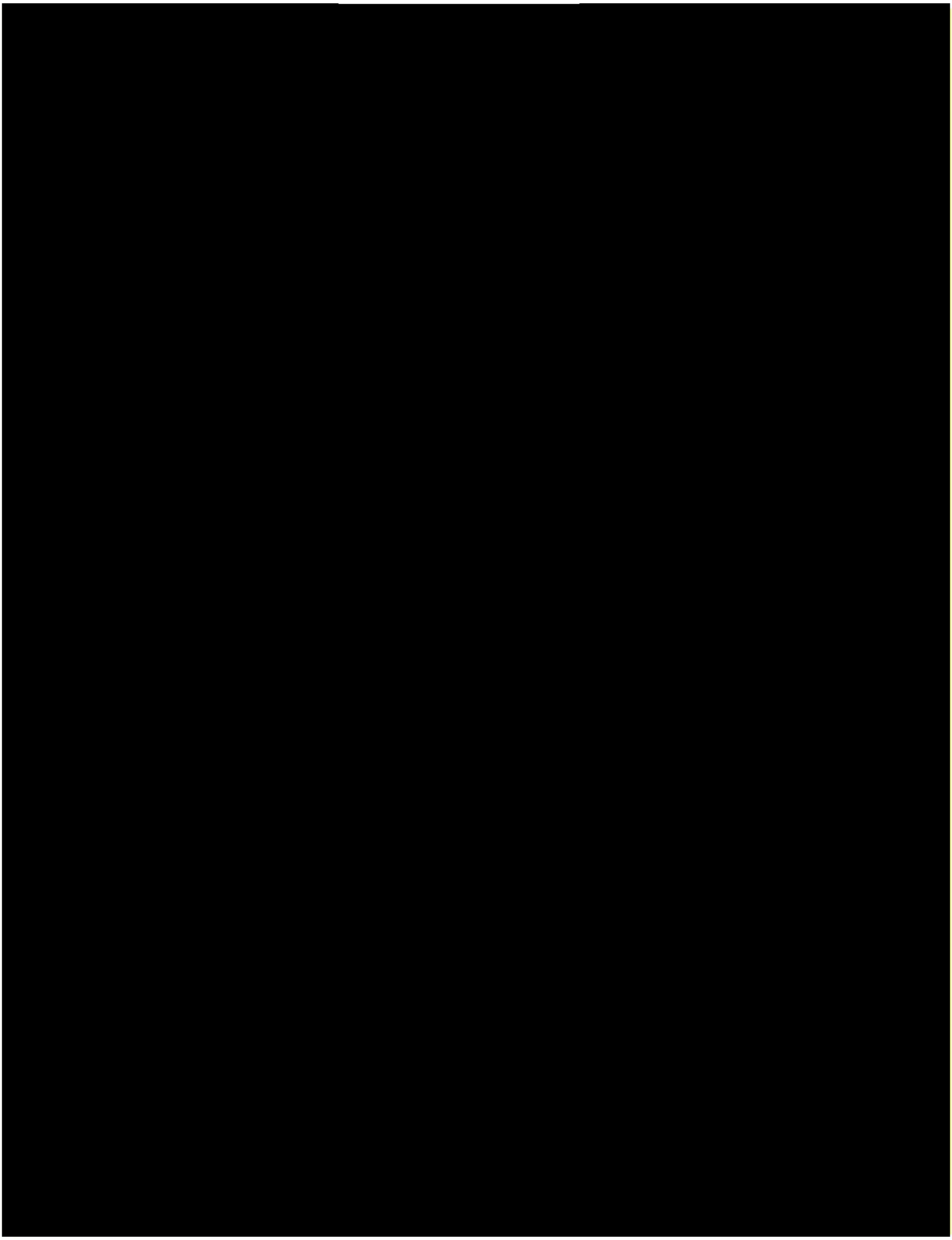

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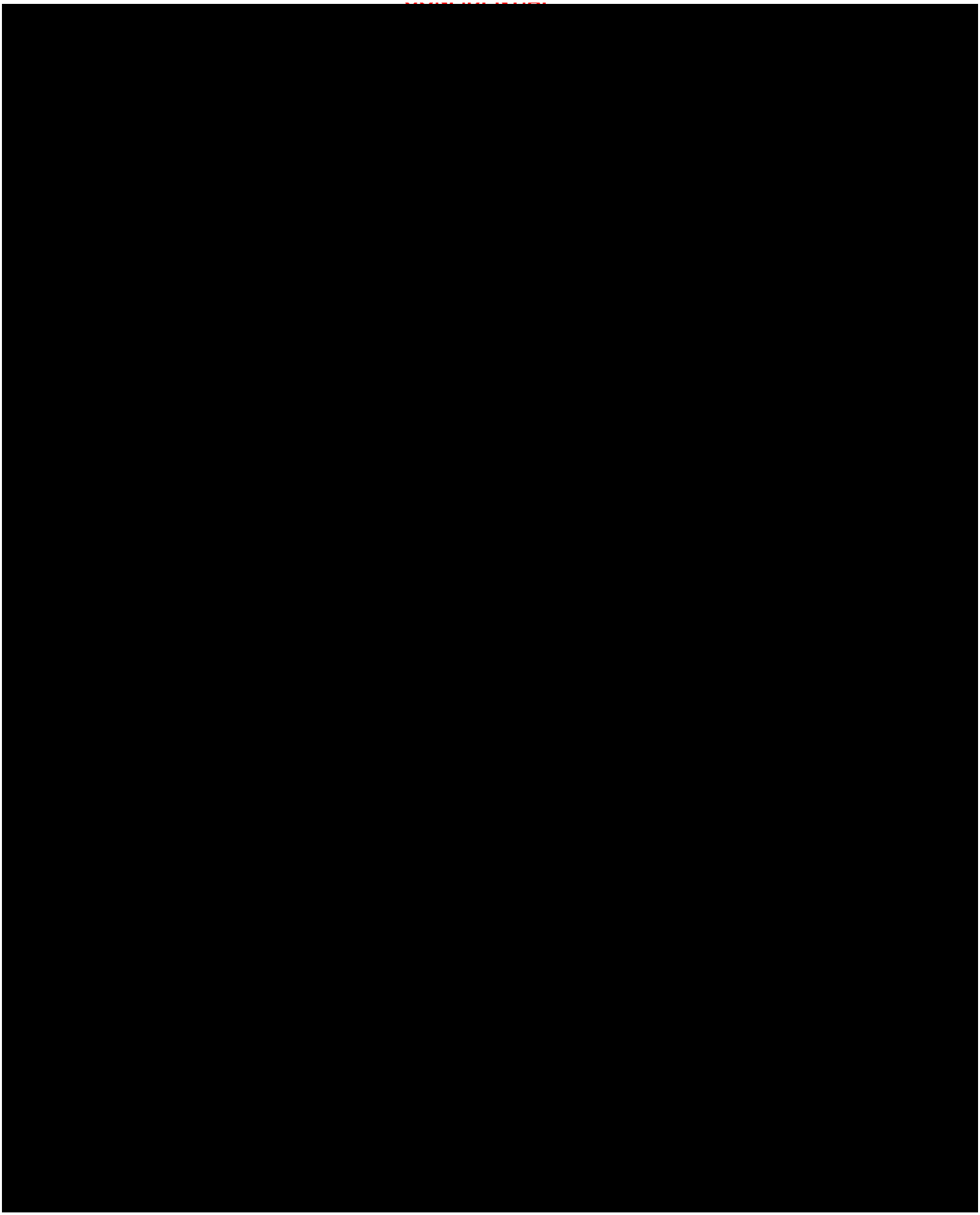

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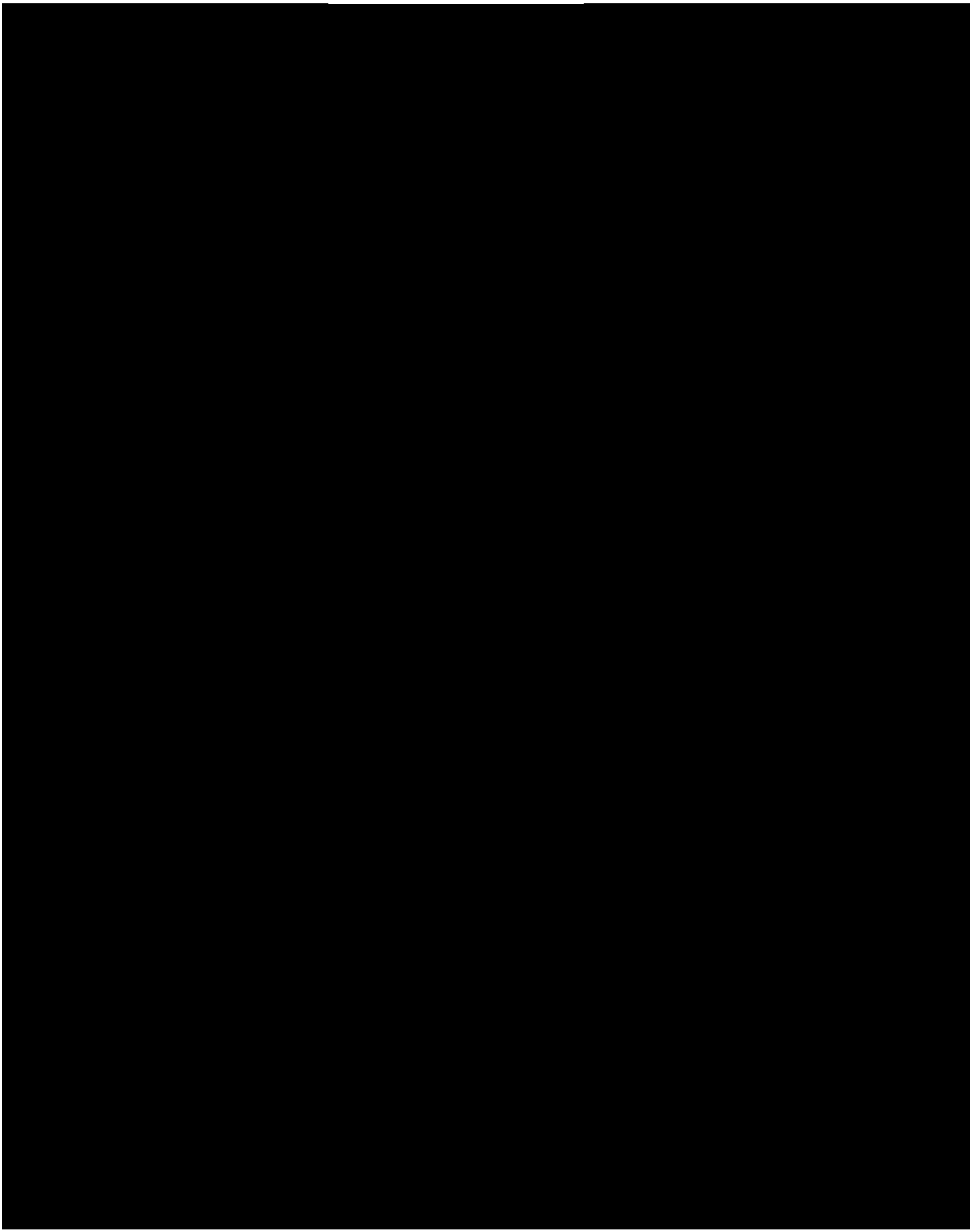

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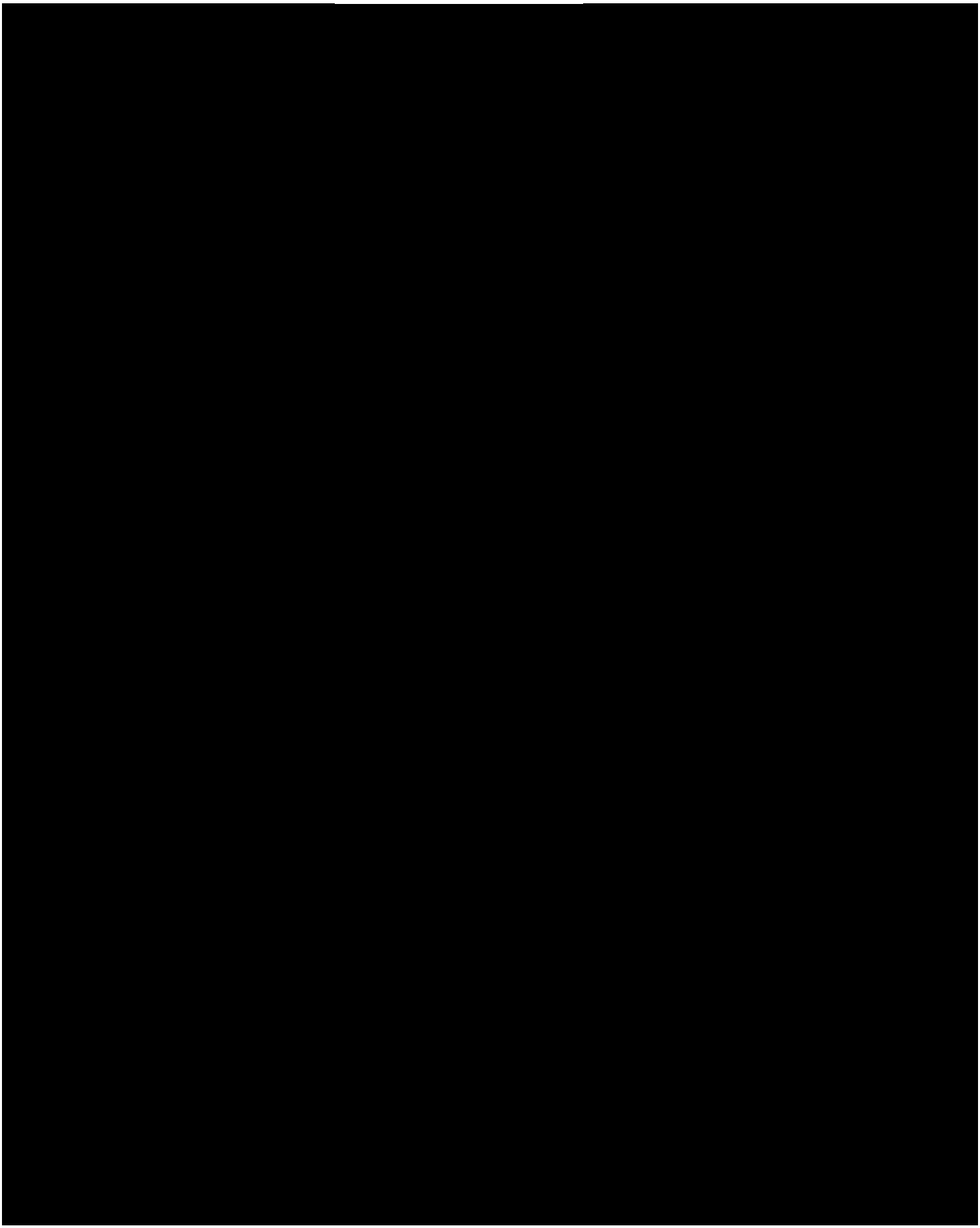

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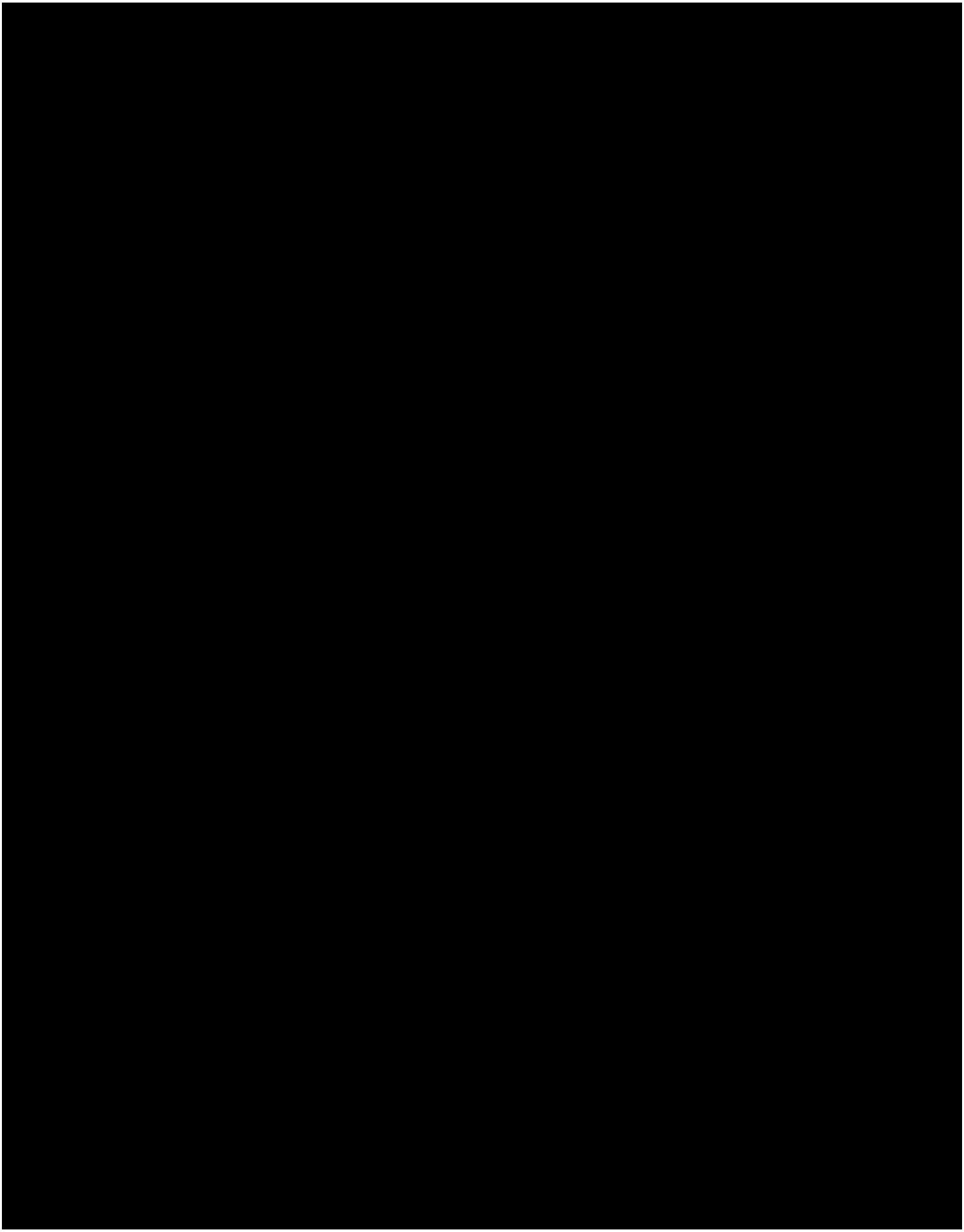

33

Updated Site-Specific Decommissioning Cost Estimate for the Crystal River Unit 3 Nuclear Generating Plant, filed on September 10, 2018.

DN. 05915-2018

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 33
PARTY: STAFF HEARING EXHIBITS
DESCRIPTION: Terry Hobbs

FILED 9/10/2018
DOCUMENT NO. 05915-2018
FPSC - COMMISSION CLERK

DUKE ENERGY FLORIDA

Dianne M. Triplett
DEPUTY GENERAL COUNSEL

September 10, 2018

VIA ELECTRONIC FILING

Ms. Carlotta Stauffer, Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Re: Duke Energy Florida, LLC Updated Nuclear Decommissioning Cost Study re. Crystal River Unit 3; *Undocketed*

Dear Ms. Stauffer:

Pursuant to and in compliance with Rule 25-6.04365, F.A.C., please find attached for filing on behalf of Duke Energy Florida, LLC, ("DEF"), its Updated Site-Specific Decommissioning Cost Estimate for the Crystal River Unit 3 Nuclear Generating Plant, along with a revenue requirement calculation. This study is for informational purposes; therefore, DEF is not requesting the Commission take any action on this study.

Thank you for your assistance in this matter. If you have any questions, please feel free to contact me at (727) 820-4692.

Sincerely,

/s/ Dianne M. Triplett

Dianne M. Triplett

DMT/cmk
Attachments

299 First Avenue N (33701) • Post Office Box 14042 (33733) • St. Petersburg, Florida
Phone: 727.820.4692 • Fax: 727.820.5041 • Email: dianne.triplett@duke-energy.com

UPDATED SITE-SPECIFIC DECOMMISSIONING COST ESTIMATE

for the

CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT

prepared for

Duke Energy Florida LLC

prepared by

TLG Services, Inc.
Bridgewater, Connecticut

May 2018

APPROVALS

Project Manager	William A. Cloutier, Jr.	01 May 2018 Date
Project Engineer	John A. Carlson	5/1/18 Date
Project Engineer	Leasa Goetchius	5/1/2018 Date
Technical Manager	Francis W. Seymore	5/1/18 Date

20190140.EI Staff Hearing Exhibits 00177

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20190140.EI Staff Hearing Exhibits 00178

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REVISION LOG

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SUMMARY

This report presents an estimate of the cost to decommission the Crystal River Unit 3 Nuclear Generating Plant (CR-3). The analysis relies upon site-specific, technical information from an earlier evaluation prepared in 2013,[1] updated to reflect current assumptions pertaining to the disposition of the nuclear unit and relevant industry experience in undertaking such projects. This estimate has been prepared for Duke Energy Florida LLC (DEF), formerly known as Florida Power Corporation, consistent with the recommendations for periodic review and/or adjustment provided in Regulatory Guide 1.159.[2]

The current estimate is designed to provide DEF with sufficient information to assess its financial obligations, as they pertain to the decommissioning of the nuclear station. It is not a detailed engineering document, but a financial analysis prepared in advance of the detailed engineering that will be required to carry out the decommissioning.

CR-3 has been safely shutdown since September 26, 2009, when the plant entered the Cycle 16 refueling outage to replace the steam generators. As of May 28, 2011, all fuel assemblies were removed from the reactor vessel and placed in the spent fuel storage pool in the fuel storage building for temporary storage. Certification of the permanent cessation of power operations and defueling was submitted to the Nuclear Regulatory Commission (NRC) on February 20, 2013.[3] Transfer of the irradiated fuel assemblies from the spent fuel storage pool to an on-site, dry storage facility was completed in January 2018.

DEF has announced its intention to decommission under the SAFSTOR alternative. The currently projected total cost to decommission the nuclear unit, assuming the SAFSTOR alternative, is estimated at $895.9 million, as reported in 2017 dollars. The cost includes the monies anticipated to be spent for operating license termination (radiological remediation), interim spent fuel storage and site restoration activities. The cost is based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency) and

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1 "Site-Specific Decommissioning Cost Estimate for the Crystal River Unit 3 Nuclear Generating Plant," Document No. P23-1680-001, Rev. 1, TLG Services, Inc., December 2013

2 "U.S. Nuclear Regulatory Commission, Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," Rev. 2, October 2011, Section 1.4.3 "Frequency of Adjustment"

3 FPC to NRC letter dated February 20, 2013, "Crystal River Unit 3 - Certificate of Permanent Cessation of Power Operations and that Fuel Has Been Permanently Removed from the Reactor" (ADAMS Accession No. ML13056A005)

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site remediation and restoration requirements. The assumptions are discussed in more detail in this document.

Decommissioning Alternatives and Regulations

The ultimate objective of the decommissioning process is to reduce the inventory of contaminated and activated material to levels at or below the site release criteria so that the license can be terminated. The NRC (or Commission) provided initial decommissioning requirements in its rule adopted on June 27, 1988.[4] In this rule, the NRC set forth financial criteria for decommissioning licensed nuclear power facilities. The regulations addressed planning needs, timing, funding methods, and environmental review requirements for decommissioning. The decommissioning rulemaking also defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB.

> DECON is defined as "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations."[5]
>
> SAFSTOR is defined as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use."[6] Decommissioning is to be completed within 60 years, although longer time periods will be considered when necessary to protect public health and safety.
>
> ENTOMB is defined as "the alternative in which radioactive contaminants are encased in a structurally long-lived material, such as concrete; the entombed structure is appropriately maintained and continued surveillance is carried out until the radioactive material decays to a level permitting unrestricted release of the property."[7] As with the SAFSTOR alternative, decommissioning is currently required to be completed within 60 years, although longer time periods will also be considered when necessary to protect public health and safety.

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4 U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70 and 72 "General Requirements for Decommissioning Nuclear Facilities," Nuclear Regulatory Commission, Federal Register Volume 53, Number 123 (p 24018 et seq.), June 27, 1988

5 Ibid. Page FR24022, Column 3

6 Ibid.

7 Ibid. Page FR24023, Column 2

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> The 60-year restriction has limited the practicality for the ENTOMB alternative at commercial reactors that generate significant amounts of long-lived radioactive material. In 1997, the Commission directed its staff to re-evaluate this alternative and identify the technical requirements and regulatory actions that would be necessary for entombment to become a viable option. The resulting evaluation provided several recommendations, however, rulemaking has been deferred pending the completion of additional research studies (e.g., on engineered barriers).
>
> In a draft regulatory basis document published in March 2017 in support of rulemaking that would amend NRC regulations concerning nuclear plant decommissioning, the NRC staff proposed removing any discussion of the ENTOMB option from existing guidance documents since the method is not deemed practically feasible.

In 1996, the NRC published revisions to the general requirements for decommissioning nuclear power plants to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process.[8] The amendments allow for greater public participation and better define the transition process from operations to decommissioning. Regulatory Guide 1.184, issued in July 2000, further described the methods and procedures acceptable to the NRC staff for implementing the requirements of the 1996 revised rule relating to the initial activities and major phases of the decommissioning process. The costs and schedules presented in this analysis follow the general guidance and processes described in the amended regulations. The format and content of the estimate is also consistent with the recommendations of Regulatory Guide 1.202, issued in February 2005.[9]

In 2011, the NRC issued regulations to improve decommissioning planning and thereby reduce the likelihood that any current operating facility will become a legacy site.[10] The regulations require licensees to report additional details in their decommissioning cost estimate, including a decommissioning estimate for the Independent Spent Fuel Storage Installation (ISFSI). This estimate is provided in Appendix D.

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8 U.S. Code of Federal Regulations, Title 10, Parts 2, 50, and 51, "Decommissioning of Nuclear Power Reactors," Nuclear Regulatory Commission, Federal Register Volume 61, (p 39278 et seq.), July 29, 1996

9 "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," Regulatory Guide 1.202, U.S. Nuclear Regulatory Commission, February 2005

10 U.S. Code of Federal Regulations, Title 10, Parts 20, 30, 40, 50, 70, and 72, "Decommissioning Planning," Nuclear Regulatory Commission, Federal Register Volume 76, (p 35512 et seq.), June 17, 2011

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Basis of the Cost Estimate

The decommissioning approach that has been selected by DEF for CR-3 is the SAFSTOR alternative. The primary objectives of the CR-3 decommissioning project are to safeguard the irradiated fuel until it can be transferred to the Department of Energy (DOE), reduce residual radioactivity to levels permitting unrestricted release, restore the site, perform this work safely, and complete the work in a cost effective manner. The selection of a preferred decommissioning alternative is influenced by a number of factors. These factors include the cost of each decommissioning alternative, minimization of occupational radiation exposure, availability of low-level waste disposal facilities, availability of a high-level waste (spent fuel) repository or DOE interim storage facility, regulatory requirements, and public concerns.

Under the SAFSTOR methodology, the facility is placed in a safe and stable condition and maintained in that state, allowing levels of radioactivity to decrease through radioactive decay, followed by decontamination and dismantlement. After the safe storage period, the facility will be decontaminated and dismantled to levels that permit license termination. In accordance with 10 CFR 50.82(a)(9), a license termination plan (LTP) will be developed and submitted for NRC approval at least two years prior to termination of the license. In addition, 10 CFR 50.82(a)(3) requires decommissioning to be completed within 60 years of permanent cessation of operations.

An ISFSI has been constructed adjacent to the power block and the spent fuel relocated from the auxiliary building into the dry storage modules to await transfer to a DOE facility. Assuming priority pickup for the spent fuel from shutdown reactors, and based upon a 2034 industry start date, DEF anticipates that the removal of spent fuel from the site could be completed by the end of year 2037.

For purposes of this analysis, the plant remains in safe-storage until 2067, at which time it will be decommissioned and the site released for alternative use without restriction, i.e., the license is terminated within the required 60-year time period.

Methodology

The primary goal of the decommissioning is the removal and disposal of the contaminated systems and structures so that the plant's operating license can be terminated. The analysis recognizes that spent fuel will be stored at the site until such time that it can be transferred to the DOE. Consequently, the estimate includes those costs to manage and subsequently decommission the interim storage facility (ISFSI).

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The estimate is based on numerous fundamental assumptions, including regulatory requirements, low-level radioactive waste disposal practices, high-level radioactive waste management options, project contingencies, and site restoration requirements.

The methodology used to develop the estimate followed the basic approach originally presented in the AIF/NESP-036 study report, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates,"[11] and the DOE "Decommissioning Handbook."[12] These documents present a unit cost factor method for estimating decommissioning activity costs that simplifies the calculations. Unit factors for concrete removal ($/cubic yard), steel removal ($/ton), and cutting costs ($/inch) were developed using local labor rates. The activity-dependent costs were then estimated with the item quantities (cubic yards and tons), developed from plant drawings and inventory documents. Removal rates and material costs for the conventional disposition of components and structures relied upon information available in the industry publication, "Building Construction Cost Data," published by RSMeans.[13]

The unit factor method provides a demonstrable basis for establishing reliable cost estimates. The detail provided in the unit factors, including activity duration, labor costs (by craft), and equipment and consumable costs, ensures that essential elements have not been omitted.

An activity duration critical path is used to determine the total decommissioning program schedule. The schedule is relied upon in calculating the carrying costs, which include program management, administration, field engineering, equipment rental, and support services, such as quality control and security.

This analysis reflected lessons learned from TLG's involvement in the Shippingport Station decommissioning, completed in 1989, as well as the decommissioning of the Cintichem reactor, hot cells, and associated facilities, completed in 1997. In addition, the planning and engineering for the Pathfinder, Shoreham, Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Connecticut Yankee, Vermont Yankee and Fort Calhoun nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

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11 T.S. LaGuardia et al., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986

12 W.J. Manion and T.S. LaGuardia, "Decommissioning Handbook," U.S. Department of Energy, DOE/EV/10128-1, November 1980

13 "Building Construction Cost Data 2017," RSMeans (From the Gordian Group), Rockland, Massachusetts

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Contingency

Consistent with cost estimating practice, contingencies are applied to the decontamination and dismantling costs developed as "specific provision for unforeseeable elements of cost within the defined project scope, particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur."[14] The cost elements in the estimate are based on ideal conditions; therefore, the types of unforeseeable events that are almost certain to occur in decommissioning, based on industry experience, are addressed through a percentage contingency applied on a line-item basis. This contingency factor is a nearly universal element in all large-scale construction and demolition projects. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the life of the project.

Contingency funds are expected to be fully expended throughout the program. As such, inclusion of contingency is necessary to provide assurance that sufficient funding will be available to accomplish the intended tasks.

Low-Level Radioactive Waste Disposal

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is generally classified as low-level radioactive waste, although not all of the material is suitable for shallow-land disposal. With the passage of the "Low-Level Radioactive Waste Disposal Act" in 1980 and its Amendments of 1985, [15] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

With the exception of Texas, no new compact facilities have been successfully sited, licensed, and constructed. The Texas Compact disposal facility is now operational and waste is being accepted from generators within the Compact by the operator, Waste Control Specialists (WCS). The facility is also able to accept limited volumes of non-Compact waste.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to DEF. The majority of the low-level radioactive waste designated for direct disposal (Class A[16]) can be sent to

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14 Project and Cost Engineers' Handbook, Second Edition, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, p. 239

15 "Low-Level Radioactive Waste Policy Amendments Act of 1985," Public Law 99-240, January 15, 1986

16 Waste is classified in accordance with U.S. Code of Federal Regulations, Title 10, Part 61.55,

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Energy*Solutions*' facility in Clive, Utah. Therefore, disposal costs for Class A waste were based upon DEF's *Life of Plant Agreement* with Energy*Solutions*. This facility is not licensed to receive higher activity waste (Class B and C).

The WCS facility is able to receive the Class B and C waste. As such, for this analysis, Class B and C waste is assumed to be shipped to the WCS facility and disposal costs for the waste were based upon preliminary and indicative information on the cost for such from WCS.

The dismantling of the components residing closest to the reactor core generates radioactive waste that may be considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance.

For purposes of this study, components that must be disposed of as GTCC waste would be packaged in transportable canisters similar to canisters used for spent fuel. Because dismantlement would occur after the projected date for DOE acceptance of spent fuel and high level waste, for purposes of this study it is assumed that the canisters would be shipped directly to a DOE facility.

A significant portion of the waste material generated during decommissioning may only be potentially contaminated by radioactive materials. This waste can be analyzed on site or shipped off site to licensed facilities for further analysis, for processing and/or for conditioning/recovery. Reduction in the volume of low-level radioactive waste requiring disposal in a licensed low-level radioactive waste disposal facility can be accomplished through a variety of methods, including analyses and surveys or decontamination to eliminate the portion of waste that does not require disposal as radioactive waste, compaction, incineration or metal melt. The estimate reflects the savings from waste recovery/volume reduction.

<u>High-Level Radioactive Waste Management</u>

Congress passed the "Nuclear Waste Policy Act" (NWPA) in 1982, assigning the federal government's long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. The DOE was

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"Licensing Requirements for Land Disposal of Radioactive Waste"

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to begin accepting spent fuel and high-level waste by January 31, 1998; however, to date no progress in the removal of spent fuel from commercial generating sites has been made.

Today, the country is at an impasse on high-level waste disposal, despite DOE's submittal of its License Application for a geologic repository to the NRC in 2008. The Obama administration eliminated the budget for the repository program while promising to "conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle … and make recommendations for a new plan."[17] Towards this goal, the Obama administration appointed a Blue Ribbon Commission on America's Nuclear Future (Blue Ribbon Commission) to make recommendations for a new plan for nuclear waste disposal. The Blue Ribbon Commission's charter included a requirement that it consider "[o]ptions for safe storage of used nuclear fuel while final disposition pathways are selected and deployed." [18]

On January 26, 2012, the Blue Ribbon Commission issued its "Report to the Secretary of Energy" containing a number of recommendations on nuclear waste disposal. Two of the recommendations that may impact decommissioning planning are:

- "[T]he United States [should] establish a program that leads to the timely development of one or more consolidated storage facilities"[19]
- "[T]he United States should undertake an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geological facilities for the safe disposal of spent fuel and high-level nuclear waste."[20]

In January 2013, the DOE issued the "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," in response to the recommendations made by the Blue Ribbon Commission and as "a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel..."[21]

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17 "Advisory Committee Charter, Blue Ribbon Commission on America's Nuclear Future," Appendix A, January 2012

18 Ibid.

19 "Blue Ribbon Commission on America's Nuclear Future, Report to the Secretary of Energy," January 2012

20 Ibid., p.27

21 "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," U.S. DOE, January 11, 2013

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"With the appropriate authorizations from Congress, a program could be implemented over the next 10 years that:

- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048."[22]

The NRC's review of DOE's license application to construct a geologic repository at Yucca Mountain was suspended in 2011 when the Obama Administration significantly reduced the budget for completing that work. However, the US Court of Appeals for the District of Columbia Circuit issued a writ of mandamus (in August 2013)[23] ordering NRC to comply with federal law and resume its review of DOE's Yucca Mountain repository license application to the extent allowed by previously appropriated funding for the review. That review is now complete with the publication of the five-volume safety evaluation report. A supplement to DOE's environmental impact statement and an adjudicatory hearing on the contentions filed by interested parties must be completed before a licensing decision can be made.

Even with a favorable review, there is considerable uncertainty as to DOE's future actions on the growing backlog of spent fuel, even with the additional direction provided by the Blue Ribbon Commission. For purposes of this analysis, DEF evaluated the feasibility of several spent fuel disposition scenarios, both near-term (e.g., 2021) and long-term (e.g., 2048), as well as a more moderate scenario.

For purposes of this estimate, the spent fuel management plan for the CR-3 spent fuel is based in general upon: 1) a 2034 start date for DOE initiating transfer of commercial spent fuel to a federal facility, 2) priority pickup for shutdown reactors, and 3) pickup based on the permanent shutdown date of the plant (oldest fuel first). Assuming a maximum rate of transfer of 3,000 metric tons of uranium (MTU)/year, [24]

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22 Ibid., p.2

23 U.S. Court of Appeals for the District Of Columbia Circuit, In Re: Aiken County, et al, Aug. 2013

24 "Acceptance Priority Ranking & Annual Capacity Report," DOE/RW-0567, July 2004

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and the aforementioned assumptions on spent fuel management, transfer of spent fuel from commercial generators would begin in 2034, with the spent fuel from CR-3 removed from the site by the end of 2037.

The NRC requires that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor site until title of the fuel is transferred to the DOE.[25] Interim storage of the fuel, until the DOE can complete the transfer, will be at the on-site ISFSI.

DEF's position is that the DOE has a contractual obligation to accept the spent fuel earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim.

Site Restoration

The efficient removal of the contaminated materials at the site may result in damage to many of the site structures. Blasting, coring, drilling, and the other decontamination activities can substantially damage power block structures, potentially weakening the footings and structural supports. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. Dismantling site structures with a work force already mobilized is more efficient and less costly than if the process is deferred. Consequently, this study assumes that site structures addressed by this analysis are removed to a nominal depth of three feet below the top grade of the embankment, wherever possible.

The cost for the site restoration of decontaminated and/or non-contaminated structures has been calculated and is separately presented as "Site Restoration" expenditures in this report.

Summary

The cost to decommission CR-3 assumes the removal of all contaminated and activated plant components and structural materials such that DEF may then have unrestricted use of the site with no further requirements for an operating license. Low-level radioactive waste, other than GTCC waste, is sent to a commercial processor for treatment/conditioning or to a controlled disposal facility.

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25 U.S. Code of Federal Regulations, Title 10, Part 50 – Domestic Licensing of Production and Utilization Facilities, Subpart 54 (bb), "Conditions of Licenses"

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Decommissioning is accomplished within the 60-year period required by current NRC regulations. In the interim, the spent fuel remains in storage at the site until such time that the transfer to a DOE facility is complete. Once emptied, the storage facilities are also decommissioned.

The decommissioning scenario is described in Section 2. The assumptions are presented in Section 3, along with schedules of annual expenditures. The major cost contributors are identified in Section 6, with detailed activity costs, waste volumes, and associated manpower requirements delineated in Appendix C.

The cost elements in the estimate are assigned to one of three subcategories: NRC License Termination, Spent Fuel Management, and Site Restoration. The subcategory "NRC License Termination" is used to accumulate costs that are consistent with "decommissioning" as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). In situations where the long-term management of spent fuel is not an issue, the cost reported for this subcategory is generally sufficient to terminate the unit's operating license.

The "Spent Fuel Management" subcategory contains costs associated with the operations of the ISFSI until such time that the transfer is complete. It does not include any spent fuel management expenses incurred prior to January 1, 2018, including the cost to construct the ISFSI and transfer the spent fuel from the storage pool. For estimating purposes, an allowance is included for the transfer of the fuel from the ISFSI into a DOE transport cask.

"Site Restoration" is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels.

It should be noted that the costs assigned to these subcategories are allocations. Delegation of cost elements is for the purposes of comparison (e.g., with NRC financial guidelines) or to permit specific financial treatment (e.g., Asset Retirement Obligation determinations). In reality, there can be considerable interaction between the activities in the three subcategories. For example, DEF may decide to remove non-contaminated structures early in the project to improve access to highly contaminated facilities or plant components. In these instances, the non-contaminated removal costs could be reassigned from Site Restoration to an NRC License Termination support activity. However, in general, the allocations represent a reasonable accounting of those costs that can be expected to be incurred for the specific subcomponents of the total estimated program cost, if executed as described.

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As noted within this document, the estimate is developed and costs are presented in 2017 dollars. As such, the estimate does not reflect the escalation of costs (due to inflationary and market forces) during the decommissioning project. The decommissioning periods and milestone dates for the analyzed SAFSTOR decommissioning scenario are identified in Table 1. The cost projected for license termination (in accordance with 10 CFR 50.75) is shown at the bottom of Table 2 along with the costs for spent fuel management and site restoration. The schedule of expenditures for license termination activities is provided in Table 3.

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TABLE 1
DECOMMISSIONING SCHEDULE

Decommissioning Periods	Start	End	Duration (years)
SAFSTOR I [1]	1 Jan 2018	31 Aug 2019	1.66
SAFSTOR II	31 Aug 2019	1 Jan 2020	0.34
Period 2b: Dormancy w/Dry Fuel Storage	1 Jan 2020	1 Jan 2038	18.01
Period 2c: Dormancy w/No Fuel Storage	1 Jan 2038	23 May 2067	29.41
Period 3a: Site Reactivation	23 May 2067	22 May 2068	1.00
Period 3b: Decommissioning Prep	22 May 2068	21 Nov 2068	0.50
Period 4a: Large Component Removal	21 Nov 2068	26 Jun 2070	1.59
Period 4b: Plant Systems Removal and Building Remediation	26 Jun 2070	22 May 2072	1.91
Period 4f: License Termination	22 May 2072	20 Feb 2073	0.75
Period 5b: Site Restoration	20 Feb 2073	22 Aug 2074	1.50
Total [2]			56.68

[1] While permanent cessation of operations was declared on February 20, 2013, decommissioning costs are accumulated as of January 1, 2018

[2] Columns may not add due to rounding

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TABLE 2
DECOMMISSIONING COST SUMMARY
(thousands of 2017 dollars)

Decommissioning Periods	License Termination	Spent Fuel Management	Site Restoration
SAFSTOR I [1]	27,258	33,216	388
SAFSTOR II	861	3,097	46
Period 2b: Dormancy w/Dry Fuel Storage	132,896	58,748	-
Period 2c: Dormancy w/No Fuel Storage	115,898	82	-
Period 3a: Site Reactivation	39,789	-	699
Period 3b: Decommissioning Prep	35,247	-	917
Period 4a: Large Component Removal	203,367	-	2,552
Period 4b: Plant Systems Removal and Building Remediation	165,021	-	1,615
Period 4f: License Termination	28,278	-	-
Period 5b: Site Restoration	229	-	45,690
Total [2]	748,844	95,143	51,906

[1] Excludes costs expended prior to 2018
[2] Columns may not add due to rounding

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TABLE 3
SCHEDULE OF LICENSE TERMINATION EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Total
2018	7,620	342	0	1,258	11,142	20,362
2019	5,078	184	0	363	2,132	7,757
2020	5,648	138	0	8	1,604	7,398
2021	5,633	138	0	8	1,600	7,377
2022	5,633	138	0	8	1,600	7,377
2023	5,633	138	0	8	1,600	7,377
2024	5,648	138	0	8	1,604	7,398
2025	5,633	138	0	8	1,600	7,377
2026	5,633	138	0	8	1,600	7,377
2027	5,633	138	0	8	1,600	7,377
2028	5,648	138	0	8	1,604	7,398
2029	5,633	138	0	8	1,600	7,377
2030	5,633	138	0	8	1,600	7,377
2031	5,633	138	0	8	1,600	7,377
2032	5,648	138	0	8	1,604	7,398
2033	5,633	138	0	8	1,600	7,377
2034	5,633	138	0	8	1,600	7,377
2035	5,633	138	0	8	1,600	7,377
2036	5,648	138	0	8	1,604	7,398
2037	5,633	138	0	8	1,600	7,377
2038	2,102	120	0	7	1,713	3,941
2039	2,102	120	0	7	1,713	3,941
2040	2,107	121	0	7	1,717	3,952
2041	2,102	120	0	7	1,713	3,941
2042	2,102	120	0	7	1,713	3,941
2043	2,102	120	0	7	1,713	3,941
2044	2,107	121	0	7	1,717	3,952
2045	2,102	120	0	7	1,713	3,941
2046	2,102	120	0	7	1,713	3,941
2047	2,102	120	0	7	1,713	3,941
2048	2,107	121	0	7	1,717	3,952
2049	2,102	120	0	7	1,713	3,941
2050	2,102	120	0	7	1,713	3,941

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TABLE 3 (continued)
SCHEDULE OF LICENSE TERMINATION EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Total
2051	2,102	120	0	7	1,713	3,941
2052	2,107	121	0	7	1,717	3,952
2053	2,102	120	0	7	1,713	3,941
2054	2,102	120	0	7	1,713	3,941
2055	2,102	120	0	7	1,713	3,941
2056	2,107	121	0	7	1,717	3,952
2057	2,102	120	0	7	1,713	3,941
2058	2,102	120	0	7	1,713	3,941
2059	2,102	120	0	7	1,713	3,941
2060	2,107	121	0	7	1,717	3,952
2061	2,102	120	0	7	1,713	3,941
2062	2,102	120	0	7	1,713	3,941
2063	2,102	120	0	7	1,713	3,941
2064	2,107	121	0	7	1,717	3,952
2065	2,102	120	0	7	1,713	3,941
2066	2,102	120	0	7	1,713	3,941
2067	22,037	1,183	730	23	1,869	25,843
2068	46,226	10,005	1,191	3,988	3,643	65,053
2069	50,292	25,681	1,135	35,217	15,216	127,541
2070	48,474	18,325	1,011	25,680	12,820	106,311
2071	46,782	11,475	896	16,800	10,589	86,541
2072	38,116	5,503	495	6,554	6,117	56,786
2073	4,577	232	33	4	446	5,292
2074	97	0	0	0	0	97
Total	431,747	78,901	5,491	90,218	142,486	748,844

Note: Columns may not add due to rounding

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1. INTRODUCTION

This report presents an estimate of the cost to decommission the Crystal River Unit 3 Nuclear Generating Plant (CR-3). The analysis relies upon site-specific, technical information from an earlier evaluation prepared in 2013,[1] updated to reflect current assumptions pertaining to the disposition of the nuclear unit and relevant industry experience in undertaking such projects. This estimate has been prepared for Duke Energy Florida LLC (DEF), formerly known as Florida Power Corporation, to comply with the requirements of 10 CFR 50.82(a)(4)(i).

The current estimate is designed to provide DEF with sufficient information to assess its financial obligations, as they pertain to the decommissioning of the nuclear station. It is not a detailed engineering document, but a financial analysis prepared in advance of the detailed engineering that will be required to carry out the decommissioning.

1.1 OBJECTIVES OF STUDY

The objectives of this study were to prepare a comprehensive estimate of the costs to decommission CR-3, to provide a sequence or schedule for the associated activities, and to develop waste stream projections from the decontamination and dismantling activities.

CR-3 has been safely shutdown since September 26, 2009, when the plant entered the Cycle 16 refueling outage to replace the steam generators. As of May 28, 2011, all fuel assemblies were removed from the reactor vessel and placed in the spent fuel pool for temporary storage. Certification of the permanent cessation of power operations and defueling was submitted to the NRC on February 20, 2013.[2]

DEF has announced its intention to decommission under the SAFSTOR alternative.

1.2 SITE DESCRIPTION

The CR-3 site is located in Citrus County, Florida, approximately 70 miles north of Tampa on the shore of the Gulf of Mexico. The generating site is comprised of four fossil-fired units and one nuclear unit. The Gulf of Mexico provides the heat sink for both Units 1 and 2 fossil-fired units, and the nuclear unit (natural draft towers provide the cooling for Units 4 and 5).

The nuclear steam supply system (NSSS) consists of a pressurized water reactor and a two-loop reactor coolant system, designed by Babcock & Wilcox.

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The generating unit had a reference core design of 2,609 MWt (thermal), with a corresponding net dependable capability electrical rating of 860 megawatts (electric) with the reactor at rated power.

The reactor coolant system is comprised of the reactor vessel and two heat transfer loops, each loop containing a vertical once-through type steam generator, and two single speed centrifugal reactor coolant pumps. In addition, the system includes an electrically heated pressurizer, a reactor coolant drain tank and interconnected piping. The system is housed within the reactor containment building or reactor building, a seismic Category I reinforced concrete structure. The reactor building is composed of a vertical cylinder with a shallow dome and flat circular foundation slab. The cylinder wall is prestressed with a post-tensioning system in the vertical and horizontal directions. The dome roof is prestressed utilizing a three-way post-tensioning system. The foundation slab is reinforced with conventional mild steel. The inside surface of the reactor building is lined with a carbon steel liner to ensure a high degree of leak tightness during operating and accident conditions.

Heat produced in the reactor was converted to electrical energy by the steam and power conversion system. A turbine-generator system converted the thermal energy of steam produced in the steam generators into mechanical shaft power and then into electrical energy. The unit's turbine generator consists of high-pressure and low-pressure turbine sections driving a direct-coupled generator at 1800 rpm. The turbines were operated in a closed feedwater cycle, which condensed the steam; the heated feedwater was returned to the steam generators. Heat rejected in the main condensers was removed by the circulating water system. The condenser circulating water was taken from and returned to the Gulf of Mexico through the intake and discharge canals, respectively.

1.3 REGULATORY GUIDANCE

The NRC provided initial decommissioning requirements in its rule "General Requirements for Decommissioning Nuclear Facilities," issued in June 1988.[3] This rule set forth financial criteria for decommissioning licensed nuclear power facilities. The regulation addressed decommissioning planning needs, timing, funding methods, and environmental review requirements. The intent of the rule was to ensure that decommissioning would be accomplished in a safe and timely manner and that adequate funds would be available for this purpose. Subsequent to the rule, the NRC issued Regulatory Guide 1.159, “Assuring the Availability of Funds for Decommissioning Nuclear Reactors,”[4] which provided additional guidance to the licensees of nuclear facilities on the financial methods acceptable to the NRC staff for complying with the

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requirements of the rule. The regulatory guide addressed the funding requirements and provided guidance on the content and form of the financial assurance mechanisms indicated in the rule.

The decommissioning rulemaking defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB. The DECON alternative assumes that any contaminated or activated portion of the plant's systems, structures and facilities are removed or decontaminated to levels that permit the site to be released for unrestricted use shortly after the cessation of plant operations. The rule also placed limits on the time allowed to complete the decommissioning process.

For SAFSTOR, the process is restricted in overall duration to 60 years, unless it can be shown that a longer duration is necessary to protect public health and safety. The guidelines for ENTOMB are similar, providing the NRC with both sufficient leverage and flexibility to ensure that these deferred options are only used in situations where it is reasonable and consistent with the definition of decommissioning. At the conclusion of a 60-year dormancy period (or longer for ENTOMB if the NRC approves such a case), the site would still require significant remediation to meet the unrestricted release limits for license termination.

The ENTOMB alternative has not been viewed as a viable option for power reactors due to the significant time required to isolate the long-lived radionuclides for decay to permissible levels. With rulemaking permitting the controlled release of a site,[5] the NRC has re-evaluated this alternative. The resulting feasibility study, based upon an assessment by Pacific Northwest National Laboratory, concluded that the method did have conditional merit for some, if not most reactors. The staff also found that additional rulemaking would be needed before this option could be treated as a generic alternative.

The NRC had considered rulemaking to alter the 60-year time for completing decommissioning and to clarify the use of engineered barriers for reactor entombments.[6] However, the NRC's staff has recommended that rulemaking be deferred, based upon several factors, e.g., no licensee has committed to pursuing the entombment option, the unresolved issues associated with the disposition of greater-than-Class C material (GTCC), and the NRC's current priorities, at least until after the additional research studies are complete. The Commission concurred with the staff's recommendation.

In a draft regulatory basis document published in March 2017 in support of rulemaking that would amend NRC regulations concerning nuclear plant decommissioning, the NRC staff proposes removing any discussion of the

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ENTOMB option from existing guidance documents since the method is not deemed practically feasible.

In 1996, the NRC published revisions to the general requirements for decommissioning nuclear power plants.[7] When the decommissioning regulations were adopted in 1988, it was assumed that the majority of licensees would decommission at the end of the facility's operating licensed life. Since that time, several licensees permanently and prematurely ceased operations. Exemptions from certain operating requirements were required once the reactor was defueled to facilitate the decommissioning. Each case was handled individually, without clearly defined generic requirements. The NRC amended the decommissioning regulations in 1996 to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process. The amendments allow for greater public participation and better define the transition process from operations to decommissioning.

Under the revised regulations, licensees will submit written certification to the NRC within 30 days after the decision to cease operations. Certification will also be required once the fuel is permanently removed from the reactor vessel. Submittal of these notices will entitle the licensee to a fee reduction and eliminate the obligation to follow certain requirements needed only during operation of the reactor. Within two years of submitting notice of permanent cessation of operations, the licensee is required to submit a Post-Shutdown Decommissioning Activities Report (PSDAR) to the NRC. The PSDAR describes the planned decommissioning activities, the associated sequence and schedule, and an estimate of expected costs. Prior to completing decommissioning, the licensee is required to submit an application to the NRC to terminate the license, which will include a license termination plan (LTP).

In 2011, the NRC published amended regulations to improve decommissioning planning and thereby reduce the likelihood that any current operating facility will become a legacy site.[8] The amended regulations require licensees to conduct their operations to minimize the introduction of residual radioactivity into the site, which includes the site's subsurface soil and groundwater. Licensees also may be required to perform site surveys to determine whether residual radioactivity is present in subsurface areas and to keep records of these surveys with records important for decommissioning. The amended regulations require licensees to report additional details in their decommissioning cost estimate as well as requiring additional financial reporting and assurances. These additional details, including an ISFSI decommissioning estimate, are included in this analysis.

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1.3.1 Nuclear Waste Policy Act

Congress passed the "Nuclear Waste Policy Act"[9] (NWPA) in 1982, assigning the federal government's long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. The DOE was to begin accepting spent fuel and high-level waste by January 31, 1998; however, to date no progress in the removal of spent fuel from commercial generating sites has been made.

Today, the country is at an impasse on high-level waste disposal, despite DOE's submittal of its License Application for a geologic repository to the NRC in 2008. The Obama administration eliminated the budget for the repository program while promising to "conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle … and make recommendations for a new plan."[10] Towards this goal, the Obama administration appointed a Blue Ribbon Commission on America's Nuclear Future (Blue Ribbon Commission) to make recommendations for a new plan for nuclear waste disposal. The Blue Ribbon Commission's charter included a requirement that it consider "[o]ptions for safe storage of used nuclear fuel while final disposition pathways are selected and deployed."

On January 26, 2012, the Blue Ribbon Commission issued its "Report to the Secretary of Energy"[11] containing a number of recommendations on nuclear waste disposal. Two of the recommendations that may impact decommissioning planning are:

- "[T]he United States [should] establish a program that leads to the timely development of one or more consolidated storage facilities"
- "[T]he United States should undertake an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geological facilities for the safe disposal of spent fuel and high-level nuclear waste."

In January 2013, the DOE issued the "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," in response to the recommendations made by the Blue Ribbon Commission and as "a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel..."[12]

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"With the appropriate authorizations from Congress, a program could be implemented over the next 10 years that:

- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048."

The NRC's review of DOE's license application to construct a geologic repository at Yucca Mountain was suspended in 2011 when the Obama administration significantly reduced the budget for completing that work. However, the US Court of Appeals for the District of Columbia Circuit issued a writ of mandamus (in August 2013)[13] ordering NRC to comply with federal law and resume its review of DOE's Yucca Mountain repository license application to the extent allowed by previously appropriated funding for the review. That review is now complete with the publication of the five-volume safety evaluation report. A supplement to DOE's environmental impact statement and adjudicatory hearing on the contentions filed by interested parties must be completed before a licensing decision can be made.

Even with a favorable review, there is considerable uncertainty as to DOE's future actions on the growing backlog of spent fuel, even with the additional direction provided by the Blue Ribbon Commission. For purposes of this analysis, DEF evaluated the feasibility of several spent fuel disposition scenarios, both near (e.g., 2021) and long-term (e.g., 2048), as well as a more moderate scenario.

For purposes of this estimate, the spent fuel management plan for the CR-3 spent fuel is based in general upon: 1) a 2034 start date for DOE initiating transfer of commercial spent fuel to a federal facility, 2) priority pickup for shutdown reactors, and 3) pickup based on the permanent shutdown date of the plant (oldest fuel first). Assuming a maximum rate of transfer of 3,000 metric tons of uranium (MTU)/year, [14] and the aforementioned assumptions on spent fuel management, transfer

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of spent fuel from commercial generators would begin in 2034, with the spent fuel from CR-3 removed from the site by the end of 2037.

The NRC requires that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor site until title of the fuel is transferred to the DOE.[15] An ISFSI, operated under a Part 50 General License (in accordance with 10 CFR 72, Subpart K),[16] has been constructed to accommodate all spent fuel generated over the plant life. Interim storage of the fuel, until the DOE has completed the transfer is at the on-site ISFSI.

DOE has breached its obligations to remove fuel from reactor sites, and has also failed to provide the plant owner with information about how it will ultimately perform. DOE officials have stated that DOE does not have an obligation to accept already-canistered fuel without an amendment to DOE's contracts with plant licensees to remove the fuel (the "Standard Contract"), but DOE has not explained what costs any such amendment would involve. Consequently, the plant owner has no information or expectations on how DOE will remove fuel from the site in the future. In the absence of information about how DOE will specifically deal with already-canistered fuel, and for purposes of this analysis only, this cost estimate assumes that there will be no additional costs associated with DOE's acceptance of such fuel. If this assumption is incorrect, it is assumed that DOE will have liability for costs incurred to transfer the fuel to DOE-supplied containers, and to dispose of existing containers.

DEF's position is that the DOE has a contractual obligation to accept the spent fuel earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim.

1.3.2 Low-Level Radioactive Waste Acts

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is classified as low-level (radioactive) waste, although not all of the material is suitable for "shallow-land" disposal. With the passage of the "Low-Level Radioactive Waste Policy Act" in 1980,[17] and its Amendments of 1985,[18] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

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With the exception of Texas, no new compact facilities have been successfully sited, licensed, and constructed. The Texas Compact disposal facility is now operational and waste is being accepted from generators within the Compact by the operator, Waste Control Specialists (WCS). The facility is also able to accept limited volumes of non-Compact waste.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to DEF. The majority of the low-level radioactive waste designated for direct disposal (Class A[19]) can be sent to Energy*Solutions*' facility in Clive, Utah. Therefore, disposal costs for Class A waste were based upon DEF's *Life of Plant Agreement* with Energy*Solutions*. This facility is not licensed to receive higher activity waste (Class B and C).

The WCS facility is able to receive the Class B and C waste. As such, for this analysis, Class B and C waste is assumed to be shipped to the WCS facility and disposal costs for the waste were based upon preliminary and indicative information on the cost for such from WCS.

The dismantling of the components residing closest to the reactor core generates radioactive waste that may be considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance.

For purposes of this study, components that must be disposed of as GTCC waste would be packaged in the same canisters used for spent fuel. Because dismantlement would occur after the projected date for DOE acceptance of spent fuel and high level waste, for purposes of this study it is assumed that the canisters would be shipped directly to a DOE facility.

A significant portion of the waste material generated during decommissioning may only be potentially contaminated by radioactive materials. This waste can be analyzed on site or shipped off site to

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licensed facilities for further analysis, for processing and/or for conditioning/recovery. Reduction in the volume of low-level radioactive waste requiring disposal in a licensed low-level radioactive waste disposal facility can be accomplished through a variety of methods, including analyses and surveys or decontamination to eliminate the portion of waste that does not require disposal as radioactive waste, compaction, incineration or metal melt. The estimate reflects the savings from waste recovery/volume reduction.

1.3.3 Radiological Criteria for License Termination

In 1997, the NRC published Subpart E, "Radiological Criteria for License Termination,"[20] amending 10 CFR Part 20. This subpart provides radiological criteria for releasing a facility for unrestricted use. The regulation states that the site can be released for unrestricted use if radioactivity levels are such that the average member of a critical group would not receive a Total Effective Dose Equivalent (TEDE) in excess of 25 millirem per year, and provided that residual radioactivity has been reduced to levels that are As Low As Reasonably Achievable (ALARA).

The decommissioning estimate assumes that the CR-3 site will be remediated to the levels specified in 10 CFR 20.1402, "Radiological criteria for unrestricted use," although the remediation measures included in this estimate are believed to be sufficient to result in substantially lower levels than required by the foregoing regulation.

It should be noted that the NRC and the Environmental Protection Agency (EPA) differ on the amount of residual radioactivity considered acceptable in site remediation. The EPA has two limits that apply to radioactive materials. An EPA limit of 15 millirem per year is derived from criteria established by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund).[21] An additional and separate limit of 4 millirem per year, as defined in 40 CFR §141.16, is applied to drinking water.[22]

On October 9, 2002, the NRC signed an agreement with the EPA on the radiological decommissioning and decontamination of NRC-licensed sites. The Memorandum of Understanding (MOU)[23] provides that EPA will defer exercise of authority under CERCLA for the majority of facilities decommissioned under NRC authority. The MOU also includes provisions for NRC and EPA consultation for certain sites when, at the time of license termination, (1) groundwater contamination exceeds EPA-permitted levels; (2) NRC contemplates restricted release of the

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site; and/or (3) residual radioactive soil concentrations exceed levels defined in the MOU.

The MOU does not impose any new requirements on NRC licensees and should reduce the involvement of the EPA with NRC licensees who are decommissioning. Most sites are expected to meet the NRC criteria for unrestricted use, and the NRC believes that only a few sites will have groundwater or soil contamination in excess of the levels specified in the MOU that trigger consultation with the EPA. However, if there are other hazardous materials on the site, the EPA may be involved in the cleanup. As such, the possibility of dual regulation remains for certain licensees. The present study does not include any costs for this occurrence.

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2. SAFSTOR DECOMMISSIONING ALTERNATIVE

A detailed cost estimate was developed to decommission the CR-3 nuclear unit for the SAFSTOR decommissioning alternative. The following narrative describes the basic activities associated with the alternative. Although detailed procedures for each activity identified are not provided, and the actual sequence of work may vary, the activity descriptions provide a basis not only for estimating but also for the expected scope of work, i.e., engineering and planning at the time of decommissioning.

The conceptual approach that the NRC has described in its regulations divides decommissioning into three phases. The initial phase commences with the effective date of permanent cessation of operations and involves the transition of both plant and licensee from reactor operations (i.e., power production) to facility de-activation and closure. During the first phase, notification is to be provided to the NRC certifying the permanent cessation of operations and the removal of fuel from the reactor vessel. The licensee is then prohibited from reactor operation.

The second phase encompasses activities during the storage period or during major decommissioning activities, or a combination of the two. The third phase pertains to the activities involved in license termination. The decommissioning estimate developed for CR-3 is also divided into phases or periods; however, demarcation of the periods is based upon major milestones within the project or significant changes in the projected expenditures.

2.1 PERIOD 1 - PREPARATIONS

The NRC defines SAFSTOR as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use." The facility is left intact (during the dormancy period), with structures maintained in a sound condition. Systems that are not required to support the spent fuel pool or site surveillance and security are drained, de-energized, and secured. Minimal cleaning/removal of loose contamination and/or fixation and sealing of remaining contamination are performed. Access to contaminated areas is secured to provide controlled access for inspection and maintenance.

Preparations for long-term storage include the revision of technical specifications appropriate to the operating conditions and requirements (i.e., permanently shutdown technical specifications), a characterization of the facility and major components, and the development of the PSDAR.

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DEF submitted the certification of permanent cessation of power operations and removal of fuel from the reactor to the NRC on February 20, 2013. A PSDAR was subsequently submitted on December 2, 2013,[24] which included a description of the planned decommissioning activities, a schedule for their accomplishment, a site-specific decommissioning cost estimate, and a discussion that provided the basis for concluding that the environmental impacts associated with decommissioning activities will be bounded by appropriate, previously issued, environmental impact statements.

On June 11, 2015, DEF notified the NRC that they were planning to perform (i) certain activities that constitute a schedule change from those actions and schedules described in the PSDAR and associated site-specific decommissioning cost estimate, and (ii) certain construction activities with associated costs that were neither described in nor contemplated by the PSDAR and associated decommissioning cost estimate.[25] The activities included:

1. Disposal of legacy waste (i.e., retired steam generators, reactor vessel closure head and hot leg piping) from the site (included in the prior estimate and now completed).

2. Demolition of the Ready Warehouse to permit a change in the security footprint of the plant once the fuel was off loaded to the ISFSI (included in the prior estimate and now completed).

3. The construction of an ISFSI and associated security modifications (a spent fuel management expense not included in the prior estimate but now complete).

Once the ISFSI had been constructed, the spent fuel was transferred from the spent fuel pool to the horizontal storage modules located on the ISFSI pad. DEF provided notice to the NRC of its first campaign, under the CR-3 general license, in July 2017. The transfer was completed in January 2018.

The estimate excludes those costs incurred prior to January 2018. It does include the costs identified to complete the preparations for long-term storage, based upon the budgeted costs through the year 2019.

2.2 PERIOD 2 - DORMANCY

The second phase identified by the NRC in its rule addresses licensed activities during a storage period and is applicable to the dormancy phases of the deferred decommissioning alternatives. Dormancy activities include a 24-hour

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security force, preventive and corrective maintenance on security systems, area lighting, general building maintenance, heating and ventilation of buildings, routine radiological inspections of contaminated structures, maintenance of structural integrity, and a site environmental and radiation monitoring program. Resident maintenance personnel perform equipment maintenance, inspection activities, routine services to maintain safe conditions, adequate lighting, heating, and ventilation, and periodic preventive maintenance on essential site services.

An environmental surveillance program is carried out during the dormancy period to monitor and control releases of radioactive material to the environment. Appropriate emergency procedures are established and initiated for potential releases that exceed prescribed limits. The environmental surveillance program constitutes an abbreviated version of the program in effect during normal plant operations.

Security during the dormancy period is conducted primarily to safe-guard the spent fuel while on site and prevent unauthorized entry. The security fence, sensors, alarms, and other surveillance equipment provide security. Fire and radiation alarms are also monitored and maintained.

For purposes of planning and this cost estimate, the transfer of the spent fuel from the ISFSI to a DOE facility is assumed to be complete by the end of 2037, although transfer could occur earlier if DOE is successful in implementing its current strategy for the management and disposal of spent fuel. The ISFSI will then be secured for long-term storage and decommissioned along with the power block structures in Period 4.

2.3 PERIOD 3 - PREPARATIONS FOR DECOMMISSIONING

CR-3 is currently expected to remain in safe storage until 2067, at which time preparations for decommissioning would commence. The period of storage was based upon, and considered, the available financial resources, projected fund growth and the cost to complete decommissioning and plant dismantlement.

Prior to the commencement of decommissioning operations, preparations are undertaken to reactivate site services and prepare for decommissioning. Preparations include engineering and planning, a detailed site characterization, and the assembly of a decommissioning management organization. Final planning for activities and the writing of activity specifications and detailed procedures are also initiated at this time.

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At least two years prior to the anticipated date of license termination, an LTP is required. Submitted as a supplement to the Final Safety Analysis Report (FSAR) or its equivalent, the plan must include: a site characterization, description of the remaining dismantling activities, plans for site remediation, procedures for the final radiation survey, designation of the end use of the site, an updated cost estimate to complete the decommissioning, and any associated environmental concerns. The NRC will notice the receipt of the plan, make the plan available for public comment, and schedule a local hearing. LTP approval will be subject to any conditions and limitations as deemed appropriate by the Commission.

2.4 PERIOD 4 - DECOMMISSIONING

This period includes the physical decommissioning activities associated with the removal and disposal of contaminated and activated components and structures, including the successful termination of the 10 CFR §50 operating license. Although the initial radiation levels due to ^{60}Co will decrease during the dormancy period, the internal components of the reactor vessel will still exhibit sufficiently high radiation dose rates to require remote sectioning under water due to the presence of long-lived radionuclides such as ^{94}Nb, ^{59}Ni, and ^{63}Ni. Portions of the biological shield will also be radioactive due to the presence of activated trace elements with long half-lives (^{152}Eu and ^{154}Eu). Decontamination will require controlled removal and disposal. It is assumed that radioactive corrosion products on inner surfaces of piping and components will not have decayed to levels that will permit unrestricted use or allow conventional removal. These systems and components will be surveyed as they are removed and disposed of in accordance with the existing radioactive release criteria.

Significant decommissioning activities in this phase include:

- Reconfiguration and modification of site structures and facilities, as needed to support decommissioning operations. This may include establishing a centralized processing area to facilitate equipment removal and component preparation for off-site disposal. Modifications may also be required to the reactor building to facilitate access of de-construction equipment, support the segmentation of the reactor vessel internals, and for large component extraction.
- Design and fabrication of temporary and permanent shielding to support removal and transportation activities, construction of contamination control envelopes, and the procurement of specialty tooling.

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- Procurement (lease or purchase) of shipping canisters, cask liners, and industrial packages for the disposition of low-level radioactive waste.
- Decontamination of components and piping systems as required to control (minimize) worker exposure.
- Removal of piping and components no longer essential to support decommissioning operations.
- Removal of control rod drive housings and the head service structure from the reactor vessel head.
- Removal and segmentation of the plenum assembly. Segmentation will maximize the loading of the shielded transport casks, (i.e., by weight and activity). The operations will be conducted under water using remotely operated tooling and contamination controls.
- Disassembly and segmentation, if necessary, of the remaining reactor internals, including the core former and baffles and lower core support assembly. Depending on packaging, some material may exceed Class C disposal requirements. Any such material will be packaged in transportable canisters similar to canisters used for spent fuel for transfer to DOE.
- Segmentation / removal of the reactor vessel. If segmented, a shielded platform will be installed for segmentation as cutting operations will be performed in-air using remotely operated equipment within a contamination control envelope. The water level will be maintained just below the cut to minimize the working area dose rates. Segments will be transferred in-air to containers that are stored under water, for example, in an isolated area of the refueling canal.
- Removal of the activated and contaminated portions of the concrete biological shield and accessible contaminated concrete surfaces. If dictated by the steam generator and pressurizer removal scenarios, those portions of the associated D-rings necessary for access and component extraction will be removed.
- Removal of the steam generators for processing and pressurizer for controlled disposal. The generators will be moved to an on-site processing center and prepared for transport to the waste processor. To facilitate transport, the generators will be cut in half, across the tube bundle. The exposed ends will be capped and sealed. The pressurizer will be disposed of intact.
- Removal of remaining plant systems and associated components as they become nonessential to the decommissioning program or worker health and safety (e.g., waste collection and treatment systems, electrical power and ventilation systems).

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- Removal of the steel liners from refueling canal, disposing of the activated and contaminated sections as radioactive waste. Removal of any activated/contaminated concrete.
- Surveys of the decontaminated areas of the reactor building.
- Remediation and removal of the contaminated equipment and material from the auxiliary building and any other contaminated area. Radiation and contamination controls will be utilized until residual levels indicate that the structures and equipment can be released for unrestricted access and conventional demolition. This activity may necessitate the dismantling and disposition of most of the systems and components (both clean and contaminated) located within these areas. This activity facilitates surface decontamination and subsequent verification surveys required prior to obtaining release for demolition.
- Routing of material removed in the decontamination and dismantling to a central processing area. Material certified to be free of contamination will be released for unrestricted disposition, e.g., as scrap, recycle, or general disposal. Contaminated material will be characterized and segregated for additional off-site processing (disassembly, chemical cleaning, volume reduction, and waste treatment), and/or packaged for controlled disposal at a low-level radioactive waste disposal facility.
- Remediation of the west settling pond (approximately 500 cubic yards), and the excavation and removal of the station drain tank line, as well as the underground portions of the nitrogen line.

Incorporated into the LTP is the Final Survey Plan. This plan identifies the radiological surveys to be performed once the decontamination activities are completed and is developed using the guidance provided in the "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)."[26] This document incorporates the statistical approaches to survey design and data interpretation used by the EPA. It also identifies commercially available instrumentation and procedures for conducting radiological surveys. Use of this guidance ensures that the surveys are conducted in a manner that provides a high degree of confidence that applicable NRC criteria are satisfied. Once the survey is complete, the results are provided to the NRC in a format that can be verified. The NRC then reviews and evaluates the information, performs an independent confirmation of radiological site conditions, and makes a determination on release of the property for unrestricted use and license termination.

The NRC will terminate the operating license if it determines that site remediation has been performed in accordance with the LTP, and that the

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terminal radiation survey and associated documentation demonstrate that the facility is suitable for release.

2.5 PERIOD 5 - SITE RESTORATION

The efficient removal of the contaminated materials at the site may result in damage to many of the site structures. Blasting, coring, drilling, and the other decontamination activities can substantially damage power block structures, potentially weakening the footings and structural supports. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. Dismantling site structures with a work force already mobilized is more efficient and less costly than if the process is deferred. Consequently, this study assumes that site structures addressed by this analysis are removed to a nominal depth of three feet below the top grade of the embankment, wherever possible.

The three-foot depth allows for the placement of gravel for drainage, as well as topsoil, so that vegetation can be established for erosion control. Site areas affected by the dismantling activities are restored and the plant area graded as required to prevent ponding and inhibit the refloating of subsurface materials.

Non-contaminated concrete rubble produced by demolition activities is processed to remove reinforcing steel and miscellaneous embedments. The processed material is then used on site to backfill foundation voids. Excess non-contaminated materials are trucked to an off-site area for disposal as construction debris.

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3. COST ESTIMATE

The cost estimate prepared for decommissioning CR-3 considers the unique features of the site, including the NSSS, power generation systems, support services, site buildings, and ancillary facilities. The basis of the estimate, including the sources of information relied upon, the estimating methodology employed, site-specific considerations, and other pertinent assumptions, is described in this section.

3.1 BASIS OF ESTIMATE

The estimate was developed using the site-specific, technical information from the 2013 analysis. This information was reviewed for the current analysis and updated as deemed appropriate. The site-specific considerations and assumptions used in the previous evaluation were also revisited. Modifications were incorporated where new information was available or experience from ongoing decommissioning programs provided viable alternatives or improved processes.

3.2 METHODOLOGY

The methodology used to develop the estimate follows the basic approach originally presented in the AIF/NESP-036 study report, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates,"[27] and the DOE "Decommissioning Handbook."[28] These documents present a unit factor method for estimating decommissioning activity costs, which simplifies the estimating calculations. Unit factors for concrete removal ($/cubic yard), steel removal ($/ton), and cutting costs ($/inch) are developed using local labor rates. The activity-dependent costs are estimated with the item quantities (cubic yards and tons), developed from plant drawings and inventory documents. Removal rates and material costs for the conventional disposition of components and structures rely upon information available in the industry publication, "Building Construction Cost Data," published by RSMeans.[29]

The unit factor method provides a demonstrable basis for establishing reliable cost estimates. The detail provided in the unit factors, including activity duration, labor costs (by craft), and equipment and consumable costs, ensures that essential elements have not been omitted. Appendix A presents the detailed development of a typical unit factor. Appendix B provides the values contained within one set of factors developed for this analysis.

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This analysis reflected lessons learned from TLG's involvement in the Shippingport Station decommissioning, completed in 1989, as well as the decommissioning of the Cintichem reactor, hot cells, and associated facilities, completed in 1997. In addition, the planning and engineering for the Pathfinder, Shoreham, Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Connecticut Yankee, Vermont Yankee and Fort Calhoun nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

Work Difficulty Factors

TLG has historically applied work difficulty adjustment factors (WDFs) to account for the inefficiencies in working in a power plant environment. WDFs are assigned to each unique set of unit factors, commensurate with the inefficiencies associated with working in confined, hazardous environments. The ranges used for the WDFs are as follows:

- Access Factor 10% to 20%
- Respiratory Protection Factor 0% to 50%
- Radiation/ALARA Factor 0% to 15%
- Protective Clothing Factor 0% to 30%
- Work Break Factor 8.33%

The factors and their associated range of values were developed in conjunction with the AIF/NESP-036 study. The application of the factors is discussed in more detail in that publication.

Scheduling Program Durations

The unit factors, adjusted by the WDFs as described above, are applied against the inventory of materials to be removed in the radiological controlled areas. The resulting man-hours, or crew-hours, are used in the development of the decommissioning program schedule, using resource loading and event sequencing considerations. The scheduling of conventional removal and dismantling activities is based upon productivity information available from the "Building Construction Cost Data" publication.

An activity duration critical path is used to determine the total decommissioning program schedule. The schedule is relied upon in calculating the carrying costs, which include program management, administration, field

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engineering, equipment rental, and support services such as quality control and security. This systematic approach for assembling decommissioning estimates ensures a high degree of confidence in the reliability of the resulting costs.

3.3 FINANCIAL COMPONENTS OF THE COST MODEL

TLG's proprietary decommissioning cost model, DECCER, produces a number of distinct cost elements. These direct expenditures, however, do not comprise the total cost to accomplish the project goal, i.e., license termination and site restoration.

3.3.1 Contingency

Inherent in any cost estimate that does not rely on historical data is the inability to specify the precise source of costs imposed by factors such as tool breakage, accidents, illnesses, weather delays, and labor stoppages. In the DECCER cost model, contingency fulfills this role. Contingency is added to each line item to account for costs that are difficult or impossible to develop analytically. Such costs are historically inevitable over the duration of a job of this magnitude; therefore, this cost analysis includes funds to cover these types of expenses.

The activity- and period-dependent costs are combined to develop the total decommissioning cost. A contingency is then applied on a line-item basis, using one or more of the contingency types listed in the AIF/NESP-036 study. "Contingencies" are defined in the American Association of Cost Engineers "Project and Cost Engineers' Handbook"[30] as "specific provision for unforeseeable elements of cost within the defined project scope; particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur." The cost elements in this analysis are based upon ideal conditions and maximum efficiency; therefore, consistent with industry practice, contingency is included. In the AIF/NESP-036 study, the types of unforeseeable events that are likely to occur in decommissioning are discussed and guidelines are provided for percentage contingency in each category. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the station.

Contingency funds are an integral part of the total cost to complete the decommissioning process. Exclusion of this component puts at risk a

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successful completion of the intended tasks and, potentially, subsequent related activities. For this study, TLG examined the major activity-related problems (decontamination, segmentation, equipment handling, packaging, transport, and waste disposal) that necessitate a contingency. Individual activity contingencies ranged from 10% to 75%, depending on the degree of difficulty judged to be appropriate from TLG's actual decommissioning experience. The contingency values used in this study are as follows:

- Decontamination 50%
- Contaminated Component Removal 25%
- Contaminated Component Packaging 10%
- Contaminated Component Transport 15%
- Low-Level Radioactive Waste Disposal 25%

- Low-Level Radioactive Waste Processing 15%
- Reactor Segmentation 75%
- NSSS Component Removal 25%
- Reactor Waste Packaging 25%
- Reactor Waste Transport 25%

- Reactor Vessel Component Disposal 50%
- GTCC Disposal 15%
- Non-Radioactive Component Removal 15%
- Heavy Equipment and Tooling 15%
- Construction 15%

- Supplies 25%
- Engineering 15%
- Energy 15%
- Characterization and Termination Surveys 30%
- Spent Fuel Transfer 15%

- ISFSI Decommissioning 25%
- Operations and Maintenance 15%
- Taxes and Fees 10%
- Insurance 10%
- Staffing (plant, contractor and security) 15%

The contingency values are applied to the appropriate components of the estimate on a line item basis, except where actual budgets were provided or estimates for activities provided by DEF assume to include contingency.

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3.3.2 Financial Risk

In addition to the routine uncertainties addressed by contingency, another cost element that is sometimes necessary to consider when bounding decommissioning costs relates to uncertainty, or risk. Examples can include changes in work scope, pricing, job performance, and other variations that could conceivably, but not necessarily, occur. Consideration is sometimes necessary to generate a level of confidence in the estimate, within a range of probabilities. TLG considers these types of costs under the broad term "financial risk." Included within the category of financial risk are:

- Delays in approval of the decommissioning plan due to intervention, public participation in local community meetings, legal challenges, and national and local hearings.
- Changes in the project work scope from the baseline estimate, involving the discovery of unexpected levels of contaminants, contamination in places not previously expected, contaminated soil previously undiscovered (either radioactive or hazardous material contamination), variations in plant inventory or configuration not indicated by the as-built drawings.
- Regulatory changes, for example, affecting worker health and safety, site release criteria, waste transportation, and disposal.
- Policy decisions altering national commitments (e.g., in the ability to accommodate certain waste forms for disposition), or in the timetable for such, for example, the start and rate of acceptance of spent fuel by the DOE.
- Pricing changes for basic inputs such as labor, energy, materials, and disposal. Items subject to widespread price competition (such as materials) may not show significant variation; however, others such as waste disposal could exhibit large pricing uncertainties, particularly in markets where limited access to services is available.

This cost study does not add any additional costs to the estimate for financial risk, since there is insufficient historical data from which to project future liabilities. Consequently, the areas of uncertainty or risk should be revisited periodically and addressed through revisions or updates of the base estimate.

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3.4 SITE-SPECIFIC CONSIDERATIONS

There are a number of site-specific considerations that affect the method for dismantling and removal of equipment from the site and the degree of restoration required. The cost impact of the considerations identified below is included in this cost study.

3.4.1 Spent Fuel Management

The cost to dispose the spent fuel generated from plant operations is not reflected within the estimate to decommission CR-3. Ultimate disposition of the spent fuel is within the province of the DOE's Waste Management System, as defined by the Nuclear Waste Policy Act. Until recently, the disposal cost is financed by a 1 mill/kWhr surcharge paid into the DOE's waste fund during operations. On November 19, 2013, the U.S. Court of Appeals for the D.C. Circuit ordered the Secretary of the Department of Entergy to suspend collecting annual fees for nuclear waste disposal from nuclear power plant operators however, require licensees to establish a program to manage and provide funding for the management of all irradiated fuel at the reactor site until title of the fuel is transferred to the Secretary of Energy.

Completion of the decommissioning process is highly dependent upon the DOE's ability to remove spent fuel from the site. The timing for removal of spent fuel from the site is based upon an internal DEF probability assessment and the most recent information from the DOE on likely future actions regarding interim and long-term solutions to spent fuel disposition.

For purposes of this estimate, the spent fuel management plan for the CR-3 spent fuel is based in general upon: 1) a 2034 start date for DOE initiating transfer of commercial spent fuel to a federal facility, 2) priority pickup for shutdown reactors, and 3) pickup based on the permanent shutdown date of the plant (oldest fuel first). Assuming a maximum rate of transfer of 3,000 metric tons of uranium (MTU)/year,[31] and the aforementioned assumptions on spent fuel management, the spent fuel from CR-3 would be completely removed from the site by the end of 2037.

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ISFSI

An ISFSI has been constructed adjacent to the power block and used to off-load the spent fuel pool. The relocation of the spent fuel from the wet storage pool to the ISFSI was completed in January 2018.

Storage Canister Design

Spent fuel is currently stored in NUHOMS®-32PH1 Type 2-W dry storage system. The systems consist of a stainless steel Dry Shielded Canister (DSC), and a concrete Horizontal Storage Module (HSM), which houses the DSC during storage. The DSCs can house up to 32 spent fuel assemblies each.

Canister Transfer

For estimating purposes, an allowance was used for the transfer of the fuel from the ISFSI into a DOE transport cask.

Operations and Maintenance

The estimate includes the cost for operation and maintenance of the ISFSI. ISFSI operations are expected to continue through December 2037, based upon the previously outlined assumptions on DOE performance.

ISFSI Decommissioning

In accordance with 10 CFR §72.30, licensees must have a proposed decommissioning plan for the ISFSI site and facilities that includes a cost estimate to implement. The plan should contain sufficient information on the proposed practices and procedures for the decontamination of the ISFSI and for the disposal of residual radioactive materials after all spent fuel, high-level radioactive waste, and reactor-related GTCC waste have been removed.

As an allowance for HSM remediation, 6 modules are assumed to have some level of neutron-induced activation after approximately 20 years of storage (i.e., to levels exceeding free-release limits), equivalent to the number of modules required to accommodate the final core off load. The steel support structure is assumed to be removed from these modules and sent, along with the concrete, for controlled disposal. The cost of the

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disposition of this material, as well as the demolition of the ISFSI facility, is included in the estimate.

Minor contamination of the ISFSI pad is assumed. Funding has been added to the DCE to address areas of concern. It would be expected that this assumption would be confirmed as a result of good radiological practice of surveying potentially impacted areas after each spent fuel transfer campaign. The estimate is limited to costs necessary to terminate the ISFSI's NRC license and meet the §20.1402 criteria for unrestricted use.

Prior to constructing the ISFSI pad, the top soil was sampled and remediated where trace amounts of contamination were detected. This estimate assumes that no additional remediation of the soil in the vicinity of the ISFSI is necessary.

The cost estimate for decommissioning the ISFSI reflects: 1) the cost of an independent contractor performing the decommissioning activities; 2) an adequate contingency factor; and 3) the cost to remove the ISFSI pads, concrete apron and concrete wave steps; and 4) the cost of meeting the criteria for unrestricted use. The cost summary for decommissioning the ISFSI is presented in Appendix D.

GTCC

The dismantling of the reactor internals generates radioactive waste considered unsuitable for shallow land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the Federal Government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the Federal Government has not identified a cost for disposing of GTCC or a schedule for acceptance. For purposes of this estimate, the GTCC radioactive waste has been assumed to be packaged in transportable canisters similar to canisters used for spent fuel and disposed of as high-level waste, at a cost equivalent to that envisioned for the spent fuel.

The GTCC material is assumed to be shipped directly to a DOE facility as it is generated from the segmentation of the reactor vessel internals.

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3.4.2 Reactor Vessel and Internal Components

The reactor pressure vessel and internal components are segmented for disposal in shielded, reusable transportation casks. Segmentation is performed in the refueling canal, where a turntable and remote cutter are installed. The vessel is segmented in place, using a mast-mounted cutter supported off the lower head and directed from a shielded work platform installed overhead in the reactor cavity. Transportation cask specifications and transportation regulations dictate the segmentation and packaging methodology.

Intact disposal of reactor vessel shells has been successfully demonstrated at several of the sites currently being decommissioned. Access to navigable waterways has allowed these large packages to be transported to the Barnwell disposal site with minimal overland travel. Intact disposal of the reactor vessel and internal components can provide savings in cost and worker exposure by eliminating the complex segmentation requirements, isolation of the GTCC material, and transport/storage of the resulting waste packages. Portland General Electric (PGE) was able to dispose of the Trojan reactor as an intact package (including the internals). However, its location on the Columbia River simplified the transportation analysis since:

- the reactor package could be secured to the transport vehicle for the entire journey, i.e., the package was not lifted during transport,
- there were no man-made or natural terrain features between the plant site and the disposal location that could produce a large drop, and
- transport speeds were very low, limited by the overland transport vehicle and the river barge.

As a member of the Northwest Compact, PGE had a site available for disposal of the package - the US Ecology facility in Washington State. The characteristics of this arid site proved favorable in demonstrating compliance with land disposal regulations.

It is not known whether this option will be available to CR-3. Future viability of this option will depend upon the ultimate location of the disposal site, as well as the disposal site licensee's ability to accept highly radioactive packages and effectively isolate them from the environment. Consequently, the study assumes the reactor vessel will

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require segmentation, as a bounding condition. With lower levels of activation, the vessel shell can be packaged more efficiently than the curie-limited internal components. This will allow the use of more conventional waste packages rather than shielded casks for transport.

3.4.3 Primary System Components

Due to the natural decay of radionuclides over the dormancy period, a chemical decontamination of the primary coolant system is not included.

The following discussion deals with the removal and disposition of the steam generators, but the techniques involved are also applicable to other large components, such as heat exchangers, component coolers, and the pressurizer. The steam generators' size and weight, as well as their location within the reactor building, will ultimately determine the removal strategy.

A trolley crane is set up for the removal of the generators. It can also be used to move portions of the steam generator cubicle walls and floor slabs from the reactor building to a location where they can be decontaminated and transported to the material handling area. Interferences within the work area, such as grating, piping, and other components are removed to create sufficient laydown space for processing these large components.

The generators are rigged for removal, disconnected from the surrounding piping and supports, and maneuvered into the open area where they are lowered onto a dolly. Each generator is rotated into the horizontal position for extraction from the reactor building and placed onto a multi-wheeled vehicle for transport to an on-site processing and storage area.

The generators are segmented on-site to facilitate transportation. Each unit is cut in half, across the tube bundle. The exposed ends are capped and sealed. Each component is then loaded onto a rail car for transport to the waste processing facility.

Reactor coolant piping is cut from the reactor vessel once the water level in the vessel (used for personnel shielding during dismantling and cutting operations in and around the vessel) is dropped below the nozzle zone. The piping is boxed and transported by shielded van. The reactor coolant pumps and motors are lifted out intact, packaged, and transported for processing and/or disposal.

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3.4.4 Main Turbine and Condenser

The main turbine is dismantled using conventional maintenance procedures. The turbine rotors and shafts are removed to a laydown area. The lower turbine casings are removed from their anchors by controlled demolition. The main condensers are also disassembled and moved to a laydown area. Material is then prepared for transportation to an off-site recycling facility where it is surveyed and designated for either decontamination or volume reduction, conventional disposal, or controlled disposal. Components are packaged and readied for transport in accordance with the intended disposition.

3.4.5 Transportation Methods

Contaminated piping, components, and structural material other than the highly activated reactor vessel and internal components will qualify as LSA-I, II or III or Surface Contaminated Object, SCO-I or II, as described in Title 49.[32] The contaminated material will be packaged in Industrial Packages (IP-1, IP-2, or IP-3, as defined in subpart 173.411) for transport unless demonstrated to qualify as their own shipping containers. The reactor vessel and internal components are expected to be transported in accordance with Part 71, as Type B. It is conceivable that the reactor, due to its limited specific activity, could qualify as LSA II or III. However, the high radiation levels on the outer surface would require that additional shielding be incorporated within the packaging so as to attenuate the dose to levels acceptable for transport.

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., ^{137}Cs, ^{90}Sr, or transuranics) has been prevented from reaching levels exceeding those that permit the major reactor components to be shipped under current transportation regulations and disposal requirements.

Transport of the highly activated metal, produced in the segmentation of the reactor vessel and internal components, will be by shielded truck cask. Cask shipments may exceed 95,000 pounds, including vessel segment(s), supplementary shielding, cask tie-downs, and tractor-trailer. The maximum level of activity per shipment assumed permissible was based upon the license limits of the available shielded transport casks. The segmentation scheme for the vessel and internal segments is designed to meet these limits.

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The transport of large intact components (e.g., large heat exchangers and other oversized components) will be by a combination of truck, rail, and/or multi-wheeled transporter.

Transportation costs for material requiring controlled disposal are based upon the mileage to the Energy*Solutions* facility in Clive, Utah and the Waste Control Specialist facility in Andrews County, Texas. Transportation costs for off-site waste processing are based upon the mileage to Oak Ridge, Tennessee. Truck transport costs are estimated using published tariffs from Tri-State Motor Transit.[33]

The transportation cost for the GTCC material is assumed to be included in the disposal cost.

3.4.6 Low-Level Radioactive Waste Disposal

To the greatest extent practical, metallic material generated in the decontamination and dismantling processes is processed to reduce the total cost of controlled disposal. Material meeting the regulatory and/or site release criterion, is released as scrap, requiring no further cost consideration. Conditioning (preparing the material to meet the waste acceptance criteria of the disposal site) and recovery of the waste stream is performed off site at a licensed processing center. Any material leaving the site is subject to a survey and release charge, at a minimum.

The mass of radioactive waste generated during the various decommissioning activities at the site is shown on a line-item basis in Appendix C, and summarized in Section 5. The quantified waste summaries shown in these tables are consistent with 10 CFR Part 61 classifications. Commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations. The volumes are calculated based on the exterior package dimensions for containerized material or a specific calculation for components serving as their own waste containers.

The more highly activated reactor components will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload.

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Disposal fees are based upon estimated charges, with higher rates applying for the highly activated components, for example, generated in the segmentation of the reactor vessel. The cost to dispose of the lowest level and majority of the material generated from the decontamination and dismantling activities is based upon the current cost for disposal at Energy*Solutions* facility in Clive, Utah. Disposal costs for the higher activity waste (Class B and C) are based upon preliminary and indicative information on the cost for such from WCS.

The estimate includes a Florida Department of Health inspection fee; applied to the volume of low-level radioactive waste shipped to commercial low-level radioactive waste management facilities for treatment, storage, or disposal (Florida Radiation Protection Act, s. 404.131(3)(a)).

Material exceeding Class C limits (limited to material closest to the reactor core and comprising less than 1% of the total waste volume) is generally not suitable for shallow-land disposal. This material is packaged in the same multi-purpose canisters used for spent fuel transport.

3.4.7 Site Conditions Following Decommissioning

The NRC will terminate the site license if it determines that site remediation has been performed in accordance with the license termination plan, and that the terminal radiation survey and associated documentation demonstrate that the facility is suitable for release. The NRC's involvement in the decommissioning process will end at this point. Local building codes and state environmental regulations will dictate the next step in the decommissioning process, as well as the owner's own future plans for the site.

Non-essential structures or buildings severely damaged in decontamination process are removed to a nominal depth of three feet below the top grade of the embankment (i.e., 118'-6"), wherever possible. The embankment and the foundations of buildings located on the embankment, below this elevation, will be abandoned in place. Below grade voids will be filled with clean concrete rubble (processed to removed rebar), generated from demolition activities. Excess construction debris is trucked off site as an alternative to onsite disposal. Certain facilities, which have continued use or value (e.g., the switchyard) are left intact.

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The intake and discharge canals are abandoned. No remediation is anticipated.

Costs are included for the remediation of minor quantities of asbestos containing materials (e.g., gaskets, insulation, construction materials) and for the remediation of the firing range (i.e., removal of soil containing lead residue).

3.5 ASSUMPTIONS

The following are the major assumptions made in the development of the estimate for decommissioning the site.

3.5.1 Estimating Basis

The study follows the principles of ALARA through the use of work duration adjustment factors. These factors address the impact of activities such as radiological protection instruction, mock-up training, and the use of respiratory protection and protective clothing. The factors lengthen a task's duration, increasing costs and lengthening the overall schedule. ALARA planning is considered in the costs for engineering and planning, and in the development of activity specifications and detailed procedures. Changes to worker exposure limits may impact the decommissioning cost and project schedule.

3.5.2 Labor Costs

DEF, as the licensee, will continue to provide site operations support, including decommissioning program management, licensing, radiological protection, and site security. A Decommissioning Operations Contractor (DOC) will provide the supervisory staff needed to oversee the labor subcontractors, consultants, and specialty contractors needed to perform the work required for the decontamination and dismantling effort. The DOC will also provide the engineering services needed to develop activity specifications, detailed procedures, detailed activation analyses, and support field activities such as structural modifications.

Site personnel costs are based upon average salary information provided by DEF. Overhead costs are included for site and corporate support, and reduced commensurate with the staffing of the project.
The craft labor required to decontaminate and dismantle the nuclear unit is acquired through standard site contracting practices. The current cost of labor at the site is used as an estimating basis.

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Security, while reduced from operating levels, is maintained throughout the decommissioning for access control, material control, and to safeguard the spent fuel. Once the spent fuel is removed from the site, the organization is converted from a "nuclear" to an industrial security force.

3.5.3 Design Conditions

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., ^{137}Cs, ^{90}Sr, or transuranics) has been prevented from reaching levels exceeding those that permit the major NSSS components to be shipped under current transportation regulations and disposal requirements.

The curie contents of the vessel and internals at final shutdown are derived from those listed in NUREG/CR-3474.[34] Actual estimates are derived from the curie/gram values contained therein and adjusted for the different mass of the CR-3 components, operating life, and period of decay. Additional short-lived isotopes were derived from NUREG/CR-0130[35] and NUREG/CR-0672,[36] and benchmarked to the long-lived values from NUREG/CR-3474.

The control elements are disposed of along with the spent fuel, i.e., there is no additional cost provided for their disposal. Neutron activation of the containment building structure is assumed to be confined to the biological shield.

3.5.4 General

Transition Activities

Existing warehouses are cleared of non-essential material and remain for use by DEF and its subcontractors. The plant's operating staff performs the following activities at no additional cost or credit to the project during the transition period:

- Drain and collect fuel oils, lubricating oils, and transformer oils for recycle and/or sale.
- Drain and collect acids, caustics, and other chemical stores for recycle and/or sale.

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- Process operating waste inventories, i.e., the estimate does not address the disposition of any legacy wastes; the disposal of operating wastes during this initial period is not considered a decommissioning expense.

Scrap and Salvage

The existing plant equipment is considered obsolete and suitable for scrap as deadweight quantities only. DEF will make economically reasonable efforts to salvage equipment. However, dismantling techniques assumed by TLG for equipment in this analysis are not consistent with removal techniques required for salvage (resale) of equipment. Experience has indicated that some buyers wanted equipment stripped down to very specific requirements before they would consider purchase. This required expensive rework after the equipment had been removed from its installed location. Since placing a salvage value on this machinery and equipment would be speculative, and the value would be small in comparison to the overall decommissioning expenses, this analysis does not attempt to quantify the value that an owner may realize based upon those efforts.

It is assumed, for purposes of this analysis, that any value received from the sale of scrap generated in the dismantling process would be more than offset by the on-site processing costs. The dismantling techniques assumed in the decommissioning estimate do not include the additional cost for size reduction and preparation to meet "furnace ready" conditions. For example, the recovery of copper from electrical cabling may require the removal and disposition of any contaminated insulation, an added expense. With a volatile market, the potential profit margin in scrap recovery is highly speculative, regardless of the ability to free release this material. This assumption is an implicit recognition of scrap value in the disposal of clean metallic waste at no additional cost to the project.

Furniture, tools, mobile equipment such as forklifts, trucks, bulldozers, and other property is removed at no cost or credit to the decommissioning project. Disposition may include relocation to other facilities. Spare parts are also made available for alternative use.

Equipment and materials acquired for the power uprate, and not installed, are assumed to be dispositioned at no net cost or credit to the project.

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Energy

For estimating purposes, the plant is assumed to be de-energized, with the exception of those facilities associated with spent fuel storage. Replacement power costs are used to calculate the cost of energy consumed during decommissioning for tooling, lighting, ventilation, and essential services.

Insurance

Costs for continuing coverage (nuclear liability and property insurance) during decommissioning are included and based upon operating premiums. Reductions in premiums, upon entering dormancy and beyond, are based upon the guidance provided in SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning."[37] The NRC's financial protection requirements are based on various reactor (and spent fuel) configurations. Insurance credits were provided by DEF.

Taxes

The estimate includes an allowance for property tax.

Site Modifications

The perimeter fence and in-plant security barriers will be moved, as appropriate, to conform to the Site Security Plan in force during the various stages of the project.

3.6 COST ESTIMATE SUMMARY

Schedules of expenditures are provided in Tables 3.1 through 3.4. The tables delineate the cost contributors by year of expenditures as well as cost contributor (e.g., labor, materials, and waste disposal).

The cost elements are also assigned to one of three subcategories: "License Termination," "Spent Fuel Management," and "Site Restoration." The subcategory "License Termination" is used to accumulate costs that are consistent with "decommissioning" as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). In situations where the long-term management of spent fuel is not an issue, the cost reported for this subcategory is generally sufficient to terminate the unit's operating license.

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The "Spent Fuel Management" subcategory contains costs associated with the operations of the ISFSI until such time that the transfer is complete. It does not include any spent fuel management expenses incurred prior to January 1, 2018, including the cost to construct the ISFSI and transfer the spent fuel from the storage pool, nor does it include any costs related to the final disposal of the spent fuel.

"Site Restoration" is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels.

As noted within this document, the estimate is developed and costs are presented in 2017 dollars. As such, the estimate does not reflect the escalation of costs (due to inflationary and market forces) during the decommissioning project. Schedules of expenditures are based upon the detailed activity costs reported in Appendix C, along with the schedule presented in Section 4.

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TABLE 3.1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Total
2018	17,875	1,461	0	1,258	24,790	45,384
2019	14,285	1,251	0	363	3,583	19,482
2020	8,108	138	0	8	2,109	10,363
2021	8,086	138	0	8	2,185	10,417
2022	8,086	138	0	8	2,103	10,335
2023	8,086	138	0	8	2,103	10,335
2024	8,108	138	0	8	2,191	10,445
2025	8,086	138	0	8	2,103	10,335
2026	8,086	138	0	8	2,103	10,335
2027	8,086	138	0	8	2,185	10,417
2028	8,108	138	0	8	2,109	10,363
2029	8,086	138	0	8	2,103	10,335
2030	8,086	138	0	8	2,185	10,417
2031	8,086	138	0	8	2,103	10,335
2032	8,108	138	0	8	2,109	10,363
2033	8,086	138	0	8	2,185	10,417
2034	8,086	138	0	8	2,103	10,335
2035	8,086	138	0	8	2,103	10,335
2036	8,108	138	0	8	2,191	10,445
2037	9,331	3,871	0	8	2,103	15,313
2038	2,102	120	0	7	1,713	3,941
2039	2,102	120	0	7	1,795	4,023
2040	2,107	121	0	7	1,717	3,952
2041	2,102	120	0	7	1,713	3,941
2042	2,102	120	0	7	1,713	3,941
2043	2,102	120	0	7	1,713	3,941
2044	2,107	121	0	7	1,717	3,952
2045	2,102	120	0	7	1,713	3,941
2046	2,102	120	0	7	1,713	3,941
2047	2,102	120	0	7	1,713	3,941
2048	2,107	121	0	7	1,717	3,952
2049	2,102	120	0	7	1,713	3,941
2050	2,102	120	0	7	1,713	3,941

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TABLE 3.1 (continued)
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Total
2051	2,102	120	0	7	1,713	3,941
2052	2,107	121	0	7	1,717	3,952
2053	2,102	120	0	7	1,713	3,941
2054	2,102	120	0	7	1,713	3,941
2055	2,102	120	0	7	1,713	3,941
2056	2,107	121	0	7	1,717	3,952
2057	2,102	120	0	7	1,713	3,941
2058	2,102	120	0	7	1,713	3,941
2059	2,102	120	0	7	1,713	3,941
2060	2,107	121	0	7	1,717	3,952
2061	2,102	120	0	7	1,713	3,941
2062	2,102	120	0	7	1,713	3,941
2063	2,102	120	0	7	1,713	3,941
2064	2,107	121	0	7	1,717	3,952
2065	2,102	120	0	7	1,713	3,941
2066	2,102	120	0	7	1,713	3,941
2067	22,464	1,183	730	23	1,869	26,270
2068	47,585	10,015	1,191	3,988	3,643	66,422
2069	51,808	25,765	1,135	35,217	15,216	129,142
2070	49,630	18,379	1,011	25,680	12,820	107,521
2071	47,602	11,502	896	16,800	10,589	87,388
2072	38,435	5,514	495	6,554	6,117	57,115
2073	18,154	9,700	136	4	3,562	31,555
2074	10,140	7,003	76	0	2,305	19,524
Total	525,871	101,477	5,671	90,218	172,656	895,893

Note: Columns may not add due to rounding

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TABLE 3.2
LICENSE TERMINATION EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Total
2018	7,620	342	0	1,258	11,142	20,362
2019	5,078	184	0	363	2,132	7,757
2020	5,648	138	0	8	1,604	7,398
2021	5,633	138	0	8	1,600	7,377
2022	5,633	138	0	8	1,600	7,377
2023	5,633	138	0	8	1,600	7,377
2024	5,648	138	0	8	1,604	7,398
2025	5,633	138	0	8	1,600	7,377
2026	5,633	138	0	8	1,600	7,377
2027	5,633	138	0	8	1,600	7,377
2028	5,648	138	0	8	1,604	7,398
2029	5,633	138	0	8	1,600	7,377
2030	5,633	138	0	8	1,600	7,377
2031	5,633	138	0	8	1,600	7,377
2032	5,648	138	0	8	1,604	7,398
2033	5,633	138	0	8	1,600	7,377
2034	5,633	138	0	8	1,600	7,377
2035	5,633	138	0	8	1,600	7,377
2036	5,648	138	0	8	1,604	7,398
2037	5,633	138	0	8	1,600	7,377
2038	2,102	120	0	7	1,713	3,941
2039	2,102	120	0	7	1,713	3,941
2040	2,107	121	0	7	1,717	3,952
2041	2,102	120	0	7	1,713	3,941
2042	2,102	120	0	7	1,713	3,941
2043	2,102	120	0	7	1,713	3,941
2044	2,107	121	0	7	1,717	3,952
2045	2,102	120	0	7	1,713	3,941
2046	2,102	120	0	7	1,713	3,941
2047	2,102	120	0	7	1,713	3,941
2048	2,107	121	0	7	1,717	3,952
2049	2,102	120	0	7	1,713	3,941
2050	2,102	120	0	7	1,713	3,941

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TABLE 3.2 (continued)
LICENSE TERMINATION EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Total
2051	2,102	120	0	7	1,713	3,941
2052	2,107	121	0	7	1,717	3,952
2053	2,102	120	0	7	1,713	3,941
2054	2,102	120	0	7	1,713	3,941
2055	2,102	120	0	7	1,713	3,941
2056	2,107	121	0	7	1,717	3,952
2057	2,102	120	0	7	1,713	3,941
2058	2,102	120	0	7	1,713	3,941
2059	2,102	120	0	7	1,713	3,941
2060	2,107	121	0	7	1,717	3,952
2061	2,102	120	0	7	1,713	3,941
2062	2,102	120	0	7	1,713	3,941
2063	2,102	120	0	7	1,713	3,941
2064	2,107	121	0	7	1,717	3,952
2065	2,102	120	0	7	1,713	3,941
2066	2,102	120	0	7	1,713	3,941
2067	22,037	1,183	730	23	1,869	25,843
2068	46,226	10,005	1,191	3,988	3,643	65,053
2069	50,292	25,681	1,135	35,217	15,216	127,541
2070	48,474	18,325	1,011	25,680	12,820	106,311
2071	46,782	11,475	896	16,800	10,589	86,541
2072	38,116	5,503	495	6,554	6,117	56,786
2073	4,577	232	33	4	446	5,292
2074	97	0	0	0	0	97
Total	431,747	78,901	5,491	90,218	142,486	748,844

Note: Columns may not add due to rounding

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TABLE 3.3
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Total
2018	10,255	1,119	0	0	13,379	24,753
2019	9,207	1,067	0	0	1,286	11,560
2020	2,461	0	0	0	505	2,966
2021	2,454	0	0	0	586	3,040
2022	2,454	0	0	0	504	2,958
2023	2,454	0	0	0	504	2,958
2024	2,461	0	0	0	587	3,048
2025	2,454	0	0	0	504	2,958
2026	2,454	0	0	0	504	2,958
2027	2,454	0	0	0	586	3,040
2028	2,461	0	0	0	505	2,966
2029	2,454	0	0	0	504	2,958
2030	2,454	0	0	0	586	3,040
2031	2,454	0	0	0	504	2,958
2032	2,461	0	0	0	505	2,966
2033	2,454	0	0	0	586	3,040
2034	2,454	0	0	0	504	2,958
2035	2,454	0	0	0	504	2,958
2036	2,461	0	0	0	587	3,048
2037	3,698	3,733	0	0	504	7,935
2038	0	0	0	0	0	0
2039	0	0	0	0	82	82
Total [1]	64,908	5,919	0	0	24,316	95,143

Note: Columns may not add due to rounding

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TABLE 3.4
SITE RESTORATION EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Total
2018	0	0	0	0	269	269
2019	0	0	0	0	165	165
2020-66	0	0	0	0	0	0
2067	427	0	0	0	0	427
2068	1,359	9	0	0	0	1,368
2069	1,516	84	0	0	0	1,600
2070	1,156	54	0	0	0	1,210
2071	820	27	0	0	0	847
2072	319	10	0	0	0	329
2073	13,577	9,468	103	0	3,116	26,264
2074	10,042	7,003	76	0	2,305	19,427
Total	29,216	16,657	179	0	5,854	51,906

Note: Columns may not add due to rounding

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4. SCHEDULE ESTIMATE

The schedule for the decommissioning scenario considered in this study follows the sequences presented in the AIF/NESP-036 study, with minor changes to reflect recent experience and site-specific constraints. In addition, the scheduling has been revised to reflect the spent fuel management plan described in Section 3.4.1.

The start and end dates of the decommissioning subperiods are shown in Table 4.1. A schedule or sequence of activities for the deferred decommissioning portion of the SAFSTOR alternative is presented in Figure 4.1. The scheduling sequence assumes that fuel has been removed from the site prior to the start of decontamination and dismantling activities. The key activities listed in the schedule do not reflect a one-to-one correspondence with those activities in the cost tables, but reflect dividing some activities for clarity and combining others for convenience. The schedule was prepared using the "Microsoft Project Professional" computer software.[38]

4.1 SCHEDULE ESTIMATE ASSUMPTIONS

The schedule reflects the results of a precedence network developed for the site decommissioning activities, i.e., a PERT (Program Evaluation and Review Technique) Software Package. The work activity durations used in the precedence network reflect the actual person-hour estimates from the cost table, adjusted by stretching certain activities over their slack range and shifting the start and end dates of others. The following assumptions were made in the development of the decommissioning schedule:

- All work (except vessel and internals removal) is performed during an 8-hour workday, 5 days per week, with no overtime. There are eleven paid holidays per year.
- Reactor and internals removal activities are performed by using separate crews for different activities working on different shifts, with a corresponding backshift charge for the second shift.
- Multiple crews work parallel activities to the maximum extent possible, consistent with optimum efficiency, adequate access for cutting, removal and laydown space, and with the stringent safety measures necessary during demolition of heavy components and structures.
- For plant systems removal, the systems with the longest removal durations in areas on the critical path are considered to determine the duration of the activity.

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4.2 PROJECT SCHEDULE

The period-dependent costs presented in the detailed cost tables are based upon the durations developed in the schedules for decommissioning. Durations are established between several milestones in each project period; these durations are used to establish a critical path for the entire project. In turn, the critical path duration for each period is used as the basis for determining the period-dependent costs.

The project timeline is provided in Figure 4.2 with milestone dates based on the 2013 declaration of permanent cessations of operations. The fuel pool is emptied by January 2018, while ISFSI operations continue until the DOE can complete the transfer of assemblies to its repository. Deferred decommissioning is assumed to commence in 2067 with the operating license is terminated within a 60-year period from the declared cessation of plant operations.

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TABLE 4.1
DECOMMISSIONING SCHEDULE

Decommissioning Periods	Start	End	Duration (years)
Period 1: Planning and Preparations [1]	1 Jan 2018	31 Aug 2019	1.66
	31 Aug 2019	1 Jan 2020	0.34
Period 2b: Dormancy w/Dry Fuel Storage	1 Jan 2020	1 Jan 2038	18.01
Period 2c: Dormancy w/No Fuel Storage	1 Jan 2038	23 May 2067	29.41
Period 3a: Site Reactivation	23 May 2067	22 May 2068	1.00
Period 3b: Decommissioning Prep	22 May 2068	21 Nov 2068	0.50
Period 4a: Large Component Removal	21 Nov 2068	26 Jun 2070	1.59
Period 4b: Plant Systems Removal and Building Remediation	26 Jun 2070	22 May 2072	1.91
Period 4f: License Termination	22 May 2072	20 Feb 2073	0.75
Period 5b: Site Restoration	20 Feb 2073	22 Aug 2074	1.50
Total [2]			56.68

[1] While permanent cessation of operations was declared on February 20, 2013, decommissioning costs are accumulated as of January 1, 2018

[2] Columns may not add due to rounding

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FIGURE 4.1
DEFERRED DECOMMISSIONING ACTIVITY SCHEDULE

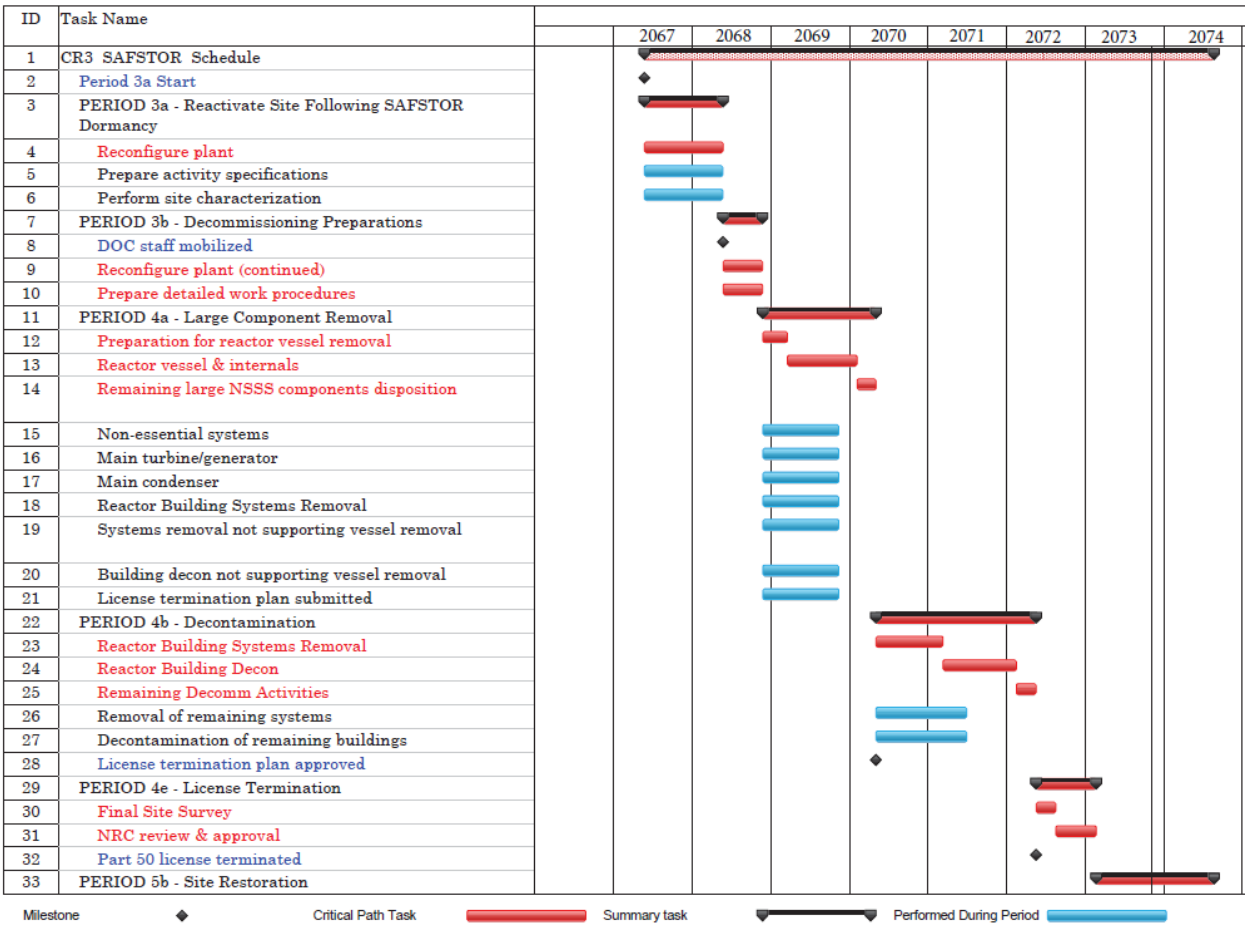

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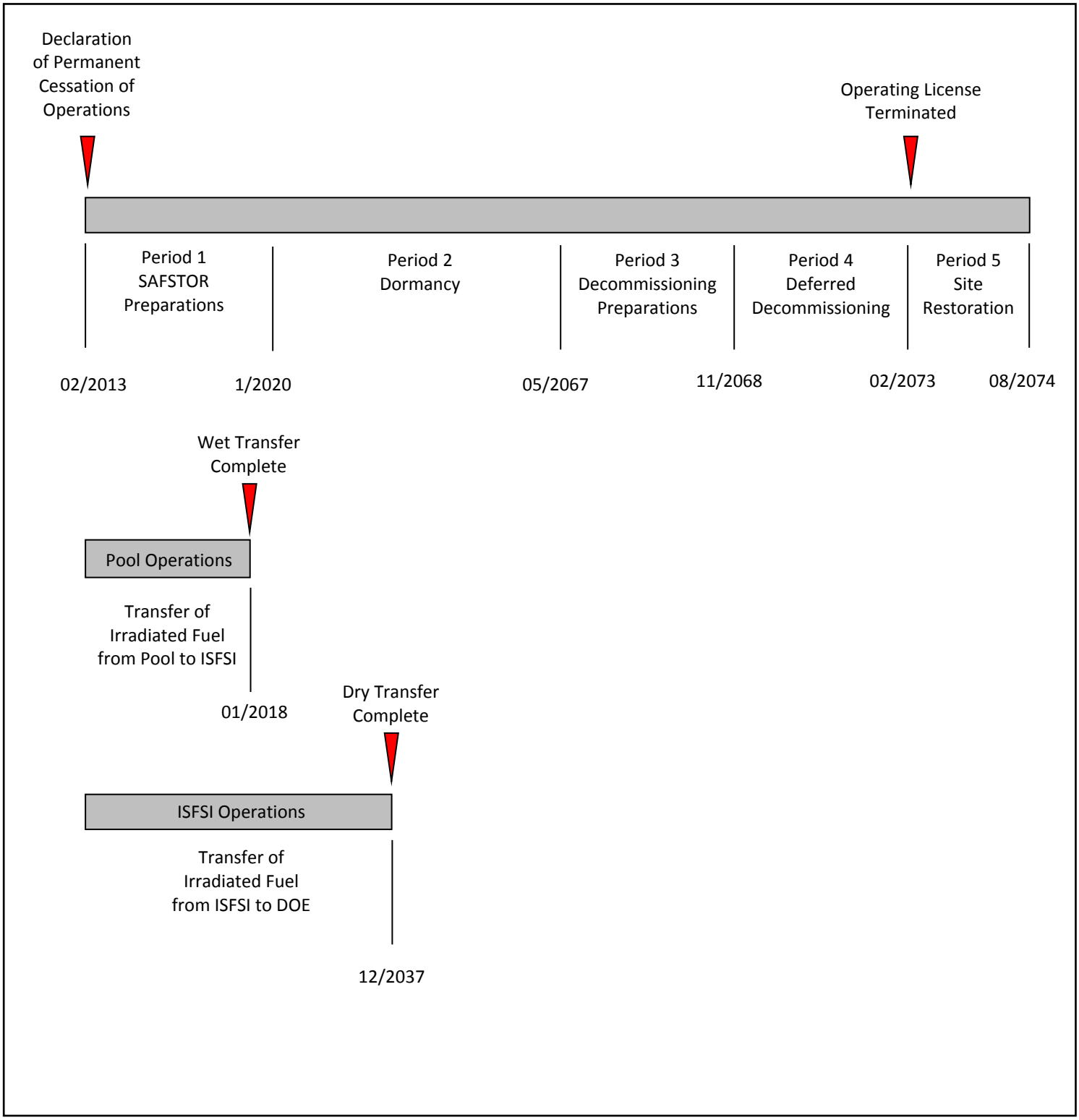
FIGURE 4.2
DECOMMISSIONING TIMELINE
(not to scale)



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5. RADIOACTIVE WASTES

The objectives of the decommissioning process are the removal of all radioactive material from the site that would restrict its future use and the termination of the NRC license. This currently requires the remediation of all radioactive material at the site in excess of applicable legal limits. Under the Atomic Energy Act,[39] the NRC is responsible for protecting the public from sources of ionizing radiation. Title 10 of the Code of Federal Regulations delineates the production, utilization, and disposal of radioactive materials and processes. In particular, Part 71 defines radioactive material as it pertains to transportation and Part 61 specifies its disposition.

Most of the materials being transported for controlled burial are categorized as Low Specific Activity (LSA) or Surface Contaminated Object (SCO) materials containing Type A quantities, as defined in 49 CFR Parts 173-178. Shipping containers are required to be Industrial Packages (IP-1, IP-2 or IP-3, as defined in 10 CFR §173.411). For this study, commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations.

The destinations for the various waste streams from decommissioning are identified in Figure 5.1. The volumes are shown on a line-item basis in Appendix C and summarized in Table 5.1. The volumes are calculated based on the exterior dimensions for containerized material and on the displaced volume of components serving as their own waste containers.

The reactor vessel and internals are categorized as large quantity shipments and, accordingly, will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping casks.

No process system containing/handling radioactive substances at shutdown is presumed to meet material release criteria by decay alone (i.e., systems radioactive at shutdown will still be radioactive over the time period during which the decommissioning is accomplished, due to the presence of long-lived radionuclides). While the dose rates decrease with time, radionuclides such as ^{137}Cs will still control the disposition requirements.

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The waste material produced in the decontamination and dismantling of the nuclear plant is primarily generated during Period 4 of SAFSTOR. Material that is considered potentially contaminated when removed from the radiological controlled area (e.g., concrete and dry active waste) and metal with low levels of contamination are sent to processing facilities in Tennessee for conditioning and disposal. The disposal volumes reported in the tables reflect the savings resulting from reprocessing and recycling. Heavily contaminated components and activated materials are routed for direct, controlled disposal.

Disposal costs for Class A waste were based upon DEF's *Life of Plant Agreement* with Energy*Solutions*. Separate rates were used for containerized waste and large components, including the pressurizer and reactor coolant pumps. Demolition debris including miscellaneous steel, scaffolding, and concrete was disposed of at a bulk rate. The decommissioning waste stream also includes resins and dry active waste.

Since Energy*Solutions* is not currently able to receive the more highly radioactive components generated in the decontamination and dismantling of the reactor, disposal costs for the Class B and C material were based upon preliminary and indicative information on the cost for such waste from WCS.

The estimate includes a Florida Department of Health inspection fee; applied to the volume of low-level radioactive waste shipped to commercial low-level radioactive waste management facilities for treatment, storage, or disposal (Florida Radiation Protection Act, s. 404.131(3)(a)).

A small quantity of material will be generated during the decommissioning will not be considered suitable for near-surface disposal, and is assumed to be disposed of in a geologic repository, in a manner similar to that envisioned for spent fuel disposal. This material, known as GTCC material, is estimated to require four transportable canisters similar to canisters used for spent fuel (or the equivalent) to dispose of the most radioactive portions of the reactor vessel internals. The volume and weight reported in Table 5.1 represents the packaged weight and volume of the spent fuel storage canisters.

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FIGURE 5.1
DECOMMISSIONING WASTE DISPOSITION

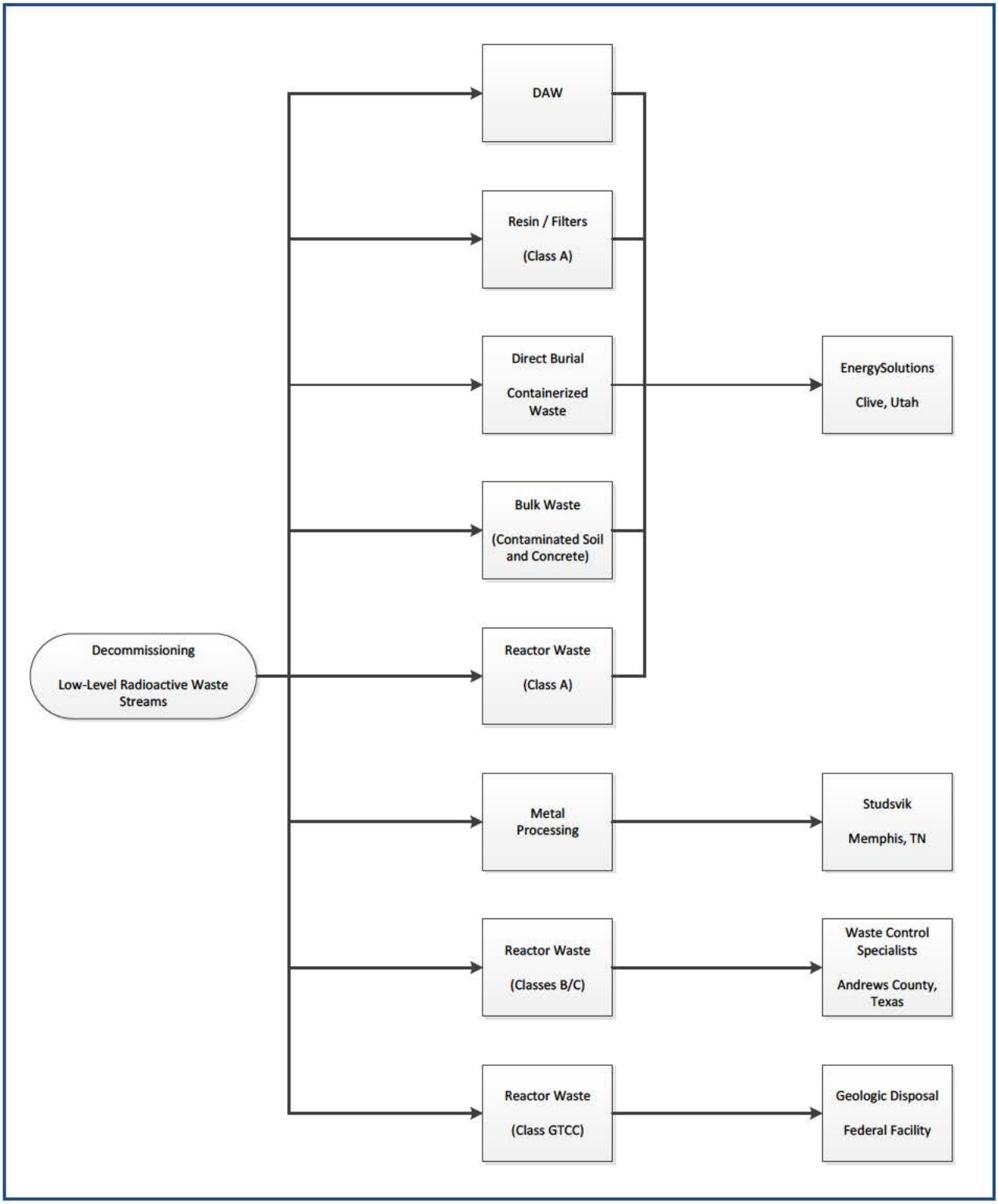

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TABLE 5.1
DECOMMISSIONING WASTE SUMMARY

Waste	Cost Basis	Class [1]	Waste Form	Waste Volume (cubic feet)	Weight (pounds)
Low-Level Radioactive Waste (near-surface disposal)	Energy*Solutions*	A	Containerized	63,045	5,254,804
		A	Bulk	124,425	7,887,996
	WCS	B	Shielded Cask	1,252	96,500
	WCS	C	Shielded Cask	462	59,891
GTCC (geologic repository or federal facility)	Spent Fuel Equivalent	GTCC	DSC	1,654	333,192
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	Bulk	279,217	10,750,300
Total [2]				470,055	24,382,683

[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

[2] Columns may not add due to rounding

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6. RESULTS

The analysis to estimate the cost to decommission CR-3 relied upon the site-specific, technical information developed for a previous analysis prepared in 2013. While not an engineering study, the estimate provides DEF with sufficient information to assess their financial obligations, as they pertain to the decommissioning of the nuclear station.

The estimate described in this report is based on numerous fundamental assumptions, including regulatory requirements, project contingencies, low-level radioactive waste disposal practices, high-level radioactive waste management options, and site restoration requirements. The decommissioning scenarios assume continued operation of the station's spent fuel pool until the spent fuel can be off-loaded to the ISFSI. The ISFSI will be used to safeguard the spent fuel until such time that the DOE can complete the transfer of the assemblies to its facility.

The cost projected for deferred decommissioning (SAFSTOR) is estimated to be $895.9 million. The majority of this cost (approximately 83.6%) is associated with placing the unit in storage, ongoing caretaking of the unit during dormancy, and the eventual physical decontamination and dismantling of the nuclear unit so that the operating license can be terminated. Another 10.6% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 5.8% is for the demolition of the designated structures and limited restoration of the site. The costs are allocated, by subperiod, into the categories of License Termination, Spent Fuel Management and Site Restoration in Table 6.1.

The primary cost contributors, identified in Table 6.2, are either labor-related or associated with the management and disposition of the radioactive waste. Program management is the largest single contributor to the overall cost. The magnitude of the expense is a function of both the size of the organization required to manage the decommissioning, as well as the duration of the program. It is assumed, for purposes of this analysis, that DEF will oversee the decommissioning program, using a DOC to manage the decommissioning labor force and the associated subcontractors. The size and composition of the management organization varies with the decommissioning phase and associated site activities. However, once the operating license is terminated, the staff is substantially reduced for the conventional demolition and restoration of the site.

The cost for waste disposal includes only those costs associated with the controlled disposition of the low-level radioactive waste generated from decontamination and dismantling activities, including plant equipment and components, structural material, filters, resins and dry-active waste. As described in Section 5, the

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Energy*Solutions* facility in Utah is the assumed destination for the majority of the low-level radioactive material required controlled disposal, with the remaining high-activity waste destined for Waste Control Specialists' facility in Texas. Components, requiring additional isolation from the environment (i.e., GTCC), are packaged for geologic disposal. The cost of geologic disposal is based upon a cost equivalent to spent fuel.

A significant portion of the metallic waste is designated for additional processing and treatment at an off-site facility. Processing reduces the volume of material requiring controlled disposal through such techniques and processes as survey and sorting, decontamination, and volume reduction. The material that cannot be unconditionally released is packaged for controlled disposal at one of the currently operating facilities. The cost identified in the summary tables for processing is all-inclusive, incorporating the ultimate disposition of the material.

Removal costs reflect the labor-intensive nature of the decommissioning process, as well as the management controls required to ensure a safe and successful program. Decontamination and packaging costs also have a large labor component that is based upon prevailing wages. Non-radiological demolition is a natural extension of the decommissioning process. The methods employed in decontamination and dismantling are generally destructive and indiscriminate in inflicting collateral damage. With a work force mobilized to support decommissioning operations, non-radiological demolition can be an integrated activity and a logical expansion of the work being performed in the process of terminating the operating license.

The reported cost for transport includes the tariffs and surcharges associated with moving large components and/or overweight shielded casks overland, as well as the general expense, e.g., labor and fuel, of transporting material to the destinations identified in this report. For purposes of this analysis, material is primarily moved overland by truck.

Decontamination is used to reduce the plant's radiation fields and minimize worker exposure. Slightly contaminated material or material located within a contaminated area is sent to an off-site processing center, i.e., this analysis does not assume that contaminated plant components and equipment can be decontaminated for uncontrolled release in-situ. Centralized processing centers have proven to be a more economical means of handling the large volumes of material produced in the dismantling of a nuclear unit.

License termination survey costs are associated with the labor intensive and complex activity of verifying that contamination has been removed from the site to the levels specified by the regulating agency. This process involves a systematic survey of all remaining plant surface areas and surrounding environs, sampling,

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isotopic analysis, and documentation of the findings. The status of any plant components and materials not removed in the decommissioning process will also require confirmation and will add to the expense of surveying the facilities alone.

The remaining costs include allocations for heavy equipment and temporary services, as well as for other expenses such as regulatory fees and the premiums for nuclear insurance. While site operating costs have been greatly reduced following the final cessation of plant operations, certain administrative functions do need to be maintained either at a basic functional or regulatory level.

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TABLE 6.1
DECOMMISSIONING COST SUMMARY
(thousands of 2017 dollars)

Decommissioning Periods	License Termination	Spent Fuel Management	Site Restoration
SAFSTOR I [1]	27,258	33,216	388
SAFSTOR II	861	3,097	46
Period 2b: Dormancy w/Dry Fuel Storage	132,896	58,748	-
Period 2c: Dormancy w/No Fuel Storage	115,898	82	-
Period 3a: Site Reactivation	39,789	-	699
Period 3b: Decommissioning Prep	35,247	-	917
Period 4a: Large Component Removal	203,367	-	2,552
Period 4b: Plant Systems Removal and Building Remediation	165,021	-	1,615
Period 4f: License Termination	28,278	-	-
Period 5b: Site Restoration	229	-	45,690
Total [2]	748,844	95,143	51,906

[1] Excludes costs expended prior to 2018
[2] Columns may not add due to rounding

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TABLE 6.2
DECOMMISSIONING COST ELEMENT CONTRIBUTION
(thousands of 2017 dollars)

Cost Element	Total	%
Preparations for Safe-Storage (2018-19) - Excluding Security	52,692	5.9
Preparations for Safe-Storage (2018-19) - Security	15,254	1.7
Preparations for Safe-Storage (2018-19) - Insurance and Taxes	-3,080	-0.3
Decontamination	6,932	0.8
Removal	124,129	13.9
Packaging	17,462	1.9
Transportation	13,387	1.5
Waste Disposal	65,816	7.3
Off-site Waste Processing	32,658	3.6
Program Management [1]	304,910	34.0
Security	99,554	11.1
Spent Fuel Management [2]	11,610	1.3
Insurance	20,686	2.3
Insurance Credits	-61,545	-6.9
Energy	5,671	0.6
Characterization and Licensing Surveys	37,007	4.1
Property Taxes	23,276	2.6
Miscellaneous Equipment	7,954	0.9
Non-Labor Reoccurring	92,703	10.3
Other	1,265	0.1
Corporate A&G	27,551	3.1
Total [3]	895,893	100.0

Cost Allocation	Total	%
License Termination	748,844	83.6
Spent Fuel Management	95,143	10.6
Site Restoration	51,906	5.8
Total [3]	895,893	100.0

[1] Includes engineering
[2] Includes costs for ISFSI O&M and spent fuel transfer costs to DOE
[3] Columns may not add due to rounding

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7. REFERENCES

1. "Site-Specific Decommissioning Cost Estimate for the Crystal River Unit 3 Nuclear Generating Plant," Document No. P23-1680-001, Rev. 1, TLG Services, Inc., December 2013

2. CR-3 to NRC letter dated February 20, 2013, "Crystal River Unit 3 - Certification of Permanent Cessation of Power Operations and that Fuel Has Been Permanently Removed from the Reactor" (ADAMS Accession No. ML13056A005)

3. U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70 and 72, "General Requirements for Decommissioning Nuclear Facilities," Nuclear Regulatory Commission, 53 Fed. Reg. 24018, June 27, 1988 [Open]

4. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," Rev. 2, October 2011 [Open]

5. U.S. Code of Federal Regulations, Title 10, Part 20, Subpart E, "Radiological Criteria for License Termination" [Open]

6. U.S. Code of Federal Regulations, Title 10, Parts 20 and 50, "Entombment Options for Power Reactors," Advance Notice of Proposed Rulemaking, 66 Fed. Reg. 52551, October 16, 2001 [Open]

7. U.S. Code of Federal Regulations, Title 10, Parts 2, 50 and 51, "Decommissioning of Nuclear Power Reactors," Nuclear Regulatory Commission, 61 Fed. Reg. 39278, July 29, 1996 [Open]

8. U.S. Code of Federal Regulations, Title 10, Parts 20, 30, 40, 50, 70, and 72, "Decommissioning Planning," Nuclear Regulatory Commission, Federal Register Volume 76, (p 35512 et seq.), June 17, 2011 [Open]

9. "Nuclear Waste Policy Act of 1982," 42 U.S. Code 10101, et seq. [Open]

10. Charter of the Blue Ribbon Commission on America's Nuclear Future, "Objectives and Scope of Activities" [Open]

11. "Blue Ribbon Commission on America's Nuclear Future, Report to the Secretary of Energy," p. 27, 32, January 2012 [Open]

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7. REFERENCES
(continued)

12. "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," U.S. DOE, January 11, 2013 [Open]

13. United States Court of Appeals for the District of Columbia Circuit, In Re: Aiken County, Et Al., August 2013 [Open]

14. "Acceptance Priority Ranking & Annual Capacity Report," DOE/RW-0567, July 2004

15. U.S. Code of Federal Regulations, Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," Subpart 54(bb), "Conditions of Licenses" [Open]

16. U.S. Code of Federal Regulations, Title 10, Part 72, Subpart K, "General License for Storage of Spent Fuel at Power Reactor Sites" [Open]

17. "Low-Level Radioactive Waste Policy Act," Public Law 96-573, 1980 [Open]

18. "Low-Level Radioactive Waste Policy Amendments Act of 1985," Public Law 99-240, January 15, 1986 [Open]

19. U.S. Code of Federal Regulations, Title 10, Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste" [Open]

20. U.S. Code of Federal Regulations, Title 10, Part 20, Subpart E, "Final Rule, Radiological Criteria for License Termination," 62 Fed. Reg. 39058, July 21, 1997 [Open]

21. "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination," EPA Memorandum OSWER No. 9200.4-18, August 22, 1997 [Open]

22. U.S. Code of Federal Regulations, Title 40, Part 141.66, "Maximum contaminant levels for radionuclides" [Open]

23. "Memorandum of Understanding Between the Environmental Protection Agency and the Nuclear Regulatory Commission: Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites," OSWER 9295.8-06a, October 9, 2002 [Open]

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7. REFERENCES
(continued)

24. CR-3 to NRC, dated December 2, 2013, "Post-Shutdown Decommissioning Activities Report," (ADAMS Accession No. ML13340A009)

25. CR-3 to NRC, dated June 11, 2015, "Notification of Schedule Changes for the Post-Shutdown Decommissioning Activities Report," (ADAMS Accession No. ML15175A188)

26. "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)," NUREG-1575, Rev. 1, EPA 402-R-97-016, Rev. 1, August 2000 [Open]

27. T.S. LaGuardia et al., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986

28. W.J. Manion and T.S. LaGuardia, "Decommissioning Handbook," U.S. Department of Energy, DOE/EV/10128-1, November 1980

29. "Building Construction Cost Data 2017," RSMeans (From the Gordian Group), Rockland, Massachusetts

30. Project and Cost Engineers' Handbook, Second Edition, p. 239, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, 1984

31. DOE/RW-0351, "Civilian Radioactive Waste Management System Waste Acceptance System Requirements Document", Revision 5, May 31, 2007 [Open]

32. U.S. Department of Transportation, Title 49 of the Code of Federal Regulations, "Transportation," Parts 173 through 178 [Open]

33. Tri-State Motor Transit Company, published tariffs Interstate Commerce Commission (ICC), Docket No. MC-427719 Rules Tariff, May 2014, Radioactive Materials Tariff, August 2014

34. J.C. Evans et al., "Long-Lived Activation Products in Reactor Materials" NUREG/CR-3474, Pacific Northwest Laboratory for the Nuclear Regulatory Commission, August 1984 [Open]

35. R.I. Smith, G.J. Konzek, W.E. Kennedy, Jr., "Technology, Safety and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station," NUREG/CR-0130 and addenda, Pacific Northwest Laboratory for the Nuclear Regulatory Commission, June 1978 [Open Main Report] [Open Appendices]

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7. REFERENCES
(continued)

36. H.D. Oak, et al., "Technology, Safety and Costs of Decommissioning a Reference Boiling Water Reactor Power Station," NUREG/CR-0672 and addenda, Pacific Northwest Laboratory for the Nuclear Regulatory Commission, June 1980 [Open Main Report] [Open Appendices]

37. SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning," June 2000

38. "Microsoft Project Professional 2010," Microsoft Corporation, Redmond, WA

39. "Atomic Energy Act of 1954," (68 Stat. 919) [Open]

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APPENDIX A

UNIT COST FACTOR DEVELOPMENT

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APPENDIX A
UNIT COST FACTOR DEVELOPMENT

Example: Unit Factor for Removal of Contaminated Heat Exchanger < 3,000 lbs.

1. SCOPE

Heat exchangers weighing < 3,000 lbs. will be removed in one piece using a crane or small hoist. They will be disconnected from the inlet and outlet piping. The heat exchanger will be sent to the waste processing area.

2. CALCULATIONS

Act ID	Activity Description	Activity Duration (minutes)	Critical Duration (minutes)*
a	Remove insulation	60	(b)
b	Mount pipe cutters	60	60
c	Install contamination controls	20	(b)
d	Disconnect inlet and outlet lines	60	60
e	Cap openings	20	(d)
f	Rig for removal	30	30
g	Unbolt from mounts	30	30
h	Remove contamination controls	15	15
i	Remove, wrap, send to waste processing area	60	60
	Totals (Activity/Critical)	355	255

Duration adjustment(s):	
+ Respiratory protection adjustment (50% of critical duration)	128
+ Radiation/ALARA adjustment (15% of critical duration)	38
Adjusted work duration	421
+ Protective clothing adjustment (30% of adjusted duration)	126
Productive work duration	547
+ Work break adjustment (8.33 % of productive duration)	46
Total work duration (minutes)	593

***** Total duration = 9.883 hours *****

* alpha designators indicate activities that can be performed in parallel

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APPENDIX A
(continued)

3. LABOR REQUIRED

Crew	Number	Duration (hours)	Rate ($/hr)	Cost
Laborers	3.00	9.883	$37.14	$1,101.16
Craftsmen	2.00	9.883	$49.53	$979.01
Foreman	1.00	9.883	$59.05	$583.59
General Foreman	0.25	9.883	$68.56	$169.39
Fire Watch	0.05	9.883	$37.14	$18.35
Health Physics Technician	1.00	9.883	$69.50	$686.87
Total Labor Cost				$3,538.37

4. EQUIPMENT & CONSUMABLES COSTS

Equipment Costs	none
Consumables/Materials Costs	
-Universal Sorbent 50 @ $0.68 sq ft {1}	$34.00
-Tarpaulins (oil resistant/fire retardant) 50 @ $0.51/sq ft {2}	$25.50
-Gas torch consumables 1 @ $22.64/hr x 1 hr {3}	$22.64
Subtotal cost of equipment and materials	$82.14
Overhead & profit on equipment and materials @ 16.00 %	$13.14
Total costs, equipment & material	$95.28

TOTAL COST:

Removal of contaminated **heat exchanger <3000 pounds:** **$3,633.65**

Total labor cost:	$3,538.37
Total equipment/material costs:	$95.28
Total craft labor man-hours required per unit:	72.15

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5. NOTES AND REFERENCES

- Work difficulty factors were developed in conjunction with the Atomic Industrial Forum's (now NEI) program to standardize nuclear decommissioning cost estimates and are delineated in Volume 1, Chapter 5 of the "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986.

- References for equipment & consumables costs:

    1. www.mcmaster.com online catalog, McMaster Carr Spill Control (7193T88)
    2. RSMeans (2017) Division 01 56, Section 13.60-0600, page 23
    3. RSMeans (2017) Division 01 54 33, Section 40-6360, page 718

- Material and consumable costs were adjusted using the regional indices for Tampa, Florida.

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APPENDIX B

UNIT COST FACTOR LISTING
(SAFSTOR: Power Block Structures Only)

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APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of clean instrument and sampling tubing, $/linear foot	0.43
Removal of clean pipe 0.25 to 2 inches diameter, $/linear foot	4.53
Removal of clean pipe >2 to 4 inches diameter, $/linear foot	6.61
Removal of clean pipe >4 to 8 inches diameter, $/linear foot	12.74
Removal of clean pipe >8 to 14 inches diameter, $/linear foot	24.33
Removal of clean pipe >14 to 20 inches diameter, $/linear foot	31.80
Removal of clean pipe >20 to 36 inches diameter, $/linear foot	46.74
Removal of clean pipe >36 inches diameter, $/linear foot	55.46
Removal of clean valve >2 to 4 inches	87.68
Removal of clean valve >4 to 8 inches	127.36
Removal of clean valve >8 to 14 inches	243.26
Removal of clean valve >14 to 20 inches	317.96
Removal of clean valve >20 to 36 inches	467.42
Removal of clean valve >36 inches	554.60
Removal of clean pipe hanger for small bore piping	31.70
Removal of clean pipe hanger for large bore piping	106.70
Removal of clean pump, <300 pound	218.43
Removal of clean pump, 300-1000 pound	597.04
Removal of clean pump, 1000-10,000 pound	2,346.11
Removal of clean pump, >10,000 pound	4,550.02
Removal of clean pump motor, 300-1000 pound	246.74
Removal of clean pump motor, 1000-10,000 pound	970.68
Removal of clean pump motor, >10,000 pound	2,184.04
Removal of clean heat exchanger <3000 pound	1,276.45
Removal of clean heat exchanger >3000 pound	3,230.67
Removal of clean feedwater heater/deaerator	8,989.71
Removal of clean moisture separator/reheater	18,327.96
Removal of clean tank, <300 gallons	280.54
Removal of clean tank, 300-3000 gallon	877.83
Removal of clean tank, >3000 gallons, $/square foot surface area	7.38

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APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of clean electrical equipment, <300 pound	116.08
Removal of clean electrical equipment, 300-1000 pound	401.72
Removal of clean electrical equipment, 1000-10,000 pound	803.45
Removal of clean electrical equipment, >10,000 pound	1,946.33
Removal of clean electrical transformer < 30 tons	1,351.70
Removal of clean electrical transformer > 30 tons	3,892.67
Removal of clean standby diesel generator, <100 kW	1,380.65
Removal of clean standby diesel generator, 100 kW to 1 MW	3,081.70
Removal of clean standby diesel generator, >1 MW	6,379.74
Removal of clean electrical cable tray, $/linear foot	11.08
Removal of clean electrical conduit, $/linear foot	4.85
Removal of clean mechanical equipment, <300 pound	116.08
Removal of clean mechanical equipment, 300-1000 pound	401.72
Removal of clean mechanical equipment, 1000-10,000 pound	803.45
Removal of clean mechanical equipment, >10,000 pound	1,946.33
Removal of clean HVAC equipment, <300 pound	140.37
Removal of clean HVAC equipment, 300-1000 pound	482.71
Removal of clean HVAC equipment, 1000-10,000 pound	962.02
Removal of clean HVAC equipment, >10,000 pound	1,946.33
Removal of clean HVAC ductwork, $/pound	0.45
Removal of contaminated instrument and sampling tubing, $/linear foot	1.39
Removal of contaminated pipe 0.25 to 2 inches diameter, $/linear foot	21.06
Removal of contaminated pipe >2 to 4 inches diameter, $/linear foot	33.85
Removal of contaminated pipe >4 to 8 inches diameter, $/linear foot	54.04
Removal of contaminated pipe >8 to 14 inches diameter, $/linear foot	102.36
Removal of contaminated pipe >14 to 20 inches diameter, $/linear foot	122.16
Removal of contaminated pipe >20 to 36 inches diameter, $/linear foot	167.46
Removal of contaminated pipe >36 inches diameter, $/linear foot	196.74
Removal of contaminated valve >2 to 4 inches	416.70
Removal of contaminated valve >4 to 8 inches	475.51

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APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of contaminated valve >8 to 14 inches	954.61
Removal of contaminated valve >14 to 20 inches	1,211.27
Removal of contaminated valve >20 to 36 inches	1,605.54
Removal of contaminated valve >36 inches	1,898.38
Removal of contaminated pipe hanger for small bore piping	138.24
Removal of contaminated pipe hanger for large bore piping	438.32
Removal of contaminated pump, <300 pound	845.78
Removal of contaminated pump, 300-1000 pound	1,908.86
Removal of contaminated pump, 1000-10,000 pound	5,960.03
Removal of contaminated pump, >10,000 pound	14,486.28
Removal of contaminated pump motor, 300-1000 pound	845.14
Removal of contaminated pump motor, 1000-10,000 pound	2,448.33
Removal of contaminated pump motor, >10,000 pound	5,506.42
Removal of contaminated heat exchanger <3000 pound	3,633.65
Removal of contaminated heat exchanger >3000 pound	10,651.33
Removal of contaminated tank, <300 gallons	1,414.74
Removal of contaminated tank, >300 gallons, $/square foot	26.71
Removal of contaminated electrical equipment, <300 pound	647.22
Removal of contaminated electrical equipment, 300-1000 pound	1,529.29
Removal of contaminated electrical equipment, 1000-10,000 pound	2,950.99
Removal of contaminated electrical equipment, >10,000 pound	5,905.31
Removal of contaminated electrical cable tray, $/linear foot	31.43
Removal of contaminated electrical conduit, $/linear foot	16.40
Removal of contaminated mechanical equipment, <300 pound	720.57
Removal of contaminated mechanical equipment, 300-1000 pound	1,707.41
Removal of contaminated mechanical equipment, 1000-10,000 pound	3,288.11
Removal of contaminated mechanical equipment, >10,000 pound	5,905.31
Removal of contaminated HVAC equipment, <300 pound	720.57
Removal of contaminated HVAC equipment, 300-1000 pound	1,707.41
Removal of contaminated HVAC equipment, 1000-10,000 pound	3,288.11

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APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of contaminated HVAC equipment, >10,000 pound	5,905.31
Removal of contaminated HVAC ductwork, $/pound	2.06
Removal/plasma arc cut of contaminated thin metal components, $/linear in.	3.36
Additional decontamination of surface by washing, $/square foot	7.22
Additional decontamination of surfaces by hydrolasing, $/square foot	30.04
Decontamination rig hook up and flush, $/ 250 foot length	6,028.10
Chemical flush of components/systems, $/gallon	22.65
Removal of clean standard reinforced concrete, $/cubic yard	74.81
Removal of grade slab concrete, $/cubic yard	85.05
Removal of clean concrete floors, $/cubic yard	383.35
Removal of sections of clean concrete floors, $/cubic yard	1,105.52
Removal of clean heavily rein concrete w/#9 rebar, $/cubic yard	107.87
Removal of contaminated heavily rein concrete w/#9 rebar, $/cubic yard	1,946.22
Removal of clean heavily rein concrete w/#18 rebar, $/cubic yard	146.16
Removal of contaminated heavily rein concrete w/#18 rebar, $/cubic yard	2,569.71
Removal heavily rein concrete w/#18 rebar & steel embedments, $/cubic yard	454.02
Removal of below-grade suspended floors, $/cubic yard	204.85
Removal of clean monolithic concrete structures, $/cubic yard	899.21
Removal of contaminated monolithic concrete structures, $/cubic yard	1,928.26
Removal of clean foundation concrete, $/cubic yard	709.84
Removal of contaminated foundation concrete, $/cubic yard	1,795.54
Explosive demolition of bulk concrete, $/cubic yard	49.28
Removal of clean hollow masonry block wall, $/cubic yard	25.75
Removal of contaminated hollow masonry block wall, $/cubic yard	60.63
Removal of clean solid masonry block wall, $/cubic yard	25.75
Removal of contaminated solid masonry block wall, $/cubic yard	60.63
Backfill of below-grade voids, $/cubic yard	33.88
Removal of subterranean tunnels/voids, $/linear foot	108.41
Placement of concrete for below-grade voids, $/cubic yard	158.63
Excavation of clean material, $/cubic yard	3.15

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APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Excavation of contaminated material, $/cubic yard	37.85
Removal of clean concrete rubble (tipping fee included), $/cubic yard	27.25
Removal of contaminated concrete rubble, $/cubic yard	23.56
Removal of building by volume, $/cubic foot	0.31
Removal of clean building metal siding, $/square foot	1.31
Removal of contaminated building metal siding, $/square foot	4.29
Removal of standard asphalt roofing, $/square foot	2.02
Removal of transite panels, $/square foot	2.01
Scarifying contaminated concrete surfaces (drill & spall), $/square foot	11.80
Scabbling contaminated concrete floors, $/square foot	6.95
Scabbling contaminated concrete walls, $/square foot	18.38
Scabbling contaminated ceilings, $/square foot	62.79
Scabbling structural steel, $/square foot	5.75
Removal of clean overhead crane/monorail < 10 ton capacity	566.45
Removal of contaminated overhead crane/monorail < 10 ton capacity	1,588.80
Removal of clean overhead crane/monorail >10-50 ton capacity	1,359.51
Removal of contaminated overhead crane/monorail >10-50 ton capacity	3,811.23
Removal of polar crane > 50 ton capacity	5,798.24
Removal of gantry crane > 50 ton capacity	24,329.17
Removal of structural steel, $/pound	0.19
Removal of clean steel floor grating, $/square foot	4.37
Removal of contaminated steel floor grating, $/square foot	11.96
Removal of clean free standing steel liner, $/square foot	11.06
Removal of contaminated free standing steel liner, $/square foot	30.91
Removal of clean concrete-anchored steel liner, $/square foot	5.53
Removal of contaminated concrete-anchored steel liner, $/square foot	35.92
Placement of scaffolding in clean areas, $/square foot	16.73
Placement of scaffolding in contaminated areas, $/square foot	25.68
Landscaping with topsoil, $/acre	25,777.07
Cost of CPC B-88 LSA box & preparation for use	2,229.67

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APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Cost of CPC B-25 LSA box & preparation for use	2,098.37
Cost of CPC B-12V 12 gauge LSA box & preparation for use	1,661.13
Cost of CPC B-144 LSA box & preparation for use	11,431.48
Cost of LSA drum & preparation for use	225.23
Cost of cask liner for CNSI 8 120A cask (resins)	13,140.46
Cost of cask liner for CNSI 8 120A cask (filters)	9,391.53
Decontamination of surfaces with vacuuming, $/square foot	0.80

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APPENDIX C

DETAILED COST ANALYSIS

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Table C
Crystal River Unit 3 Nuclear Generating Plant
SAFSTOR Decommissioning Cost Estimate with Dry Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
SAFSTOR I																					
Period 0a Additional Costs																					
0a 2 1	2018 -2019 SAFSTOR I Nuc Protective Services	-	-	-	-	-	-	13,864	-	13,864	-	13,864	-	-	-	-	-	-	-	-	-
0a 2 2	2018 - 2019 SAFSTOR I Radiological D&D	-	-	-	-	-	-	12,264	-	12,264	12,264	-	-	-	-	-	-	-	-	-	-
0a 2 3	2018 - 2019 SAFSTOR I Spent Fuel Activities	-	-	-	-	-	-	14,006	-	14,006	-	14,006	-	-	-	-	-	-	-	-	-
0a 2 4	2018 - 2019 SAFSTOR I Site Restoration/EWF	-	-	-	-	-	-	388	-	388	-	-	388	-	-	-	-	-	-	-	-
0a 2 5	2018 - 2019 SAFSTOR I Emergent Work Fund	-	-	-	-	-	-	12,545	-	12,545	12,545	-	-	-	-	-	-	-	-	-	-
0a 2 6	2018 - 2019 SAFSTOR I Insurance & Taxes	-	-	-	-	-	-	(1,051)	-	(1,051)	(1,051)	-	-	-	-	-	-	-	-	-	-
0a 2 7	2018 Severance (contingency)	-	-	-	-	-	-	3,500	-	3,500	3,500	-	-	-	-	-	-	-	-	-	-
0a 2 8	2018 Loading Campaign	-	-	-	-	-	-	4,526	-	4,526	-	4,526	-	-	-	-	-	-	-	-	-
0a 2 9	2018 Spent Fuel Litigation	-	-	-	-	-	-	820	-	820	-	820	-	-	-	-	-	-	-	-	-
0a 0	TOTAL PERIOD 0a COST	-	-	-	-	-	-	60,862	-	60,862	27,258	33,216	388	-	-	-	-	-	-	-	224,840
SAFSTOR II																					
Period 0b Additional Costs																					
0b 2 1	2019 SAFSTOR II Nuc Protective Services	-	-	-	-	-	-	1,390	-	1,390	-	1,390	-	-	-	-	-	-	-	-	-
0b 2 2	2019 SAFSTOR II Radiological D&D	-	-	-	-	-	-	2,379	-	2,379	2,379	-	-	-	-	-	-	-	-	-	-
0b 2 3	2019 SAFSTOR II Spent Fuel Activities	-	-	-	-	-	-	1,707	-	1,707	-	1,707	-	-	-	-	-	-	-	-	-
0b 2 4	2019 SAFSTOR II Site Restoration/EWF	-	-	-	-	-	-	46	-	46	-	-	46	-	-	-	-	-	-	-	-
0b 2 5	2019 SAFSTOR II Emergent Work Fund	-	-	-	-	-	-	160	-	160	160	-	-	-	-	-	-	-	-	-	-
0b 2 6	2019 SAFSTOR II Insurance & Taxes	-	-	-	-	-	-	(2,029)	-	(2,029)	(2,029)	-	-	-	-	-	-	-	-	-	-
0b 2 7	Period 0b credit to remove 0b 1 1 SAFSTOR Char Survey	-	-	-	-	-	-	(522)	(157)	(679)	(679)	-	-	-	-	-	-	-	-	-	-
0b 2 8	Period 0b credit to remove 0b Engineering cost	-	-	-	-	-	-	(5,661)	(849)	(6,510)	(6,510)	-	-	-	-	-	-	-	-	-	(44,390)
0b 2 9	2019 disposal cost (detector/trolley girder)	-	-	-	-	-	-	350	-	350	350	-	-	-	-	-	-	-	-	-	-
0b 2	Subtotal Period 0b Additional Costs	-	-	-	-	-	-	(2,180)	(1,006)	(3,186)	(6,329)	3,097	46	-	-	-	-	-	-	-	(44,390)
0b 0	TOTAL PERIOD 0b COST	-	-	-	-	-	-	4,004	0	4,004	861	3,097	46	-	-	-	-	-	-	-	17,523
PERIOD TOTALS		-	-	-	-	-	-	64,866	0	64,866	28,119	36,313	434	-	-	-	-	-	-	-	242,363
PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage																					
Period 2b Direct Decommissioning Activities																					
2b 1 1	Quarterly Inspection									a											
2b 1 2	Semi-annual environmental survey									a											
2b 1 3	Prepare reports									a											
2b 1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Period 2b Additional Costs																					
2b 2 1	Insurance Credits	-	-	-	-	-	-	(22,868)	-	(22,868)	(22,868)	-	-	-	-	-	-	-	-	-	-
2b 2 2	Spent Fuel Litigation	-	-	-	-	-	-	492	-	492	-	492	-	-	-	-	-	-	-	-	-
2b 2	Subtotal Period 2b Additional Costs	-	-	-	-	-	-	(22,376)	-	(22,376)	(22,868)	492	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b 3 1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	4,328	649	4,978	-	4,978	-	-	-	-	-	-	-	-	-
2b 3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	4,328	649	4,978	-	4,978	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b 4 1	Insurance	-	-	-	-	-	-	7,272	727	7,999	7,999	-	-	-	-	-	-	-	-	-	-
2b 4 2	Property taxes	-	-	-	-	-	-	7,669	-	7,669	7,669	-	-	-	-	-	-	-	-	-	-
2b 4 3	Health physics supplies	-	1,940	-	-	-	-	-	485	2,425	2,425	-	-	-	-	-	-	-	-	-	-
2b 4 4	Disposal of DAW generated	-	-	51	11	-	113	-	35	210	210	-	-	-	2,186	-	-	-	43,724	71	-
2b 4 5	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2b 4 6	Non-Labor Reoccuring	-	-	-	-	-	-	26,557	3,984	30,540	23,577	6,963	-	-	-	-	-	-	-	-	-
2b 4 7	ISFSI Operating Costs	-	-	-	-	-	-	1,837	276	2,113	-	2,113	-	-	-	-	-	-	-	-	-
2b 4 8	Florida LLRW Inspection Fee	-	-	-	-	-	-	4	1	5	5	-	-	-	-	-	-	-	-	-	-
2b 4 9	Corporate A&G	-	-	-	-	-	-	10,800	1,620	12,420	12,420	-	-	-	-	-	-	-	-	-	-
2b 4 10	Security Staff Cost	-	-	-	-	-	-	55,469	8,320	63,789	32,277	31,512	-	-	-	-	-	-	-	-	1,049,118
2b 4 11	Utility Staff Cost	-	-	-	-	-	-	71,193	10,679	81,872	69,182	12,690	-	-	-	-	-	-	-	-	936,712
2b 4	Subtotal Period 2b Period-Dependent Costs	-	1,940	51	11	-	113	180,801	26,126	209,042	155,763	53,278	-	-	2,186	-	-	-	43,724	71	1,985,830
2b 0	TOTAL PERIOD 2b COST	-	1,940	51	11	-	113	162,753	26,775	191,643	132,896	58,748	-	-	2,186	-	-	-	43,724	71	1,985,830

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Table C
Crystal River Unit 3 Nuclear Generating Plant
SAFSTOR Decommissioning Cost Estimate with Dry Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c 1 1	Quarterly Inspection									a											
2c 1 2	Semi-annual environmental survey									a											
2c 1 3	Prepare reports									a											
2c 1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Period 2c Additional Costs																					
2c 2 1	Insurance Credits	-	-	-	-	-	-	(32,491)	-	(32,491)	(32,491)	-	-	-	-	-	-	-	-	-	-
2c 2 3	Spent Fuel Litigation	-	-	-	-	-	-	82	-	82	-	82	-	-	-	-	-	-	-	-	-
2c 2	Subtotal Period 2c Additional Costs	-	-	-	-	-	-	(32,409)	-	(32,409)	(32,491)	82	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c 4 1	Insurance	-	-	-	-	-	-	9,299	930	10,229	10,229	-	-	-	-	-	-	-	-	-	-
2c 4 2	Property taxes	-	-	-	-	-	-	12,519	-	12,519	12,519	-	-	-	-	-	-	-	-	-	-
2c 4 3	Health physics supplies	-	2,774	-	-	-	-	-	694	3,468	3,468	-	-	-	-	-	-	-	-	-	-
2c 4 4	Disposal of DAW generated	-	-	70	15	-	154	-	48	287	287	-	-	-	2,993	-	-	-	59,869	98	-
2c 4 5	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2c 4 6	Non-Labor Reoccuring	-	-	-	-	-	-	43,360	6,504	49,864	49,864	-	-	-	-	-	-	-	-	-	-
2c 4 7	Florida LLRW Inspection Fee	-	-	-	-	-	-	6	1	7	7	-	-	-	-	-	-	-	-	-	-
2c 4 8	Corporate A&G	-	-	-	-	-	-	8,885	1,333	10,218	10,218	-	-	-	-	-	-	-	-	-	-
2c 4 9	Security Staff Cost	-	-	-	-	-	-	22,378	3,357	25,735	25,735	-	-	-	-	-	-	-	-	-	917,537
2c 4 10	Utility Staff Cost	-	-	-	-	-	-	31,359	4,704	36,062	36,062	-	-	-	-	-	-	-	-	-	535,230
2c 4	Subtotal Period 2c Period-Dependent Costs	-	2,774	70	15	-	154	127,805	17,569	148,389	148,389	-	-	-	2,993	-	-	-	59,869	98	1,452,766
2c 0	TOTAL PERIOD 2c COST	-	2,774	70	15	-	154	95,397	17,569	115,980	115,898	82	-	-	2,993	-	-	-	59,869	98	1,452,766
PERIOD 2 TOTALS		-	4,714	121	27	-	267	258,150	44,345	307,623	248,794	58,830	-	-	5,180	-	-	-	103,593	169	3,438,597
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a 1 1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	166	25	191	191	-	-	-	-	-	-	-	-	-	1,300
3a 1 2	Review plant dwgs & specs	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	4,600
3a 1 3	Perform detailed rad survey									a											
3a 1 4	End product description	-	-	-	-	-	-	128	19	147	147	-	-	-	-	-	-	-	-	-	1,000
3a 1 5	Detailed by-product inventory	-	-	-	-	-	-	166	25	191	191	-	-	-	-	-	-	-	-	-	1,300
3a 1 6	Define major work sequence	-	-	-	-	-	-	956	143	1,100	1,100	-	-	-	-	-	-	-	-	-	7,500
3a 1 7	Perform SER and EA	-	-	-	-	-	-	395	59	455	455	-	-	-	-	-	-	-	-	-	3,100
3a 1 8	Perform Site-Specific Cost Study	-	-	-	-	-	-	638	96	733	733	-	-	-	-	-	-	-	-	-	5,000
Activity Specifications																					
3a 1 9 1	Re-activate plant & temporary facilities	-	-	-	-	-	-	940	141	1,081	973	-	108	-	-	-	-	-	-	-	7,370
3a 1 9 2	Plant systems	-	-	-	-	-	-	531	80	611	550	-	61	-	-	-	-	-	-	-	4,167
3a 1 9 3	Reactor internals	-	-	-	-	-	-	905	136	1,041	1,041	-	-	-	-	-	-	-	-	-	7,100
3a 1 9 4	Reactor vessel	-	-	-	-	-	-	829	124	953	953	-	-	-	-	-	-	-	-	-	6,500
3a 1 9 5	Biological shield	-	-	-	-	-	-	64	10	73	73	-	-	-	-	-	-	-	-	-	500
3a 1 9 6	Steam generators	-	-	-	-	-	-	398	60	458	458	-	-	-	-	-	-	-	-	-	3,120
3a 1 9 7	Reinforced concrete	-	-	-	-	-	-	204	31	235	117	-	117	-	-	-	-	-	-	-	1,600
3a 1 9 8	Main Turbine	-	-	-	-	-	-	51	8	59	-	-	59	-	-	-	-	-	-	-	400
3a 1 9 9	Main Condensers	-	-	-	-	-	-	51	8	59	-	-	59	-	-	-	-	-	-	-	400
3a 1 9 10	Plant structures & buildings	-	-	-	-	-	-	398	60	458	229	-	229	-	-	-	-	-	-	-	3,120
3a 1 9 11	Waste management	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	4,600
3a 1 9 12	Facility & site closeout	-	-	-	-	-	-	115	17	132	66	-	66	-	-	-	-	-	-	-	900
3a 1 9	Total	-	-	-	-	-	-	5,073	761	5,834	5,135	-	699	-	-	-	-	-	-	-	39,777
Planning & Site Preparations																					
3a 1 10	Prepare dismantling sequence	-	-	-	-	-	-	306	46	352	352	-	-	-	-	-	-	-	-	-	2,400
3a 1 11	Plant prep & temp svces	-	-	-	-	-	-	3,200	480	3,680	3,680	-	-	-	-	-	-	-	-	-	-
3a 1 12	Design water clean-up system	-	-	-	-	-	-	179	27	205	205	-	-	-	-	-	-	-	-	-	1,400
3a 1 13	Rigging/Cont Cntrl Envlps/tooling/etc	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
3a 1 14	Procure casks/liners & containers	-	-	-	-	-	-	157	24	180	180	-	-	-	-	-	-	-	-	-	1,230
3a 1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	14,249	2,137	16,387	15,688	-	699	-	-	-	-	-	-	-	68,607
Period 3a Additional Costs																					
3a 2 1	Insurance Credits	-	-	-	-	-	-	(1,105)	-	(1,105)	(1,105)	-	-	-	-	-	-	-	-	-	-
3a 2	Subtotal Period 3a Additional Costs	-	-	-	-	-	-	(1,105)	-	(1,105)	(1,105)	-	-	-	-	-	-	-	-	-	-

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Table C
Crystal River Unit 3 Nuclear Generating Plant
SAFSTOR Decommissioning Cost Estimate with Dry Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3a Period-Dependent Costs																					
3a 4 1	Insurance	-	-	-	-	-	-	316	32	348	348	-	-	-	-	-	-	-	-	-	-
3a 4 2	Property taxes	-	-	-	-	-	-	426	-	426	426	-	-	-	-	-	-	-	-	-	-
3a 4 3	Health physics supplies	-	450	-	-	-	-	-	113	563	563	-	-	-	-	-	-	-	-	-	-
3a 4 4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
3a 4 5	Disposal of DAW generated	-	-	12	3	-	27	-	8	49	49	-	-	-	514	-	-	-	10,287	17	-
3a 4 6	Plant energy budget	-	-	-	-	-	-	1,039	156	1,195	1,195	-	-	-	-	-	-	-	-	-	-
3a 4 7	Non-Labor Reoccuring	-	-	-	-	-	-	1,474	221	1,695	1,695	-	-	-	-	-	-	-	-	-	-
3a 4 8	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
3a 4 9	Corporate A&G	-	-	-	-	-	-	523	78	601	601	-	-	-	-	-	-	-	-	-	-
3a 4 10	Security Staff Cost	-	-	-	-	-	-	1,480	222	1,702	1,702	-	-	-	-	-	-	-	-	-	65,000
3a 4 11	Utility Staff Cost	-	-	-	-	-	-	15,629	2,344	17,974	17,974	-	-	-	-	-	-	-	-	-	257,920
3a 4	Subtotal Period 3a Period-Dependent Costs	-	1,018	12	3	-	27	20,888	3,259	25,206	25,206	-	-	-	514	-	-	-	10,287	17	322,920
3a 0	TOTAL PERIOD 3a COST	-	1,018	12	3	-	27	34,032	5,397	40,488	39,789	-	699	-	514	-	-	-	10,287	17	391,527
PERIOD 3b - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b 1 1 1	Plant systems	-	-	-	-	-	-	604	91	694	625	-	69	-	-	-	-	-	-	-	4,733
3b 1 1 2	Reactor internals	-	-	-	-	-	-	319	48	367	367	-	-	-	-	-	-	-	-	-	2,500
3b 1 1 3	Remaining buildings	-	-	-	-	-	-	172	26	198	49	-	148	-	-	-	-	-	-	-	1,350
3b 1 1 4	CRD cooling assembly	-	-	-	-	-	-	128	19	147	147	-	-	-	-	-	-	-	-	-	1,000
3b 1 1 5	CRD housings & ICI tubes	-	-	-	-	-	-	128	19	147	147	-	-	-	-	-	-	-	-	-	1,000
3b 1 1 6	Incore instrumentation	-	-	-	-	-	-	128	19	147	147	-	-	-	-	-	-	-	-	-	1,000
3b 1 1 7	Reactor vessel	-	-	-	-	-	-	463	69	532	532	-	-	-	-	-	-	-	-	-	3,630
3b 1 1 8	Facility closeout	-	-	-	-	-	-	153	23	176	88	-	88	-	-	-	-	-	-	-	1,200
3b 1 1 9	Missile shields	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	450
3b 1 1 10	Biological shield	-	-	-	-	-	-	153	23	176	176	-	-	-	-	-	-	-	-	-	1,200
3b 1 1 11	Steam generators	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	4,600
3b 1 1 12	Reinforced concrete	-	-	-	-	-	-	128	19	147	73	-	73	-	-	-	-	-	-	-	1,000
3b 1 1 13	Main Turbine	-	-	-	-	-	-	199	30	229	-	-	229	-	-	-	-	-	-	-	1,560
3b 1 1 14	Main Condensers	-	-	-	-	-	-	199	30	229	-	-	229	-	-	-	-	-	-	-	1,560
3b 1 1 15	Auxiliary building	-	-	-	-	-	-	348	52	400	360	-	40	-	-	-	-	-	-	-	2,730
3b 1 1 16	Reactor building	-	-	-	-	-	-	348	52	400	360	-	40	-	-	-	-	-	-	-	2,730
3b 1 1	Total	-	-	-	-	-	-	4,112	617	4,729	3,812	-	917	-	-	-	-	-	-	-	32,243
3b 1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	4,112	617	4,729	3,812	-	917	-	-	-	-	-	-	-	32,243
Period 3b Additional Costs																					
3b 2 1	Site Characterization	-	-	-	-	-	-	6,854	2,056	8,911	8,911	-	-	-	-	-	-	-	-	30,500	10,852
3b 2 2	Hazardous/Mixed Waste	-	-	-	-	-	-	150	23	173	173	-	-	-	-	-	-	-	-	-	-
3b 2 3	Insurance Credits	-	-	-	-	-	-	(636)	-	(636)	(636)	-	-	-	-	-	-	-	-	-	-
3b 2	Subtotal Period 3b Additional Costs	-	-	-	-	-	-	6,368	2,079	8,447	8,447	-	-	-	-	-	-	-	-	30,500	10,852
Period 3b Collateral Costs																					
3b 3 1	Decon equipment	974	-	-	-	-	-	-	146	1,120	1,120	-	-	-	-	-	-	-	-	-	-
3b 3 2	DOC staff relocation expenses	-	-	-	-	-	-	1,474	221	1,695	1,695	-	-	-	-	-	-	-	-	-	-
3b 3 3	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
3b 3	Subtotal Period 3b Collateral Costs	974	1,100	-	-	-	-	1,474	532	4,081	4,081	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b 4 1	Decon supplies	35	-	-	-	-	-	-	9	43	43	-	-	-	-	-	-	-	-	-	-
3b 4 2	Insurance	-	-	-	-	-	-	202	20	223	223	-	-	-	-	-	-	-	-	-	-
3b 4 3	Property taxes	-	-	-	-	-	-	213	-	213	213	-	-	-	-	-	-	-	-	-	-
3b 4 4	Health physics supplies	-	249	-	-	-	-	-	62	311	311	-	-	-	-	-	-	-	-	-	-
3b 4 5	Heavy equipment rental	-	284	-	-	-	-	-	43	327	327	-	-	-	-	-	-	-	-	-	-
3b 4 6	Disposal of DAW generated	-	-	7	2	-	15	-	5	28	28	-	-	-	292	-	-	-	5,834	10	-
3b 4 7	Plant energy budget	-	-	-	-	-	-	521	78	599	599	-	-	-	-	-	-	-	-	-	-
3b 4 8	Non-Labor Reoccuring	-	-	-	-	-	-	738	111	848	848	-	-	-	-	-	-	-	-	-	-
3b 4 9	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
3b 4 10	Corporate A&G	-	-	-	-	-	-	300	45	345	345	-	-	-	-	-	-	-	-	-	-
3b 4 11	Security Staff Cost	-	-	-	-	-	-	742	111	853	853	-	-	-	-	-	-	-	-	-	32,589
3b 4 12	DOC Staff Cost	-	-	-	-	-	-	5,309	796	6,105	6,105	-	-	-	-	-	-	-	-	-	58,400
3b 4 13	Utility Staff Cost	-	-	-	-	-	-	7,836	1,175	9,011	9,011	-	-	-	-	-	-	-	-	-	129,313
3b 4	Subtotal Period 3b Period-Dependent Costs	35	533	7	2	-	15	15,862	2,455	18,908	18,908	-	-	-	292	-	-	-	5,834	10	220,302

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Table C
Crystal River Unit 3 Nuclear Generating Plant
SAFSTOR Decommissioning Cost Estimate with Dry Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
3b 0	TOTAL PERIOD 3b COST	1,009	1,633	7	2	-	15	27,816	5,683	36,164	35,247	-	917	-	292	-	-	-	5,834	30,510	263,397
PERIOD 3 TOTALS		1,009	2,651	19	4	-	42	61,848	11,080	76,652	75,036	-	1,616	-	806	-	-	-	16,121	30,526	654,924
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a 1 1 1	Reactor Coolant Piping	31	118	44	64	33	471	-	182	941	941	-	-	188	1,791	-	-	-	137,454	2,799	-
4a 1 1 2	Pressurizer Relief Tank	4	14	7	11	5	78	-	28	147	147	-	-	31	298	-	-	-	22,882	345	-
4a 1 1 3	Reactor Coolant Pumps & Motors	26	83	75	210	-	1,448	-	435	2,277	2,277	-	-	-	4,664	-	-	-	840,400	2,568	80
4a 1 1 4	Pressurizer	9	50	433	179	-	899	-	312	1,881	1,881	-	-	-	2,897	-	-	-	341,500	1,505	1,500
4a 1 1 5	Steam Generators	43	5,235	2,445	3,124	-	6,882	-	3,764	21,493	21,493	-	-	-	22,172	-	-	-	1,889,167	8,838	4,500
4a 1 1 6	CRDMs/ICIs/Service Structure Removal	35	268	295	86	40	581	-	278	1,584	1,584	-	-	419	3,500	-	-	-	169,622	5,721	-
4a 1 1 7	Reactor Vessel Internals	63	6,467	6,944	1,036	-	17,280	347	15,569	47,707	47,707	-	-	-	2,192	1,252	462	-	286,446	29,140	1,324
4a 1 1 8	Vessel & Internals GTCC Disposal	-	-	-	-	-	7,162	-	1,074	8,237	8,237	-	-	-	-	-	-	1,649	332,892	-	-
4a 1 1 9	Reactor Vessel	92	7,848	2,556	1,993	-	4,684	347	9,463	26,983	26,983	-	-	-	14,096	-	-	-	991,628	29,140	1,324
4a 1 1	Totals	303	20,082	12,798	6,702	78	39,487	694	31,105	111,249	111,249	-	-	638	51,610	1,252	462	1,649	5,011,990	80,057	8,728
Removal of Major Equipment																					
4a 1 2	Main Turbine/Generator	-	274	23	5	116	-	-	89	507	507	-	-	991	-	-	-	-	44,602	5,478	-
4a 1 3	Main Condensers	-	851	54	12	271	-	-	261	1,449	1,449	-	-	2,316	-	-	-	-	104,240	17,268	-
Cascading Costs from Clean Building Demolition																					
4a 1 4 1	Reactor	-	393	-	-	-	-	-	59	452	452	-	-	-	-	-	-	-	-	3,499	-
4a 1 4 2	Auxiliary Building	-	101	-	-	-	-	-	15	116	116	-	-	-	-	-	-	-	-	829	-
4a 1 4 3	Intermediate Bldg	-	25	-	-	-	-	-	4	29	29	-	-	-	-	-	-	-	-	134	-
4a 1 4 4	Machine Shop - Hot	-	2	-	-	-	-	-	0	3	3	-	-	-	-	-	-	-	-	23	-
4a 1 4 5	RM Warehouse	-	1	-	-	-	-	-	0	1	1	-	-	-	-	-	-	-	-	3	-
4a 1 4 6	z Fuel Handling Area (Aux Bldg)	-	60	-	-	-	-	-	9	69	69	-	-	-	-	-	-	-	-	455	-
4a 1 4	Totals	-	581	-	-	-	-	-	87	668	668	-	-	-	-	-	-	-	-	4,941	-
Disposal of Plant Systems																					
4a 1 5 1	Auxiliary Steam	-	63	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	-	1,391	-
4a 1 5 2	Auxiliary Steam - RCA	-	38	1	2	40	-	-	16	95	95	-	-	376	-	-	-	-	15,255	605	-
4a 1 5 3	Chemical Addition - Cont	-	68	1	3	63	-	-	27	162	162	-	-	596	-	-	-	-	24,217	1,127	-
4a 1 5 4	Chemical Addition - Cont - Insulated	-	11	0	0	6	-	-	4	21	21	-	-	61	-	-	-	-	2,461	159	-
4a 1 5 5	Chemical Addition - Insulated - RCA	-	9	0	0	6	-	-	3	19	19	-	-	61	-	-	-	-	2,461	124	-
4a 1 5 6	Chemical Addition - RCA	-	58	1	3	69	-	-	25	157	157	-	-	658	-	-	-	-	26,704	903	-
4a 1 5 7	Chemical Feed Secondary Cycle	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	331	-
4a 1 5 8	Chemical Feed Secondary Cycle - RCA	-	8	0	0	5	-	-	3	16	16	-	-	51	-	-	-	-	2,067	107	-
4a 1 5 9	Chilled Water	-	69	-	-	-	-	-	10	79	-	-	79	-	-	-	-	-	-	1,520	-
4a 1 5 10	Chilled Water - RCA	-	79	1	3	71	-	-	31	185	185	-	-	672	-	-	-	-	27,273	1,225	-
4a 1 5 11	Circulating Water	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,730	-
4a 1 5 12	Cond Demin Regeneration	-	49	-	-	-	-	-	7	56	-	-	56	-	-	-	-	-	-	1,049	-
4a 1 5 13	Condensate	-	128	-	-	-	-	-	19	147	-	-	147	-	-	-	-	-	-	2,868	-
4a 1 5 14	Condensate & Demin Water Supply	-	28	-	-	-	-	-	4	32	-	-	32	-	-	-	-	-	-	606	-
4a 1 5 15	Condensate & Demin Water Supply - Cont	-	79	1	2	51	-	-	28	160	160	-	-	483	-	-	-	-	19,601	1,284	-
4a 1 5 16	Condensate & Demin Water Supply - RCA	-	116	2	4	92	-	-	44	257	257	-	-	875	-	-	-	-	35,538	1,773	-
4a 1 5 17	Condensate - Cont	-	191	6	15	342	-	-	102	656	656	-	-	3,236	-	-	-	-	131,415	3,586	-
4a 1 5 18	Condensate Demineralizer	-	112	-	-	-	-	-	17	129	-	-	129	-	-	-	-	-	-	2,482	-
4a 1 5 19	Condensate Demineralizer - Cont	-	165	3	8	169	-	-	68	413	413	-	-	1,604	-	-	-	-	65,131	2,800	-
4a 1 5 20	Condenser Air Removal & Priming	-	104	-	-	-	-	-	16	120	-	-	120	-	-	-	-	-	-	2,308	-
4a 1 5 21	Cycle Makeup Demin Water	-	69	-	-	-	-	-	10	79	-	-	79	-	-	-	-	-	-	1,472	-
4a 1 5 22	Cycle Makeup Demin Water - RCA	-	74	1	2	54	-	-	27	159	159	-	-	513	-	-	-	-	20,841	1,125	-
4a 1 5 23	Cycle Startup	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	222	-
4a 1 5 24	Cycle Startup - RCA	-	24	1	2	46	-	-	13	86	86	-	-	431	-	-	-	-	17,510	401	-
4a 1 5 25	Diesel Jacket Coolant	-	29	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	613	-
4a 1 5 26	Diesel-Air Cooler Coolant	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	108	-
4a 1 5 27	EDG FO & Compressed Air & Exhaust	-	48	-	-	-	-	-	7	55	-	-	55	-	-	-	-	-	-	1,028	-
4a 1 5 28	EDG Lube Oil	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	111	-
4a 1 5 29	EFP-3 Compressed and Starting Air	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	302	-
4a 1 5 30	EFP-3 Fuel Oil Transfer	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	444	-
4a 1 5 31	EFPB Sump Discharge	-	9	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	225	-
4a 1 5 32	Emergency Feedwater	-	78	-	-	-	-	-	12	89	-	-	89	-	-	-	-	-	-	1,668	-
4a 1 5 33	Emergency Feedwater - RCA	-	151	3	8	173	-	-	65	400	400	-	-	1,640	-	-	-	-	66,593	2,413	-
4a 1 5 34	Extraction Steam	-	130	-	-	-	-	-	19	149	-	-	149	-	-	-	-	-	-	2,916	-

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Table C
Crystal River Unit 3 Nuclear Generating Plant
SAFSTOR Decommissioning Cost Estimate with Dry Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Disposal of Plant Systems (continued)																					
4a 1 5 35	FW Heater Relief Vents & Drains	-	56	-	-	-	-	-	8	65	-	-	65	-	-	-	-	-	-	1,225	-
4a 1 5 36	FW Heater Relief Vents & Drains - Cont	-	70	1	2	39	-	-	24	135	135	-	-	366	-	-	-	-	14,864	1,187	-
4a 1 5 37	Feedwater	-	97	-	-	-	-	-	15	112	-	-	112	-	-	-	-	-	-	2,106	-
4a 1 5 38	Feedwater - Insulated	-	53	-	-	-	-	-	8	61	-	-	61	-	-	-	-	-	-	1,222	-
4a 1 5 39	Feedwater - Insulated - RCA	-	119	4	11	242	-	-	68	444	444	-	-	2,293	-	-	-	-	93,138	1,961	-
4a 1 5 40	Feedwater - RCA	-	28	1	3	60	-	-	17	109	109	-	-	572	-	-	-	-	23,243	453	-
4a 1 5 41	HVAC-Misc Outbldgs	-	19	-	-	-	-	-	3	22	-	-	22	-	-	-	-	-	-	469	-
4a 1 5 42	LP & HP Feedwater Drains & Vents	-	227	-	-	-	-	-	34	261	-	-	261	-	-	-	-	-	-	5,048	-
4a 1 5 43	LP & HP Feedwater Drains & Vents - Cont	-	258	4	11	248	-	-	104	624	624	-	-	2,346	-	-	-	-	95,269	4,444	-
4a 1 5 44	Liquid Sampling - Cont	-	82	1	1	33	-	-	26	143	143	-	-	313	-	-	-	-	12,721	1,396	-
4a 1 5 45	Liquid Sampling - RCA	-	68	1	2	36	-	-	23	129	129	-	-	336	-	-	-	-	13,655	1,100	-
4a 1 5 46	Lube Oil	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	256	-
4a 1 5 47	Main & Reheat Steam	-	99	-	-	-	-	-	15	114	-	-	114	-	-	-	-	-	-	2,230	-
4a 1 5 48	Main & Reheat Steam - Cont	-	654	61	162	3,641	-	-	740	5,258	5,258	-	-	34,481	-	-	-	-	1,400,277	12,031	-
4a 1 5 49	Main & Reheat Steam - RCA	-	17	0	1	24	-	-	8	51	51	-	-	226	-	-	-	-	9,182	279	-
4a 1 5 50	Misc Turbine Room Steam Drains	-	57	-	-	-	-	-	9	66	-	-	66	-	-	-	-	-	-	1,332	-
4a 1 5 51	Misc Turbine Room Steam Drains - Cont	-	239	2	7	148	-	-	83	480	480	-	-	1,405	-	-	-	-	57,049	3,733	-
4a 1 5 52	Nitrogen/Hydrogen/Carbon Dioxide	-	32	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	736	-
4a 1 5 53	Nuc Serv & Decay Heat Sea Water	-	53	-	-	-	-	-	8	61	-	-	61	-	-	-	-	-	-	1,172	-
4a 1 5 54	Nuc Serv & Decay Heat Sea Water - Cont	-	78	7	18	395	-	-	82	580	580	-	-	3,740	-	-	-	-	151,890	1,438	-
4a 1 5 55	Nuc Serv & Decay Heat Sea Water - RCA	-	86	5	12	264	-	-	63	430	430	-	-	2,504	-	-	-	-	101,697	1,455	-
4a 1 5 56	RC & Misc Waste Evaporator	-	421	23	41	641	110	-	238	1,475	1,475	-	-	6,075	454	-	-	-	275,981	7,957	-
4a 1 5 57	RC & Misc Waste Evaporator - Insulated	-	43	5	4	7	34	-	21	113	113	-	-	62	135	-	-	-	11,400	636	-
4a 1 5 58	Screen Wash Water	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	989	-
4a 1 5 59	Seal & Spray Water	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	99	-
4a 1 5 60	Seal & Spray Water - Cont	-	118	1	4	86	-	-	43	252	252	-	-	814	-	-	-	-	33,044	1,877	-
4a 1 5 61	Seal & Spray Water - RCA	-	93	1	4	83	-	-	36	217	217	-	-	783	-	-	-	-	31,811	1,379	-
4a 1 5 62	Secondary Cycle Sampling	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	622	-
4a 1 5 63	Secondary Cycle Sampling - Cont	-	11	0	0	6	-	-	4	22	22	-	-	60	-	-	-	-	2,419	169	-
4a 1 5 64	Secondary Cycle Sampling - Cont - Ins	-	4	0	0	2	-	-	1	7	7	-	-	20	-	-	-	-	810	57	-
4a 1 5 65	Secondary Cycle Sampling - Insulated	-	7	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	180	-
4a 1 5 66	Secondary Serv Closed Cycle Cooling	-	224	-	-	-	-	-	34	258	-	-	258	-	-	-	-	-	-	4,978	-
4a 1 5 67	Turb Bldg Sump & Oily Water Separator	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	491	-
4a 1 5 68	Turbine Generator Seal Oil	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	621	-
4a 1 5 69	Turbine Gland Steam & Drains	-	18	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	391	-
4a 1 5 70	Turbine Lube Oil	-	52	-	-	-	-	-	8	60	-	-	60	-	-	-	-	-	-	1,107	-
4a 1 5 71	Waste Drumming	-	18	2	2	3	14	-	9	48	48	-	-	26	57	-	-	-	4,824	269	-
4a 1 5 72	Waste Gas Disposal	-	315	26	29	251	166	-	165	950	950	-	-	2,374	674	-	-	-	140,337	5,335	-
4a 1 5	Totals	-	5,985	166	365	7,397	324	-	2,539	16,774	14,253	-	2,522	70,051	1,321	-	-	-	2,930,676	113,453	-
4a 1 6	Scaffolding in support of decommissioning	-	1,130	20	6	92	17	-	303	1,568	1,568	-	-	784	69	-	-	-	39,683	25,120	-
4a 1	Subtotal Period 4a Activity Costs	303	28,903	13,061	7,091	7,954	39,827	694	34,383	132,215	129,693	-	2,522	74,781	53,000	1,252	462	1,649	8,131,191	246,318	8,728
Period 4a Additional Costs																					
4a 2 1	Remedial Action Surveys	-	-	-	-	-	-	2,304	691	2,995	2,995	-	-	-	-	-	-	-	-	33,144	-
4a 2 2	Asbestos Abatement	-	-	-	-	-	-	100	25	125	125	-	-	-	-	-	-	-	-	-	-
4a 2 3	Remove Contaminated Outdoor Piping	-	162	27	49	-	303	-	126	669	669	-	-	-	1,239	-	-	-	37,866	2,621	-
4a 2 4	Lead Abatement Crew	-	960	-	-	-	-	-	240	1,200	1,200	-	-	-	-	-	-	-	-	19,900	-
4a 2 5	Insurance Credits	-	-	-	-	-	-	(2,024)	-	(2,024)	(2,024)	-	-	-	-	-	-	-	-	-	-
4a 2 6	Fuel Bearing Waste	-	-	-	57	-	75	-	-	132	132	-	-	-	-	-	-	5	300	-	-
4a 2	Subtotal Period 4a Additional Costs	-	1,122	27	106	-	378	379	1,083	3,096	3,096	-	-	-	1,239	-	-	5	38,166	55,665	-
Period 4a Collateral Costs																					
4a 3 1	Process decommissioning water waste	3	-	5	20	-	21	-	10	58	58	-	-	-	47	-	-	-	2,799	9	-
4a 3 3	Small tool allowance	-	262	-	-	-	-	-	39	301	271	-	30	-	-	-	-	-	-	-	-
4a 3	Subtotal Period 4a Collateral Costs	3	262	5	20	-	21	-	49	359	329	-	30	-	47	-	-	-	2,799	9	-
Period 4a Period-Dependent Costs																					
4a 4 1	Decon supplies	110	-	-	-	-	-	-	28	138	138	-	-	-	-	-	-	-	-	-	-
4a 4 2	Insurance	-	-	-	-	-	-	644	64	708	708	-	-	-	-	-	-	-	-	-	-
4a 4 3	Property taxes	-	-	-	-	-	-	679	-	679	679	-	-	-	-	-	-	-	-	-	-
4a 4 4	Health physics supplies	-	2,252	-	-	-	-	-	563	2,815	2,815	-	-	-	-	-	-	-	-	-	-
4a 4 5	Heavy equipment rental	-	3,498	-	-	-	-	-	525	4,022	4,022	-	-	-	-	-	-	-	-	-	-
4a 4 6	Disposal of DAW generated	-	-	101	22	-	225	-	70	418	418	-	-	-	4,351	-	-	-	87,016	142	-
4a 4 7	Plant energy budget	-	-	-	-	-	-	1,574	236	1,810	1,810	-	-	-	-	-	-	-	-	-	-
4a 4 8	Non-Labor Reoccuring	-	-	-	-	-	-	2,352	353	2,705	2,705	-	-	-	-	-	-	-	-	-	-

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Table C
Crystal River Unit 3 Nuclear Generating Plant
SAFSTOR Decommissioning Cost Estimate with Dry Fuel Storage
(thousands of 2017 dollars)

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															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 4a Period-Dependent Costs (continued)																					
4a 4 9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	645	97	742	742	-	-	-	-	-	-	-	-	-	-
4a 4 10	Florida LLRW Inspection Fee	-	-	-	-	-	-	264	40	303	303	-	-	-	-	-	-	-	-	-	-
4a 4 11	Corporate A&G	-	-	-	-	-	-	957	143	1,100	1,100	-	-	-	-	-	-	-	-	-	-
4a 4 12	Security Staff Cost	-	-	-	-	-	-	2,360	354	2,714	2,714	-	-	-	-	-	-	-	-	-	103,644
4a 4 13	DOC Staff Cost	-	-	-	-	-	-	20,176	3,026	23,203	23,203	-	-	-	-	-	-	-	-	-	228,846
4a 4 14	Utility Staff Cost	-	-	-	-	-	-	25,125	3,769	28,893	28,893	-	-	-	-	-	-	-	-	-	414,575
4a 4	Subtotal Period 4a Period-Dependent Costs	110	5,750	101	22	-	225	54,774	9,267	70,249	70,249	-	-	-	4,351	-	-	-	87,016	142	747,065
4a 0	TOTAL PERIOD 4a COST	416	36,036	13,195	7,239	7,954	40,450	55,848	44,782	205,919	203,367	-	2,552	74,781	58,637	1,252	462	1,654	8,259,171	302,134	755,793
PERIOD 4b - Site Decontamination																					
Disposal of Plant Systems																					
4b 1 2 1	500 KV Switchyard Components	-	55	-	-	-	-	-	8	63	-	-	63	-	-	-	-	-	-	1,155	-
4b 1 2 2	ACC Diesel Gen	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	369	-
4b 1 2 3	Chemical Cleaning Steam Gen - Cont	-	28	0	1	16	-	-	10	55	55	-	-	151	-	-	-	-	6,141	452	-
4b 1 2 4	Chemical Cleaning Steam Gen - RCA	-	26	0	1	20	-	-	10	57	57	-	-	188	-	-	-	-	7,642	399	-
4b 1 2 5	Containment Monitoring	-	67	1	2	37	-	-	23	129	129	-	-	351	-	-	-	-	14,268	1,068	-
4b 1 2 6	Core Flooding	-	109	2	6	145	-	-	50	313	313	-	-	1,373	-	-	-	-	55,743	1,836	-
4b 1 2 7	Decay Heat Closed Cycle Cooling	-	379	15	41	913	-	-	239	1,588	1,588	-	-	8,651	-	-	-	-	351,308	6,555	-
4b 1 2 8	Decay Heat Removal	-	335	48	72	773	344	-	301	1,873	1,873	-	-	7,317	1,427	-	-	-	388,379	6,084	-
4b 1 2 9	Diesel Fuel Oil Tanks-UST's	-	24	-	-	-	-	-	4	27	-	-	27	-	-	-	-	-	-	493	-
4b 1 2 10	Domestic Water	-	44	-	-	-	-	-	7	51	-	-	51	-	-	-	-	-	-	985	-
4b 1 2 11	Domestic Water - RCA	-	75	1	2	55	-	-	28	162	162	-	-	525	-	-	-	-	21,339	1,106	-
4b 1 2 12	Electrical - Clean	-	614	-	-	-	-	-	92	706	-	-	706	-	-	-	-	-	-	13,208	-
4b 1 2 13	Electrical - Contaminated	-	604	8	21	464	-	-	224	1,321	1,321	-	-	4,394	-	-	-	-	178,459	10,259	-
4b 1 2 14	Electrical - Decontaminated	-	4,241	77	196	4,402	-	-	1,758	10,674	10,674	-	-	41,690	-	-	-	-	1,693,054	68,485	-
4b 1 2 15	Fire Service Water	-	310	-	-	-	-	-	47	357	-	-	357	-	-	-	-	-	-	6,727	-
4b 1 2 16	Fire Service Water - RCA	-	610	13	34	752	-	-	272	1,680	1,680	-	-	7,126	-	-	-	-	289,375	9,742	-
4b 1 2 17	Floor & Equip Drains - Aux & Reac Bldg	-	200	28	36	276	215	-	153	908	908	-	-	2,614	886	-	-	-	163,075	3,483	-
4b 1 2 18	HVAC - Auxiliary Bldg	-	258	7	20	441	-	-	134	860	860	-	-	4,174	-	-	-	-	169,500	4,279	-
4b 1 2 19	HVAC - Clean Machine Shop	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	196	-
4b 1 2 20	HVAC - Control Complex	-	42	-	-	-	-	-	6	48	-	-	48	-	-	-	-	-	-	944	-
4b 1 2 21	HVAC - Diesel Gen Bldg	-	7	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	168	-
4b 1 2 22	HVAC - Fire Pump House	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	72	-
4b 1 2 23	HVAC - Fuel Handling Area	-	240	5	14	317	-	-	110	687	687	-	-	3,001	-	-	-	-	121,884	3,690	-
4b 1 2 24	HVAC - Hot Machine Shop	-	40	1	2	54	-	-	19	116	116	-	-	511	-	-	-	-	20,735	662	-
4b 1 2 25	HVAC - Intermediate Bldg	-	77	3	8	190	-	-	49	328	328	-	-	1,799	-	-	-	-	73,076	1,291	-
4b 1 2 26	HVAC - Maintenance Support	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	162	-
4b 1 2 27	HVAC - Office Bldg	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	176	-
4b 1 2 28	HVAC - Reactor Bldg	-	486	14	36	818	-	-	251	1,606	1,606	-	-	7,751	-	-	-	-	314,790	7,743	-
4b 1 2 29	HVAC - Turbine Bldg	-	127	-	-	-	-	-	19	146	-	-	146	-	-	-	-	-	-	3,059	-
4b 1 2 30	ICI Instrumentation	-	128	1	3	78	-	-	44	255	255	-	-	740	-	-	-	-	30,061	1,883	-
4b 1 2 31	Industrial Cooler Water	-	34	-	-	-	-	-	5	39	-	-	39	-	-	-	-	-	-	731	-
4b 1 2 32	Industrial Cooler Water - RCA	-	236	4	11	245	-	-	98	594	594	-	-	2,320	-	-	-	-	94,222	3,708	-
4b 1 2 33	Instrument & Station Service Air	-	83	-	-	-	-	-	12	96	-	-	96	-	-	-	-	-	-	1,884	-
4b 1 2 34	Instrument & Station Service Air - Cont	-	188	2	5	123	-	-	66	384	384	-	-	1,160	-	-	-	-	47,115	3,121	-
4b 1 2 35	Instrument & Station Service Air - RCA	-	338	4	9	212	-	-	118	682	682	-	-	2,012	-	-	-	-	81,728	5,162	-
4b 1 2 36	Leak Rate Test - Cont	-	105	1	3	76	-	-	38	224	224	-	-	723	-	-	-	-	29,355	1,775	-
4b 1 2 37	Leak Rate Test - RCA	-	95	2	4	100	-	-	40	241	241	-	-	945	-	-	-	-	38,385	1,566	-
4b 1 2 38	Liquid Waste Disposal	-	1,028	72	81	372	590	-	480	2,623	2,623	-	-	3,528	2,431	-	-	-	299,737	17,069	-
4b 1 2 39	Makeup & Purification	-	709	8	20	460	-	-	250	1,448	1,448	-	-	4,355	-	-	-	-	176,876	11,685	-
4b 1 2 40	Makeup & Purification - Insulated	-	180	2	4	99	-	-	61	346	346	-	-	941	-	-	-	-	38,212	2,994	-
4b 1 2 41	Nitrogen/Hydrogen/Carbon Dioxide - Cont	-	27	0	1	16	-	-	9	53	53	-	-	148	-	-	-	-	6,028	419	-
4b 1 2 42	Nitrogen/Hydrogen/Carbon Dioxide - RCA	-	99	1	3	68	-	-	36	207	207	-	-	644	-	-	-	-	26,153	1,402	-
4b 1 2 43	Noble Gas Effluent Monitoring - Cont	-	24	0	1	16	-	-	9	50	50	-	-	152	-	-	-	-	6,172	389	-
4b 1 2 44	Noble Gas Effluent Monitoring - RCA	-	20	0	1	16	-	-	7	44	44	-	-	152	-	-	-	-	6,172	299	-
4b 1 2 45	Nuc Serv Closed Cycle Cooling - Cont	-	787	22	58	1,300	-	-	403	2,569	2,569	-	-	12,315	-	-	-	-	500,136	13,503	-
4b 1 2 46	Nuc Serv Closed Cycle Cooling - RCA	-	686	29	73	1,648	-	-	433	2,870	2,870	-	-	15,611	-	-	-	-	633,983	11,323	-
4b 1 2 47	PASS Containment Monitoring - Cont	-	9	0	0	5	-	-	3	17	17	-	-	44	-	-	-	-	1,777	147	-
4b 1 2 48	PASS Containment Monitoring - RCA	-	20	0	1	14	-	-	7	42	42	-	-	128	-	-	-	-	5,207	306	-
4b 1 2 49	Post Accident Sampling - Cont	-	36	0	1	22	-	-	12	71	71	-	-	205	-	-	-	-	8,339	579	-
4b 1 2 50	Post Accident Sampling - RCA	-	33	0	1	25	-	-	12	72	72	-	-	237	-	-	-	-	9,629	520	-
4b 1 2 51	Post Accident Venting - Cont	-	40	1	2	43	-	-	17	103	103	-	-	411	-	-	-	-	16,678	680	-
4b 1 2 52	Post Accident Venting - RCA	-	15	0	1	17	-	-	6	40	40	-	-	162	-	-	-	-	6,581	234	-
4b 1 2 53	RB Penetration Cooling - RCA	-	138	2	5	101	-	-	51	296	296	-	-	960	-	-	-	-	39,005	2,178	-
4b 1 2 54	RCP Lube Oil - Cont	-	5	0	0	6	-	-	2	14	14	-	-	58	-	-	-	-	2,361	85	-

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Table C
Crystal River Unit 3 Nuclear Generating Plant
SAFSTOR Decommissioning Cost Estimate with Dry Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Disposal of Plant Systems (continued)																					
4b 1 2 55	RCP Lube Oil - RCA	-	4	0	0	6	-	-	2	13	13	-	-	58	-	-	-	-	2,361	66	-
4b 1 2 56	Radwaste Demineralizer	-	35	3	3	19	19	-	17	96	96	-	-	177	79	-	-	-	12,351	583	-
4b 1 2 57	Reac Bldg Pressure Sensing & Test	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	55	-
4b 1 2 58	Reac Bldg Pressure Sensing & Test - RCA	-	47	1	1	31	-	-	17	97	97	-	-	293	-	-	-	-	11,905	673	-
4b 1 2 59	Reactor Building Spray	-	256	5	13	291	-	-	110	675	675	-	-	2,752	-	-	-	-	111,740	4,454	-
4b 1 2 60	Refueling Equipment	-	154	10	15	149	81	-	84	493	493	-	-	1,412	337	-	-	-	78,738	3,006	-
4b 1 2 61	Sewage	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	282	-
4b 1 2 62	Spent Fuel Cooling	-	571	41	57	417	347	-	305	1,738	1,738	-	-	3,950	1,445	-	-	-	252,551	10,116	-
4b 1 2 63	Waste Gas Sampling	-	77	1	2	47	-	-	27	153	153	-	-	443	-	-	-	-	18,005	1,190	-
4b 1 2 64	Wet Layup/N2 Blanketing	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	112	-
4b 1 2 65	Wet Layup/N2 Blanketing - Cont	-	8	0	0	4	-	-	3	16	16	-	-	40	-	-	-	-	1,626	132	-
4b 1 2 66	Wet Layup/N2 Blanketing - RCA	-	4	0	0	3	-	-	1	8	8	-	-	24	-	-	-	-	978	61	-
4b 1 2	Totals	-	15,284	436	874	15,703	1,596	-	6,610	40,504	38,889	-	1,615	148,720	6,605	-	-	-	6,462,935	259,219	-
4b 1 3	Scaffolding in support of decommissioning	-	1,695	30	9	138	25	-	455	2,351	2,351	-	-	1,176	104	-	-	-	59,524	37,681	-
Decontamination of Site Buildings																					
4b 1 4 1	Reactor	1,051	499	23	64	240	96	-	722	2,695	2,695	-	-	2,269	2,145	-	-	-	205,411	28,533	-
4b 1 4 2	Auxiliary Building	371	116	7	49	52	70	-	248	914	914	-	-	497	1,997	-	-	-	114,444	8,774	-
4b 1 4 3	Interior Concrete Reactor Building	-	174	182	1,419	-	1,967	-	766	4,509	4,509	-	-	-	59,501	-	-	-	2,810,700	2,638	-
4b 1 4 4	Intermediate Bldg	79	41	3	21	22	30	-	64	260	260	-	-	208	860	-	-	-	49,169	2,078	-
4b 1 4 5	Machine Shop - Hot	58	12	1	8	0	11	-	36	125	125	-	-	3	331	-	-	-	15,753	1,236	-
4b 1 4 6	OTSG Storage Building	11	44	2	19	-	27	-	26	130	130	-	-	-	811	-	-	-	38,322	879	-
4b 1 4 7	RB Maintenance Bldg and HP Office	7	5	0	2	-	3	-	6	23	23	-	-	-	90	-	-	-	4,260	199	-
4b 1 4 8	RM Warehouse	44	38	2	18	-	26	-	41	169	169	-	-	-	773	-	-	-	36,510	1,383	-
4b 1 4 9	RVCH Storage Building	5	2	0	1	3	1	-	4	16	16	-	-	27	23	-	-	-	2,183	130	-
4b 1 4 10	Fuel Handling Area (Aux Bldg)	797	656	17	55	462	86	-	664	2,738	2,738	-	-	4,376	1,524	-	-	-	252,738	27,182	-
4b 1 4	Totals	2,423	1,587	239	1,657	779	2,317	-	2,577	11,579	11,579	-	-	7,380	68,055	-	-	-	3,529,491	73,033	-
4b 1 5	Prepare/submit License Termination Plan	-	-	-	-	-	-	522	78	601	601	-	-	-	-	-	-	-	-	-	4,096
4b 1 6	Receive NRC approval of termination plan									a											
4b 1	Subtotal Period 4b Activity Costs	2,423	18,567	705	2,540	16,620	3,938	522	9,720	55,035	53,420	-	1,615	157,277	74,764	-	-	-	10,051,950	369,933	4,096
Period 4b Additional Costs																					
4b 2 1	License Termination Survey Planning	-	-	-	-	-	-	1,641	492	2,133	2,133	-	-	-	-	-	-	-	-	-	12,480
4b 2 2	Decommissioning of ISFSI	-	43	136	1,016	-	1,280	3,037	1,378	6,890	6,890	-	-	-	16,619	-	-	-	1,997,380	8,495	10,495
4b 2 3	West Settling Pond	-	26	0	74	-	837	-	227	1,164	1,164	-	-	-	13,500	-	-	-	1,053,000	309	-
4b 2 4	Underground Services Excavation	-	4,913	-	-	-	-	2,287	1,571	8,771	8,771	-	-	-	-	-	-	-	-	35,000	-
4b 2 5	Remedial Action Surveys	-	-	-	-	-	-	2,755	826	3,581	3,581	-	-	-	-	-	-	-	-	39,636	-
4b 2 6	Operational Tools & Equipment	-	-	74	162	2,675	-	-	433	3,344	3,344	-	-	41,160	-	-	-	-	1,029,000	155	-
4b 2 7	Transfer Canal Sand Removal	-	42	0	87	-	689	-	196	1,013	1,013	-	-	-	11,100	-	-	-	1,436,994	753	-
4b 2 8	Lead Abatement Crew	-	1,148	-	-	-	-	-	287	1,435	1,435	-	-	-	-	-	-	-	-	23,797	-
4b 2 9	Insurance Credits	-	-	-	-	-	-	(2,421)	-	(2,421)	(2,421)	-	-	-	-	-	-	-	-	-	-
4b 2	Subtotal Period 4b Additional Costs	-	6,172	210	1,339	2,675	2,806	7,299	5,411	25,912	25,912	-	-	41,160	41,219	-	-	-	5,516,374	108,146	22,975
Period 4b Collateral Costs																					
4b 3 1	Process decommissioning water waste	8	-	14	54	-	57	-	28	161	161	-	-	-	129	-	-	-	7,729	25	-
4b 3 3	Small tool allowance	-	343	-	-	-	-	-	51	394	394	-	-	-	-	-	-	-	-	-	-
4b 3 4	Decommissioning Equipment Disposition	-	-	153	50	702	127	-	160	1,191	1,191	-	-	6,000	529	-	-	-	303,608	147	-
4b 3 5	On-site survey and release of 134 9 tons clean metallic waste	-	-	-	-	-	-	197	20	217	217	-	-	-	-	-	-	-	-	-	-
4b 3	Subtotal Period 4b Collateral Costs	8	343	167	104	702	183	197	259	1,963	1,963	-	-	6,000	658	-	-	-	311,337	172	-
Period 4b Period-Dependent Costs																					
4b 4 1	Decon supplies	1,221	-	-	-	-	-	-	305	1,526	1,526	-	-	-	-	-	-	-	-	-	-
4b 4 2	Insurance	-	-	-	-	-	-	770	77	847	847	-	-	-	-	-	-	-	-	-	-
4b 4 3	Property taxes	-	-	-	-	-	-	812	-	812	812	-	-	-	-	-	-	-	-	-	-
4b 4 4	Health physics supplies	-	3,238	-	-	-	-	-	810	4,048	4,048	-	-	-	-	-	-	-	-	-	-
4b 4 5	Heavy equipment rental	-	4,301	-	-	-	-	-	645	4,946	4,946	-	-	-	-	-	-	-	-	-	-
4b 4 6	Disposal of DAW generated	-	-	136	30	-	302	-	94	562	562	-	-	-	5,857	-	-	-	117,133	191	-
4b 4 7	Plant energy budget	-	-	-	-	-	-	1,486	223	1,709	1,709	-	-	-	-	-	-	-	-	-	-
4b 4 8	Non-Labor Reoccuring	-	-	-	-	-	-	2,812	422	3,234	3,234	-	-	-	-	-	-	-	-	-	-
4b 4 9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	772	116	887	887	-	-	-	-	-	-	-	-	-	-
4b 4 10	Florida LLRW Inspection Fee	-	-	-	-	-	-	638	96	733	733	-	-	-	-	-	-	-	-	-	-
4b 4 11	Corporate A&G	-	-	-	-	-	-	1,143	172	1,315	1,315	-	-	-	-	-	-	-	-	-	-
4b 4 12	Security Staff Cost	-	-	-	-	-	-	2,822	423	3,245	3,245	-	-	-	-	-	-	-	-	-	123,945
4b 4 13	DOC Staff Cost	-	-	-	-	-	-	23,518	3,528	27,046	27,046	-	-	-	-	-	-	-	-	-	265,739

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Table C
Crystal River Unit 3 Nuclear Generating Plant
SAFSTOR Decommissioning Cost Estimate with Dry Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 4b Period-Dependent Costs (continued)																					
4b 4 14	Utility Staff Cost	-	-	-	-	-	-	28,536	4,280	32,816	32,816	-	-	-	-	-	-	-	-	-	468,017
4b 4	Subtotal Period 4b Period-Dependent Costs	1,221	7,539	136	30	-	302	63,308	11,189	83,726	83,726	-	-	-	5,857	-	-	-	117,133	191	857,701
4b 0	TOTAL PERIOD 4b COST	3,652	32,620	1,218	4,014	19,997	7,230	71,326	26,579	166,636	165,021	-	1,615	204,437	122,498	-	-	-	15,996,790	478,441	884,772
PERIOD 4f - License Termination																					
Period 4f Direct Decommissioning Activities																					
4f 1 1	ORISE confirmatory survey	-	-	-	-	-	-	171	51	222	222	-	-	-	-	-	-	-	-	-	-
4f 1 2	Terminate license									a											
4f 1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	171	51	222	222	-	-	-	-	-	-	-	-	-	-
Period 4f Additional Costs																					
4f 2 1	License Termination Survey	-	-	-	-	-	-	7,995	2,399	10,394	10,394	-	-	-	-	-	-	-	-	126,566	6,240
4f 2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	7,995	2,399	10,394	10,394	-	-	-	-	-	-	-	-	126,566	6,240
Period 4f Collateral Costs																					
4f 3 1	DOC staff relocation expenses	-	-	-	-	-	-	1,474	221	1,695	1,695	-	-	-	-	-	-	-	-	-	-
4f 3	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	1,474	221	1,695	1,695	-	-	-	-	-	-	-	-	-	-
Period 4f Period-Dependent Costs																					
4f 4 1	Insurance	-	-	-	-	-	-	303	30	333	333	-	-	-	-	-	-	-	-	-	-
4f 4 2	Property taxes	-	-	-	-	-	-	320	-	320	320	-	-	-	-	-	-	-	-	-	-
4f 4 3	Health physics supplies	-	682	-	-	-	-	-	171	853	853	-	-	-	-	-	-	-	-	-	-
4f 4 4	Disposal of DAW generated	-	-	8	2	-	18	-	6	34	34	-	-	-	350	-	-	-	6,999	11	-
4f 4 5	Plant energy budget	-	-	-	-	-	-	156	23	179	179	-	-	-	-	-	-	-	-	-	-
4f 4 6	Non-Labor Reoccuring	-	-	-	-	-	-	1,105	166	1,271	1,271	-	-	-	-	-	-	-	-	-	-
4f 4 7	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
4f 4 8	Corporate A&G	-	-	-	-	-	-	449	67	517	517	-	-	-	-	-	-	-	-	-	-
4f 4 9	Security Staff Cost	-	-	-	-	-	-	439	66	505	505	-	-	-	-	-	-	-	-	-	18,737
4f 4 10	DOC Staff Cost	-	-	-	-	-	-	5,308	796	6,104	6,104	-	-	-	-	-	-	-	-	-	56,992
4f 4 11	Utility Staff Cost	-	-	-	-	-	-	5,087	763	5,850	5,850	-	-	-	-	-	-	-	-	-	74,168
4f 4	Subtotal Period 4f Period-Dependent Costs	-	682	8	2	-	18	13,168	2,088	15,966	15,966	-	-	-	350	-	-	-	6,999	11	149,897
4f 0	TOTAL PERIOD 4f COST	-	682	8	2	-	18	22,809	4,759	28,278	28,278	-	-	-	350	-	-	-	6,999	126,577	156,137
PERIOD 4 TOTALS		4,068	69,338	14,421	11,254	27,951	47,698	149,983	76,120	400,833	396,667	-	4,166	279,217	181,484	1,252	462	1,654	24,262,960	907,152	1,796,702
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b 1 1 1	Reactor	-	2,388	-	-	-	-	-	358	2,746	-	-	2,746	-	-	-	-	-	-	21,356	-
5b 1 1 2	500 KV Switchyard Structures	-	67	-	-	-	-	-	10	77	-	-	77	-	-	-	-	-	-	879	-
5b 1 1 3	AAC Diesel Generator Building	-	21	-	-	-	-	-	3	24	-	-	24	-	-	-	-	-	-	223	-
5b 1 1 4	Auxiliary Building	-	926	-	-	-	-	-	139	1,065	-	-	1,065	-	-	-	-	-	-	7,894	-
5b 1 1 5	Central Alarm Station	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	17	-
5b 1 1 6	Chemical Storage	-	31	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	168	-
5b 1 1 7	Control Complex	-	423	-	-	-	-	-	64	487	-	-	487	-	-	-	-	-	-	2,606	-
5b 1 1 8	Diesel Fuel Oil Tanks UST's	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	62	-
5b 1 1 9	Diesel Generator Bldg	-	178	-	-	-	-	-	27	204	-	-	204	-	-	-	-	-	-	1,303	-
5b 1 1 10	Discharge Structure	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	71	-
5b 1 1 11	EFW Pump Building	-	75	-	-	-	-	-	11	86	-	-	86	-	-	-	-	-	-	446	-
5b 1 1 12	Fire Pumphouse	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	182	-
5b 1 1 13	GTCC Storage Container	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	8	-
5b 1 1 14	Intermediate Bldg	-	592	-	-	-	-	-	89	680	-	-	680	-	-	-	-	-	-	1,950	-
5b 1 1 15	Machine Shop - Cold	-	59	-	-	-	-	-	9	68	-	-	68	-	-	-	-	-	-	765	-
5b 1 1 16	Machine Shop - Hot	-	56	-	-	-	-	-	8	65	-	-	65	-	-	-	-	-	-	741	-
5b 1 1 17	Misc Yard Structures & Foundations	-	1,217	-	-	-	-	-	183	1,399	-	-	1,399	-	-	-	-	-	-	5,134	-
5b 1 1 18	Miscellaneous Yard Structures	-	1,196	-	-	-	-	-	179	1,376	-	-	1,376	-	-	-	-	-	-	10,257	-
5b 1 1 19	NAB	-	392	-	-	-	-	-	59	451	-	-	451	-	-	-	-	-	-	4,661	-
5b 1 1 20	NSOC	-	82	-	-	-	-	-	12	95	-	-	95	-	-	-	-	-	-	1,032	-
5b 1 1 21	OTSG Storage Building	-	261	-	-	-	-	-	39	300	-	-	300	-	-	-	-	-	-	1,432	-
5b 1 1 22	PAB/TSC	-	142	-	-	-	-	-	21	163	-	-	163	-	-	-	-	-	-	1,696	-
5b 1 1 23	RB Maintenance Bldg and HP Office	-	45	-	-	-	-	-	7	52	-	-	52	-	-	-	-	-	-	644	-
5b 1 1 24	RM Warehouse	-	31	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	256	-

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Table C
Crystal River Unit 3 Nuclear Generating Plant
SAFSTOR Decommissioning Cost Estimate with Dry Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Demolition of Remaining Site Buildings (continued)																					
5b 1 1 25	RVCH Storage Building	-	41	-	-	-	-	-	6	47	-	-	47	-	-	-	-	-	-	218	-
5b 1 1 26	Rusty Bldg	-	211	-	-	-	-	-	32	243	-	-	243	-	-	-	-	-	-	3,159	-
5b 1 1 27	Turbine Building	-	2,071	-	-	-	-	-	311	2,381	-	-	2,381	-	-	-	-	-	-	24,181	-
5b 1 1 28	Turbine Pedestal	-	233	-	-	-	-	-	35	268	-	-	268	-	-	-	-	-	-	1,267	-
5b 1 1 29	Fuel Handling Area (Aux Bldg)	-	589	-	-	-	-	-	88	678	-	-	678	-	-	-	-	-	-	5,274	-
5b 1 1	Totals	-	11,366	-	-	-	-	-	1,705	13,071	-	-	13,071	-	-	-	-	-	-	97,880	-
Site Closeout Activities																					
5b 1 2	BackFill Site	-	333	-	-	-	-	-	50	383	-	-	383	-	-	-	-	-	-	590	-
5b 1 3	Grade & landscape site	-	464	-	-	-	-	-	70	534	-	-	534	-	-	-	-	-	-	947	-
5b 1 4	Final report to NRC	-	-	-	-	-	-	199	30	229	229	-	-	-	-	-	-	-	-	-	1,560
5b 1	Subtotal Period 5b Activity Costs	-	12,163	-	-	-	-	199	1,854	14,217	229	-	13,988	-	-	-	-	-	-	99,417	1,560
Period 5b Additional Costs																					
5b 2 1	Concrete Crushing	-	623	-	-	-	-	11	95	729	-	-	729	-	-	-	-	-	-	2,911	-
5b 2 2	Demolition of ISFSI	-	1,408	-	-	-	-	130	231	1,769	-	-	1,769	-	-	-	-	-	-	6,038	160
5b 2 3	Discharge Cofferdam	-	241	-	-	-	-	-	36	278	-	-	278	-	-	-	-	-	-	2,092	-
5b 2 4	Firing Range Closure	-	-	-	-	-	-	901	135	1,037	-	-	1,037	-	-	-	-	-	-	-	-
5b 2 5	Security VBS Barriers and Hardware	-	356	-	-	-	-	-	53	409	-	-	409	-	-	-	-	-	-	1,608	-
5b 2	Subtotal Period 5b Additional Costs	-	2,628	-	-	-	-	1,043	551	4,222	-	-	4,222	-	-	-	-	-	-	12,648	160
Period 5b Collateral Costs																					
5b 3 1	Small tool allowance	-	92	-	-	-	-	-	14	106	-	-	106	-	-	-	-	-	-	-	-
5b 3	Subtotal Period 5b Collateral Costs	-	92	-	-	-	-	-	14	106	-	-	106	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b 4 2	Property taxes	-	-	-	-	-	-	639	-	639	-	-	639	-	-	-	-	-	-	-	-
5b 4 3	Heavy equipment rental	-	4,722	-	-	-	-	-	708	5,430	-	-	5,430	-	-	-	-	-	-	-	-
5b 4 4	Plant energy budget	-	-	-	-	-	-	156	23	179	-	-	179	-	-	-	-	-	-	-	-
5b 4 5	Non-Labor Reoccuring	-	-	-	-	-	-	2,214	332	2,547	-	-	2,547	-	-	-	-	-	-	-	-
5b 4 6	Corporate A&G	-	-	-	-	-	-	901	135	1,036	-	-	1,036	-	-	-	-	-	-	-	-
5b 4 7	Security Staff Cost	-	-	-	-	-	-	878	132	1,010	-	-	1,010	-	-	-	-	-	-	-	37,474
5b 4 8	DOC Staff Cost	-	-	-	-	-	-	10,260	1,539	11,798	-	-	11,798	-	-	-	-	-	-	-	106,177
5b 4 9	Utility Staff Cost	-	-	-	-	-	-	4,118	618	4,735	-	-	4,735	-	-	-	-	-	-	-	60,896
5b 4	Subtotal Period 5b Period-Dependent Costs	-	4,722	-	-	-	-	19,166	3,487	27,375	-	-	27,375	-	-	-	-	-	-	-	204,547
5b 0	TOTAL PERIOD 5b COST	-	19,605	-	-	-	-	20,407	5,906	45,919	229	-	45,690	-	-	-	-	-	-	112,065	206,267
PERIOD 5 TOTALS		-	19,605	-	-	-	-	20,407	5,906	45,919	229	-	45,690	-	-	-	-	-	-	112,065	206,267
TOTAL COST TO DECOMMISSION		5,076	96,308	14,561	11,285	27,951	48,007	555,254	137,451	895,893	748,844	95,143	51,906	279,217	187,470	1,252	462	1,654	24,382,680	1,049,912	6,338,851

TOTAL COST TO DECOMMISSION WITH 18.12% CONTINGENCY:	$895,893	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 83.59% OR:	$748,844	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 10.62% OR:	$95,143	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 5.79% OR:	$51,906	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	189,184	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	1,654	cubic feet
TOTAL SCRAP METAL REMOVED:	40,213	tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,049,912	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0 5 but is non-zero
A cell containing " - " indicates a zero value

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APPENDIX D

ISFSI DECOMMISSIONING COST ANALYSIS

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Table D
Crystal River Unit 3 Nuclear Generating Plant
ISFSI Decommissioning Cost Estimate
SAFSTOR Decommissioning Alternatives
(thousands of 2017 dollars)

Activity Description	Decon Costs	Removal Costs	Packaging Costs	Transport Costs	LLRW Disposal Costs	Other Costs	Total Costs	Burial Volume Class A (cubic feet)	Craft Manhours	Oversight and Contractor Manhours
Decommissioning Contractor										
Planning (characterization, specs and procedures)	-	-	-	-	-	187	187	-	-	1,000
Decontamination (activated disposition)	-	43	136	1,016	1,280	-	2,475	16,619	254	-
License Termination (radiological surveys)	-	-	-	-	-	1,041	1,041	-	8,241	-
Subtotal	**-**	**43**	**136**	**1,016**	**1,280**	**1,228**	**3,703**	**16,619**	**8,495**	**1,000**
Supporting Costs										
NRC and NRC Contractor Fees and Costs	-	-	-	-	-	352	352	-	-	776
Insurance	-	-	-	-	-	66	66	-	-	-
Property Taxes	-	-	-	-	-	140	140	-	-	-
Plant energy budget	-	-	-	-	-	34	34	-	-	-
Non-Labor Reoccuring	-	-	-	-	-	485	485	-	-	-
Corporate A&G	-	-	-	-	-	197	197	-	-	-
Florida LLRW Inspection Fee	-	-	-	-	-	32	32	-	-	-
Security Staff	-	-	-	-	-	257	257	-	-	4,958
Oversight Staff	-	-	-	-	-	246	246	-	-	3,761
Subtotal	**-**	**-**	**-**	**-**	**-**	**1,809**	**1,809**	**-**	**-**	**9,495**
Total (w/o contingency)	**-**	**43**	**136**	**1,016**	**1,280**	**3,037**	**5,512**	**16,619**	**8,495**	**10,495**
Total (w/25% contingency)		**54**	**170**	**1,270**	**1,601**	**3,797**	**6,890**			

The application of contingency (25%) is consistent with the evaluation criteria referenced by the NRC in NUREG-1757 ("Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. NRC's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Vol. 3, Rev. 1, February 2012)

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	DECOMMISSIONING COST ESTIMATES		NON-QUALIFIED TRUST FUND						QUALIFIED TRUST FUND (De-Risked)				
	Cost Estimate (2017 dollars) (Note 2)	Cost Estimate Escalated To Year of Spend	Beginning NQ Fund Balance	Planned Contributions (Transfers)	After-Tax Earnings	Decommissioning Payments (Withdrawals)	Ending NQ Fund Balance (Note 4)	Beginning Balance Qual Fund - Total	Beginning Balance De-Risked Qual Fund	Transfers to/ from Risked Fund	Total Earnings (AT) on De-Risked Portfolio	Decommissioning Payments (Withdrawals)	Est. Ending De-risked Balance
2017							281,010						106,097,835
2018	45,383,698	46,581,828	281,010	-	5,232	(286,242)	-	735,638,762	106,097,835	-	357,618	(46,295,586)	60,159,867
2019	19,482,231	20,524,471	-	-	-	-	5,000,000	714,963,735	60,159,867	(39,683,774)	48,378	(20,524,471)	-
2020	10,363,488	11,206,136	5,000,000	-	93,093	(5,093,093)	-	720,764,363	-	-	-	-	-
2021	10,417,098	11,561,477	-	-	-	-	-	743,423,678	-	-	-	-	-
2022	10,335,098	11,773,289	-	-	-	-	-	761,409,005	-	-	-	-	-
2023	10,335,098	12,084,104	-	-	-	-	-	779,899,013	-	-	-	-	-
2024	10,445,488	12,535,603	-	-	-	-	-	798,812,501	-	-	-	-	-
2025	10,335,098	12,730,567	-	-	-	-	-	818,022,298	-	-	-	-	-
2026	10,335,098	13,066,654	-	-	-	-	-	837,803,178	-	-	-	-	-
2027	10,417,098	13,518,023	-	-	-	-	-	858,033,443	-	-	-	-	-
2028	10,363,488	13,803,494	-	-	-	-	-	878,612,990	-	-	-	-	-
2029	10,335,098	14,129,094	-	-	-	-	-	899,725,840	-	-	-	-	-
2030	10,417,098	14,617,163	-	-	-	-	-	921,352,272	-	-	-	-	-
2031	10,335,098	14,884,957	-	-	-	-	-	943,346,404	-	-	-	-	-
2032	10,363,488	15,319,888	-	-	-	-	-	965,948,721	-	-	-	-	-
2033	10,417,098	15,805,674	-	-	-	-	-	989,012,353	-	-	-	-	-
2034	10,335,098	16,095,243	-	-	-	-	-	1,012,503,699	-	-	-	-	-
2035	10,335,098	16,520,157	-	-	-	-	-	1,036,640,998	-	-	-	-	-
2036	10,445,488	17,137,401	-	-	-	-	-	1,061,311,475	-	-	-	-	-
2037	15,312,597	25,785,866	-	-	-	-	-	1,086,339,436	-	-	-	-	-
2038	3,941,003	6,811,712	-	-	-	-	-	1,097,983,618	-	-	-	-	-
2039	4,023,003	7,137,014	-	-	-	-	-	1,138,409,580	-	-	-	-	-
2040	3,951,800	7,195,779	-	-	-	-	-	1,180,247,848	-	-	-	-	-
2041	3,941,003	7,365,568	-	-	-	-	-	1,223,831,657	-	-	-	-	-
2042	3,941,003	7,560,019	-	-	-	-	-	1,269,122,920	-	-	-	-	-
2043	3,941,003	7,759,603	-	-	-	-	-	1,316,170,129	-	-	-	-	-
2044	3,951,800	7,986,277	-	-	-	-	-	1,365,043,819	-	-	-	-	-
2045	3,941,003	8,174,718	-	-	-	-	-	1,415,795,141	-	-	-	-	-
2046	3,941,003	8,390,531	-	-	-	-	-	1,468,544,182	-	-	-	-	-
2047	3,941,003	8,612,041	-	-	-	-	-	1,523,349,196	-	-	-	-	-
2048	3,951,800	8,863,616	-	-	-	-	-	1,580,293,089	-	-	-	-	-
2049	3,941,003	9,072,759	-	-	-	-	-	1,639,437,453	-	-	-	-	-
2050	3,941,003	9,312,280	-	-	-	-	-	1,700,920,599	-	-	-	-	-
2051	3,941,003	9,558,124	-	-	-	-	-	1,764,812,428	-	-	-	-	-
2052	3,951,800	9,837,336	-	-	-	-	-	1,831,210,427	-	-	-	-	-
2053	3,941,003	10,069,454	-	-	-	-	-	1,900,188,666	-	-	-	-	-
2054	3,941,003	10,335,288	-	-	-	-	-	1,971,906,608	-	-	-	-	-
2055	3,941,003	10,608,140	-	-	-	-	-	2,046,448,045	-	-	-	-	-
2056	3,951,800	10,918,025	-	-	-	-	-	2,123,927,657	-	-	-	-	-
2057	3,941,003	11,175,643	-	-	-	-	-	2,204,434,414	-	-	-	-	-
2058	3,941,003	11,470,680	-	-	-	-	-	2,288,152,349	-	-	-	-	-
2059	3,941,003	11,773,506	-	-	-	-	-	2,375,181,817	-	-	-	-	-
2060	3,951,800	12,117,434	-	-	-	-	-	2,465,657,775	-	-	-	-	-
2061	3,941,003	12,403,352	-	-	-	-	-	2,559,686,971	-	-	-	-	-
2062	3,941,003	12,730,801	-	-	-	-	-	2,657,482,009	-	-	-	-	-
2063	3,941,003	13,066,894	-	-	-	-	-	2,759,162,982	-	87,744,537	-	-	87,744,537
2064	3,951,800	13,448,605	-	-	-	-	-	2,861,102,051	87,744,537	227,716,625	6,170,420	-	321,631,583
2065	3,941,003	13,765,933	-	-	-	-	-	2,963,393,529	321,631,583	454,430,844	15,179,781	-	791,242,209
2066	3,941,003	14,129,354	-	-	-	-	-	3,058,906,949	791,242,209	388,340,572	23,072,639	-	1,202,655,420
2067	26,269,503	96,668,289	-	-	-	-	-	3,148,649,596	1,202,655,420	323,956,890	28,915,121	(96,668,289)	1,458,859,142
2068	66,421,682	250,875,749	-	-	-	-	-	3,150,897,183	1,458,859,142	217,322,438	30,332,547	(250,875,749)	1,455,638,378
2069	129,141,638	500,647,146	-	-	-	-	-	2,993,996,911	1,455,638,378	123,236,571	25,986,465	(500,647,146)	1,104,214,268
2070	107,521,326	427,835,393	-	-	-	-	-	2,580,407,333	1,104,214,268	1,476,193,065	46,288,537	(427,835,393)	2,198,860,477
2071	87,388,125	356,903,794	-	-	-	-	-	2,198,860,477	2,198,860,477		39,519,192	(356,903,794)	1,881,475,875
2072	57,115,387	239,424,457	-	-	-	-	-	1,881,475,875	1,881,475,875		34,460,097	(239,424,457)	1,676,511,515
2073	31,555,242	135,769,916	-	-	-	-	-	1,676,511,515	1,676,511,515		31,464,735	(135,769,916)	1,572,206,334
2074	19,523,932	86,221,578	-	-	-	-	-	1,572,206,334	1,572,206,334		29,909,109	(86,221,578)	1,515,893,865
	895,892,646	**2,715,677,894**		**-**	**98,325**	**(5,379,335)**				**3,259,257,770**	**311,704,639**	**(2,161,166,379)**	

	QUALIFIED TRUST FUND (Risked)												
	Beginning Balance Risked Qual Fund	Planned Contributions (Transfers)	Total Earnings	Current Year Earnings Taxable	Portfolio Turnover	Realized Earnings From Turnover	Total Earnings Taxed	Tax	Decommissioning Payments (Withdrawals)	Annual Funding Requirement	Transfer to/ from De-Risked Fund	Estimated Ending Risked Balance	Ending Balance Qual Fund - Total
2017												629,540,927	735,638,762
2018	629,540,927	-	33,960,640	12,395,634	66,350,157	31,092,863	43,488,497	(8,697,699)	-	-	-	654,803,868	714,963,735
2019	654,803,868	-	35,323,452	12,893,060	69,012,732	32,340,593	45,233,653	(9,046,731)	-	-	39,683,774	720,764,363	720,764,363
2020	720,764,363	-	38,716,812	14,131,637	75,948,118	35,590,638	49,722,275	(9,944,455)	(6,113,042)	-	-	743,423,678	743,423,678
2021	743,423,678	-	39,792,213	14,524,158	78,321,589	36,702,889	51,227,047	(10,245,409)	(11,561,477)	-	-	761,409,005	761,409,005
2022	761,409,005	-	40,756,720	14,876,203	80,216,572	37,590,912	52,467,115	(10,493,423)	(11,773,289)	-	-	779,899,013	779,899,013
2023	779,899,013	-	41,745,782	15,237,210	82,164,479	38,503,736	53,740,946	(10,748,189)	(12,084,104)	-	-	798,812,501	798,812,501
2024	798,812,501	-	42,753,893	15,605,171	84,156,639	39,437,297	55,042,468	(11,008,494)	(12,535,603)	-	-	818,022,298	818,022,298
2025	818,022,298	-	43,784,909	15,981,492	86,180,721	40,385,818	56,367,309	(11,273,462)	(12,730,567)	-	-	837,803,178	837,803,178
2026	837,803,178	-	44,842,925	16,367,668	88,264,610	41,362,365	57,730,033	(11,546,007)	(13,066,654)	-	-	858,033,443	858,033,443
2027	858,033,443	-	45,922,074	16,761,557	90,395,552	42,360,962	59,122,519	(11,824,504)	(13,518,023)	-	-	878,612,990	878,612,990
2028	878,612,990	-	47,024,539	17,163,957	92,563,753	43,377,020	60,540,977	(12,108,195)	(13,803,494)	-	-	899,725,840	899,725,840
2029	899,725,840	-	48,154,692	17,576,462	94,788,053	44,419,367	61,995,829	(12,399,166)	(14,129,094)	-	-	921,352,272	921,352,272
2030	921,352,272	-	49,308,167	17,997,481	97,066,044	45,486,874	63,484,355	(12,696,871)	(14,617,163)	-	-	943,346,404	943,346,404
2031	943,346,404	-	50,487,419	18,427,908	99,383,382	46,572,820	65,000,728	(13,000,146)	(14,884,957)	-	-	965,948,721	965,948,721
2032	965,948,721	-	51,694,972	18,868,665	101,764,369	47,688,592	66,557,257	(13,311,451)	(15,319,888)	-	-	989,012,353	989,012,353
2033	989,012,353	-	52,926,039	19,318,004	104,193,839	48,827,085	68,145,089	(13,629,018)	(15,805,674)	-	-	1,012,503,699	1,012,503,699
2034	1,012,503,699	-	54,185,471	19,777,697	106,668,917	49,986,951	69,764,648	(13,952,930)	(16,095,243)	-	-	1,036,640,998	1,036,640,998
2035	1,036,640,998	-	55,476,099	20,248,776	109,211,710	51,178,549	71,427,325	(14,285,465)	(16,520,157)	-	-	1,061,311,475	1,061,311,475
2036	1,061,311,475	-	56,790,301	20,728,460	111,810,178	52,396,237	73,124,697	(14,624,939)	(17,137,401)	-	-	1,086,339,436	1,086,339,436
2037	1,086,339,436	-	57,907,166	21,136,115	114,424,660	81,249,473	102,385,588	(20,477,118)	(25,785,866)	-	-	1,097,983,618	1,097,983,618
2038	1,097,983,618	-	59,047,093	21,552,189	115,703,071	37,494,904	59,047,093	(11,809,419)	(6,811,712)	-	-	1,138,409,580	1,138,409,580
2039	1,138,409,580	-	61,219,101	22,344,972	119,962,868	38,874,129	61,219,101	(12,243,820)	(7,137,014)	-	-	1,180,247,848	1,180,247,848
2040	1,180,247,848	-	63,474,485	23,168,187	124,372,233	40,306,298	63,474,485	(12,694,897)	(7,195,779)	-	-	1,223,831,657	1,223,831,657
2041	1,223,831,657	-	65,821,038	24,024,679	128,965,270	41,796,359	65,821,038	(13,164,208)	(7,365,568)	-	-	1,269,122,920	1,269,122,920
2042	1,269,122,920	-	68,259,034	24,914,547	133,738,195	43,344,487	68,259,034	(13,651,807)	(7,560,019)	-	-	1,316,170,129	1,316,170,129
2043	1,316,170,129	-	70,791,617	25,838,940	138,696,175	44,952,677	70,791,617	(14,158,323)	(7,759,603)	-	-	1,365,043,819	1,365,043,819
2044	1,365,043,819	-	73,421,998	26,799,029	143,846,582	46,622,969	73,421,998	(14,684,400)	(7,986,277)	-	-	1,415,795,141	1,415,795,141
2045	1,415,795,141	-	76,154,700	27,796,465	149,194,984	48,358,234	76,154,700	(15,230,940)	(8,174,718)	-	-	1,468,544,182	1,468,544,182
2046	1,468,544,182	-	78,994,431	28,832,967	154,753,861	50,161,463	78,994,431	(15,798,886)	(8,390,531)	-	-	1,523,349,196	1,523,349,196
2047	1,523,349,196	-	81,944,917	29,909,895	160,529,411	52,035,022	81,944,917	(16,388,983)	(8,612,041)	-	-	1,580,293,089	1,580,293,089
2048	1,580,293,089	-	85,009,975	31,028,641	166,530,306	53,981,334	85,009,975	(17,001,995)	(8,863,616)	-	-	1,639,437,453	1,639,437,453
2049	1,639,437,453	-	88,194,882	32,191,132	172,763,233	56,003,750	88,194,882	(17,638,976)	(9,072,759)	-	-	1,700,920,599	1,700,920,599
2050	1,700,920,599	-	91,505,135	33,399,374	179,242,573	58,105,761	91,505,135	(18,301,027)	(9,312,280)	-	-	1,764,812,428	1,764,812,428
2051	1,764,812,428	-	94,945,154	34,654,981	185,975,758	60,290,173	94,945,154	(18,989,031)	(9,558,124)	-	-	1,831,210,427	1,831,210,427
2052	1,831,210,427	-	98,519,469	35,959,606	192,972,990	62,559,863	98,519,469	(19,703,894)	(9,837,336)	-	-	1,900,188,666	1,900,188,666
2053	1,900,188,666	-	102,234,245	37,315,500	200,242,291	64,918,746	102,234,245	(20,446,849)	(10,069,454)	-	-	1,971,906,608	1,971,906,608
2054	1,971,906,608	-	106,095,906	38,725,006	207,800,251	67,370,900	106,095,906	(21,219,181)	(10,335,288)	-	-	2,046,448,045	2,046,448,045
2055	2,046,448,045	-	110,109,691	40,190,037	215,655,774	69,919,654	110,109,691	(22,021,938)	(10,608,140)	-	-	2,123,927,657	2,123,927,657
2056	2,123,927,657	-	114,280,977	41,712,556	223,820,863	72,568,420	114,280,977	(22,856,195)	(10,918,025)	-	-	2,204,434,414	2,204,434,414
2057	2,204,434,414	-	118,616,972	43,295,195	232,305,139	75,321,777	118,616,972	(23,723,394)	(11,175,643)	-	-	2,288,152,349	2,288,152,349
2058	2,288,152,349	-	123,125,186	44,940,693	241,127,753	78,184,493	123,125,186	(24,625,037)	(11,470,680)	-	-	2,375,181,817	2,375,181,817
2059	2,375,181,817	-	127,811,830	46,651,318	250,299,365	81,160,512	127,811,830	(25,562,366)	(11,773,506)	-	-	2,465,657,775	2,465,657,775
2060	2,465,657,775	-	132,683,287	48,429,400	259,834,106	84,253,887	132,683,287	(26,536,657)	(12,117,434)	-	-	2,559,686,971	2,559,686,971
2061	2,559,686,971	-	137,747,988	50,278,016	269,743,496	87,469,972	137,747,988	(27,549,598)	(12,403,352)	-	-	2,657,482,009	2,657,482,009
2062	2,657,482,009	-	143,014,718	52,200,372	280,049,673	90,814,346	143,014,718	(28,602,944)	(12,730,801)	-	-	2,759,162,982	2,759,162,982
2063	2,759,162,982	-	143,757,455	52,471,471	378,036,581	91,285,984	143,757,455	(28,751,491)	(13,066,894)	-	(87,744,537)	2,773,357,514	2,861,102,051
2064	2,773,357,514	-	136,962,078	49,991,158	518,748,585	86,970,919	136,962,078	(27,392,416)	(13,448,605)	-	(227,716,625)	2,641,761,946	2,963,393,529
2065	2,641,761,946	-	117,624,466	42,932,930	730,369,485	74,691,536	117,624,466	(23,524,893)	(13,765,933)	-	(454,430,844)	2,267,664,741	3,058,906,949
2066	2,267,664,741	-	100,999,202	36,864,709	625,206,966	64,134,493	100,999,202	(20,199,840)	(14,129,354)	-	(388,340,572)	1,945,994,177	3,148,649,596
2067	1,945,994,177	-	87,500,944	31,937,844	527,306,402	55,563,099	87,500,944	(17,500,189)	-	-	(323,956,890)	1,692,038,041	3,150,897,183
2068	1,692,038,041	-	79,553,662	29,037,087	394,481,608	50,516,576	79,553,662	(15,910,732)	-	-	(217,322,438)	1,538,358,533	2,993,996,911
2069	1,538,358,533	-	76,338,878	27,863,691	284,706,312	48,475,188	76,338,878	(15,267,776)	-	-	(123,236,571)	1,476,193,065	2,580,407,333
2070	1,476,193,065	-	-	-	-	-	-	-	-	-	(1,476,193,065)	-	2,198,860,477
2071	-	-	-	-	-	-	-	-	-	-	-	-	1,881,475,875
2072	-	-	-	-	-	-	-	-	-	-	-	-	1,676,511,515
2073	-	-	-	-	-	-	-	-	-	-	-	-	1,572,206,334
2074	-	-	-	-	-	-	-	-	-	-	-	-	1,515,893,865
		-	**4,047,314,796**	**1,477,269,901**	**9,939,868,237**	**2,865,058,965**	**4,342,328,866**	**(868,465,773)**	**(549,132,180)**	**-**	**(3,259,257,770)**		

Inputs:

Duke Energy Florida Ownership		100.000%
Non Qual Trust Fund Balance (Note 1)	12/31/2017	281,010
Qual Growth Trust Fund Balance (Note 1)	12/31/2017	629,540,927
De-Risked Qual Trust Fund Balance (Note 1)	12/31/2017	106,097,835
TTD Q Unrealized Gains	12/31/2017	295,014,070
After-Tax Rate of Return - NQ		1 86%
Pre-Tax Rate of Return - Q		5 39%
De-Risked Earnings - NQ (100% cash)		1 86%
De-Risked Earnings - Q (100% cash)		2.45%
Escalation Factor		2.64%
Qualified Fund Tax Rate		20 00%
Portfolio Turnover		10 00%
Portion of Portfolio Turnover- Realized		46 86%
Current Income Percentage (i.e,. Dividend and Interest)		36 50%

Note 1: Trust fund balances are as of 12/31/2017 and represent the Qualified (growth and liquidity) or Non Qualified balance for the Unit.

Note 2: Per table provided in the 2017 TLG site-specific nuclear decommissioning cost study. Includes License Termination, Spent Fuel Management and Site Restoration costs. Amounts represent 100% of decommissioning costs.

Note 3: NDTF investments would be de-risked 5 years prior to significant spending (expected to occur in 2067) in order to ensure adequate and liquid funding is available to pay for decommissioning costs (current year spend + 4 additional years). The current Qualified liquidity portforlio balance will be exhausted before spending Qualified risked funds.

Note 4: Assumes receipt of City of Tallahassee's NDTF expected to occur in late 2019. $5 million represents tax-effected lump sum transfer to DEF (deposited into NQ fund).

Docket No. 20190140-EI
Cross-Examination
Hearing Exhibit

Exhibit No.: 13

Proffered by: Public Counsel

Short title: _____

Witness(s): _____

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 34
PARTY: OPC
DESCRIPTION: NRC Application Attachments

Accelerated Decommissioning Partners, LLC
17101 Preston Road, Suite 115 | Dallas, TX 75248

Scott E. State, P.E., Chief Executive Officer
sstate@NorthStar.com | c.303.898.8035

10 CFR 50.82(a)(7)

June 26, 2019

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738
(301) 415-7000

Director,
Office of Nuclear Reactor Regulation
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Subject: Notification of Revised Post-Shutdown Decommissioning Activities Report (Revised PSDAR)
Crystal River Unit 3 Nuclear Generating Plant (CR-3)
Docket Nos. 50-302 & 72-1035
License No. DPR-72

References:
(1) Letter, Duke Energy Florida, LLC (DEF) to USNRC, "Application for Order Consenting to Direct Transfer of Control of Licenses and Approving Conforming License Amendment" June 14, 2019 (ADAMS Accession No. ML19170A195).

(2) Letter, Duke Energy Florida, LLC (DEF), to USNRC transmitting "Post Shutdown Decommissioning Activities Report." December 2, 2013 (ADAMS Accession No. ML13340A009).

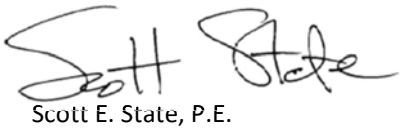
In Reference 1, Duke Energy Florida, LLC ("DEF"), on behalf of itself and ADP CR3, LLC ("ADP CR3"), and Accelerated Decommissioning Partners, LLC ("ADP"), requested that the U.S. Nuclear Regulatory Commission ("NRC") consent to direct and indirect transfers of control of DEF's Facility Operating License No. DPR-72 for the Crystal River Unit 3 Nuclear Generating Plant ("CR-3"), as well as the general license for the CR-3 Independent Spent Fuel Storage Installation (the "Licenses"). ADP is submitting this Revised Post Shutdown Decommissioning Activities Report providing the plan for activities to be conducted by ADP CR3 and ADP, if the Application for license transfers is approved.

In Reference 2, DEF submitted a Post Shutdown Decommissioning Activities Report in accordance with 10 CFR 50.82, "Termination of license," paragraph (a)(4)(i) ("2013 PSDAR"). This letter is provided to notify the NRC of a significant schedule change to the 2013 PSDAR in accordance with 10 CFR 50.82, "Termination of license," paragraph (a)(7), by which we intend to accelerate the decommissioning schedule if the Application for license transfers is approved. The Revised PSDAR is provided as an attachment to this letter. The attached Revised PSDAR demonstrates that our elected actions are consistent with NRC requirements for decommissioning activities.

If you have any questions about this letter, please contact me at 212.951.3660 or sstate@northstar.com.

Again, thank you for the opportunity to provide the attached information and we look forward to further discussions.

Sincerely,



Scott E. State, P.E.
Chief Executive Officer

CRYSTAL RIVER UNIT 3

Revised Crystal River Unit 3 Post Shutdown Decommissioning Activities Report

Prepared by Accelerated Decommissioning Partners, LLC

June 26, 2019

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Acronyms

ADP	Accelerated Decommissioning Partners LLC.
AIF	Atomic Industrial Forum
ALARA	As Low As Reasonably Achievable
BMP	Best Management Practices
CFR	Code of Federal Regulations
CR3	Crystal River Unit 3
CREC	Crystal River Energy Complex
DCE	Decommissioning Cost Estimate
D&D	Decontamination and Dismantlement
DEF	Duke Energy Florida, LLC.
DOE	Department of Energy
DSEIS	Draft Supplemental Environmental Impact Statement (NUREG-1437, Supp. 44)
FDEP	Florida Department of Environmental Protection
FPSC	Florida Public Service Commission
GEIS	Generic Environmental Impact Statement (NUREG-0586)
GTCC	Greater than Class C
GW	Groundwater
ISFSI	Independent Spent Fuel Storage Installation
LLRW	Low-Level Radioactive Waste
LTP	License Termination Plan
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MWt	Megawatt-thermal
NEI	Nuclear Energy Institute
NESP	National Environmental Studies Project
NPDES	National Pollutant Discharge Elimination System
PSDAR	Post-Shutdown Decommissioning Activities Report
PWR	Pressurized Water Reactor
SAR	Safety Analysis Report
SFP	Spent Fuel Pool
SNF	Spent Nuclear Fuel
SSCs	Structures, Systems and Components

1.0 INTRODUCTION AND SUMMARY

1.1 Introduction

This revised Post-Shutdown Decommissioning Activities Report (Revised PSDAR) for the Crystal River Unit 3 (CR3) is submitted to notify the U.S. Nuclear Regulatory Commission (NRC) of changes in the actions and schedules previously described in the PSDAR for CR3 submitted in December 2013 (Reference 1) (2013 PSDAR), supplemented by letter dated June 17, 2014 (Reference 2), and accepted by the NRC by letter dated March 11, 2015 (Reference 3). The 2013 PSDAR was submitted in accordance with the requirements of Title 10 of the Code of Federal Regulation (CFR) 50.82, "Termination of license" paragraph (a) (4) (i), and this PSDAR updates the information previously provided as required by 10 CFR 50.82(a)(7).

This Revised PSDAR is intended to apply based upon and contingent upon Duke Energy Florida, LLC. (DEF) completing a transfer of the NRC License for CR3 pursuant to the terms of the Decommissioning Services Agreement between DEF and ADP CR3, LLC. (ADP) dated as of May 29, 2019. Contemporaneously with the submittal of this Revised PSDAR, DEF and ADP will submit a joint petition to the Florida Public Service Commission seeking approval of the proposed decommissioning services arrangement. DEF and ADP submitted an application to the NRC requesting approval of the transfer of control of CR3 to ADP and of the transfer of the authority to possess, maintain and decommission CR3 from DEF to ADP (Reference 4). Upon completion of the proposed transfer, ADP will assume control of the CR3 facilities. In the event that ADP does not complete the proposed transaction, this revised PSDAR will be ineffective, and the 2013 PSDAR will remain in effect.

This revised PSDAR, which will apply upon ADP becoming the licensee for CR3, contains the following:

1. A description of the planned decommissioning activities along with a schedule for their accomplishment.
2. A discussion that provides the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements.
3. A site-specific decommissioning cost estimate (DCE), including the projected cost of managing irradiated fuel.

This Revised PSDAR is also consistent with expectations of the Florida Department of Environmental Protection (FDEP) regarding the decommissioning of CR3, as set forth FDEP letter to DEF dated February 15, 2019 ("Decommissioning End State Conditions").

The PSDAR has been developed consistent with Regulatory Guide 1.185, "Standard Format and Content for Post-Shutdown Decommissioning Activities Report," (Reference 5). This report is based on currently available information and the plans discussed herein may be modified as additional information becomes available or conditions change. As required by 10 CFR 50.82(a)(7), ADP will notify the NRC in writing before performing any decommissioning activity inconsistent with, or making any significant schedule change from, those actions and schedules described in the PSDAR, including changes that significantly increase the decommissioning cost.

1.2 Background

CR3 is part of the larger Crystal River Energy Complex (CREC), which is located on the Gulf of Mexico in Citrus County, Florida. DEF is the owner of the complex with ADP assuming control of CR3. This site location is approximately 7.5 miles northwest of the City of Crystal River, and 80 miles north of Tampa. In addition to CR3, other structures on the CREC include four fossil-fueled units (two operational and two permanently shut down), two large cooling towers, coal delivery and storage areas, ash storage area, office buildings, warehouses, barge handling docks, and a railroad. CR3 uses approximately 27 acres of previously disturbed land within the 1,062-acre developed portion of the 4,738-acre CREC site. A request for partial site release of 3,854 acres of non-impacted land from the 4,738-acre CREC site was submitted to the NRC on January 22, 2019 and is currently under review. CR3 is located at latitude 28° 57' 25.87" north and longitude 82° 41'" west.

CR3 is a single unit pressurized light-water reactor (PWR) supplied by Babcock & Wilcox. CR3 was initially licensed to operate at a maximum of 2,452 megawatt-thermal (MWt). In 1981, 2002, and 2007, the NRC approved three DEF requests to increase the licensed core power level to a maximum power level of 2,609 MWt. The reactor containment structure is a steel-lined, reinforced-concrete structure in the shape of a cylinder and capped with a shallow dome. The walls of the containment structure are approximately 3.5 feet thick. During operation, cooling water for CR3 was drawn from and returned to the Gulf of Mexico.

A brief history of the major milestones related to CR3 construction and operational history is as follows:

- Construction Permit Issued: September 25, 1968
- Operating License Issued: January 28, 1977
- Commercial Operation: March 13, 1977
- Initial Operating License Expiration: December 3, 2016
- Final Reactor Shutdown: September 26, 2009
- Final Removal of Fuel from Reactor Vessel: May 28, 2011
- Final Transfer of Fuel from Pool to ISFSI Pad January 12, 2018

By letter dated February 20, 2013, (Reference 6), DEF provided the NRC with the certification required by 10 CFR 50.82(a)(1)(i) and (ii), that operation had permanently ceased and that all fuel had been permanently removed from the reactor vessel at CR3. Upon docketing of these certifications pursuant to 10 CFR 50.82(a)(2), the 10 CFR Part 50 license for CR3 no longer authorized operation of the reactor or emplacement or retention of fuel in the reactor vessel.

On March 13, 2013, the NRC acknowledged the DEF certification of permanent cessation of power operation and permanent removal of fuel from the vessel, and that pursuant to 10 CFR 50.82(a)(2), the 10 CFR Part 50 license for CR3 no longer authorized operation of the reactor or emplacement or retention of fuel in the reactor vessel (Reference 7).

Pursuant to 10 CFR 50.51(b), “Continuation of license,” the license for a facility that has permanently ceased operations, continues in effect beyond the expiration date to authorize

ownership and possession of the utilization facility until the Commission notifies the licensee in writing that the license has been terminated.

During the period that the modified license remains in effect, 10 CFR 50.51(b) requires that ADP:

1. Take actions necessary to decommission and decontaminate the facility and continue to maintain the facility including storage, control, and maintenance of the spent fuel in a safe condition.
2. Conduct activities in accordance with all other restrictions applicable to the facility in accordance with NRC regulations and the 10 CFR 50 facility license.

10 CFR 50.82(a)(9) states that power reactor licensees must submit an application for termination of the license at least two years prior to the license termination date and that the application must be accompanied or preceded by a license termination plan to be submitted for NRC approval.

1.3 Summary of Decommissioning Alternatives

The NRC has evaluated the environmental impacts of three general methods for decommissioning power reactor facilities in NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Supplement 1, Regarding the Decommissioning of Nuclear Power Reactors," (GEIS) (Reference 8). The three general methods evaluated are summarized as follows:

- DECON: The equipment, structures and portions of the facility and site that contain radioactive contaminants are promptly removed or decontaminated to a level that permits termination of the license shortly after cessation of operations.

- SAFSTOR: After the plant is shut down and defueled, the facility is placed in a safe, stable condition and maintained in that state (safe storage). The facility is decontaminated and dismantled at the end of the storage period to levels that permit license termination. During SAFSTOR, a facility is left intact or may be partially dismantled, but the fuel is removed from the reactor vessel and radioactive liquids are drained from systems and components and then processed. Radioactive decay occurs during the SAFSTOR period, thereby reducing the quantity of contamination and radioactivity that must be disposed of during decontamination and dismantlement.

- ENTOMB: Radioactive structures, systems and components (SSCs) are encased in a structurally long-lived substance, such as concrete. The entombed structure is appropriately maintained, and continued surveillance is carried out until the radioactivity decays to a level that permits termination of the license.

The decommissioning approach selected by DEF for CR3 as stated in the 2013 PSDAR was the SAFSTOR method. In this Revised PSDAR, ADP has selected the DECON method, with decontamination and dismantlement activities commencing promptly. The primary objectives of the CR3 decommissioning project remain to remove the facility from service, reduce residual radioactivity to levels permitting unrestricted release, restore the site, perform this work safely, and complete the work in a cost-effective manner.
ADP intends to complete radiological decommissioning, site restoration, and release for

unrestricted use of all portions of the site other than the Independent Spent Fuel Storage Installation ("partial license termination") potentially as soon as 2026, but no later than the end of 2030. In accordance with 10CFR50.82(a)(9), a license termination plan will be developed and submitted for NRC approval at least 2 years prior to the expected date for partial site termination. Full NRC license termination will not occur until spent fuel and greater than class C (GTCC) has been removed from the site and the ISFSI is decommissioned.

With approval of the pending partial site release request and planned partial license termination, ADP plans to release the large majority of the CR3 site property for redevelopment decades sooner than planned under the 2013 PSDAR, thereby reducing the overall risk to the workers, public, and environment associated with the long-term storage of aged, excess nuclear facilities.

The decommissioning approach for CR3 is described in the following sections.

- Section 2.0 describes the planned decommissioning activities and the general timing of their implementation.
- Section 3.0 describes the overall decommissioning schedule, including the spent fuel management activities.
- Section 4.0 provides an analysis of expected decommissioning costs, including the costs associated with spent fuel management and site restoration.
- Section 5.0 describes the basis for concluding that the environmental impacts associated with decommissioning CR3 are bounded by the NRC generic environmental impact statement related to decommissioning.
- Section 6.0 is a list of references.

2.0 DESCRIPTION OF PLANNED DECOMMISSIONING ACTIVITIES

ADP plans to use the DECON method following contract execution. DECON is broadly defined in Section 1.3 of this report. Use of the DECON method will require the management of Spent Nuclear Fuel (SNF) because of the failure of the Department of Energy to perform its spent fuel removal obligations under the Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste (Standard Contract) for the CR3 SNF. An affiliate of ADP, ADP SF1, LLC (ADP SF1), has assumed title to the SNF and all rights under the Standard Contract. ADP SF1 will be responsible for funding the SNF costs incurred by ADP, and it will secure funds for this activity from its parent companies and through damages recoveries from DOE. To explain the basis for projecting the cost of managing SNF, a discussion of SNF management activities for the site is included herein. ADP has accelerated the timeline for the decontamination and dismantlement phase of the project and intends to begin DECON promptly after ADP becomes the NRC-licensed operator of the single-reactor facility and after transition of CR3 from Duke to ADP.

During the initial phase of decommissioning, the plant was configured to ensure continued safe storage of spent fuel while it remained in the spent fuel pool (SFP). Other activities being performed under the 2013 PSDAR have involved preparing the plant for a period of dormancy. This entailed draining fluids and de-energizing systems, and reconfiguring the electrical distribution, ventilation, heating, and fire protection systems. The spent fuel has been transferred to the ISFSI for dry storage until possession is transferred to the DOE. Spent fuel racks have been removed and shipped for disposal, and the spent fuel pool has been cleaned out and dewatered. The spent fuel will be stored in on-site dry storage at the ISFSI until transfer to the DOE, or an approved interim storage facility, which is assumed to be completed by 2037.

Under this revised PSDAR, ADP will commence decontamination and dismantlement (D&D) activities soon after the closing of the proposed transaction.

For the purposes of ADP's DECON decommissioning cost estimate ("DECON DCE"), it is assumed that remaining structures within the power block are to be demolished to depths of three feet below grade and backfilled with clean fill material. The Florida Department of Environmental Protection has concurred with the removal depth.

Decommissioning activities will be performed in accordance with written, reviewed and approved site procedures, as amended for ADP to begin decommissioning. There are no identified or anticipated decommissioning activities that are unique to the CR3 site and outside the bounds considered in the GEIS.

Radiological and environmental programs will be maintained throughout the decommissioning process to ensure occupational, public health and safety, and environmental compliance with all applicable laws and regulations. Radiological programs will be conducted in accordance with the facility's revised Technical Specifications, Operating License, Defueled Safety Analysis Report (DSAR), Radiological Environmental Monitoring Program, and the Offsite Dose Calculation Manual, as amended for ADP to begin decommissioning. Non-radiological Environmental Programs will be conducted in accordance with applicable requirements and permits.

Appendix 1 includes the following information:

- Table 1 – Decommissioning Cost Summary
- Table 2 – Decommissioning Annual Spend

2.1 Discussion of Decommissioning Periods

The following narrative describes the basic activities associated with decommissioning CR3. The DECON DCE is divided into phases or periods based upon major milestones within the project or significant changes in the projected expenditures. The following sub-sections correspond to the major decommissioning periods within the estimate. Further details regarding the DECON DCE are provided in Tables 1 and 2 in Attachment 1.

2.1.1 Period 2: ISFSI Operations

ISFSI construction was completed and the spent fuel was transferred from the spent fuel pool to horizontal storage modules located on the ISFSI pad adjacent to the former power block ahead of schedule and was completed in January 2018. DEF will continue final preparations for Dormancy until ADP assumes control of CR3, upon which time ADP will initiate decommissioning as described in 2.1.3 and 2.1.4. For the ADP DECON DCE, the ISFSI Operations Period commences after CR3 transfer to ADP.

ISFSI Operations activities include a 24-hour security force, preventive and corrective maintenance on security systems, area lighting, general building maintenance, routine radiological inspections and a site environmental and radiation monitoring program. Maintenance or vendor personnel, as appropriate, perform equipment maintenance, inspection activities, routine services to maintain safe conditions, adequate lighting, heating, and ventilation, and periodic preventive maintenance on essential site services. Following removal of SNF and GTCC from the ISFSI, the ISFSI pad will be decommissioned.

An environmental surveillance program will be carried out during the ISFSI Operations period to monitor any radiological impacts to the environment. The environmental surveillance program constitutes an abbreviated version of the program in effect during normal plant operations. Emergency planning exemptions are in effect based on analyses that indicate any releases beyond the exclusion area boundary are below the EPA Protective Action Guides exposure levels.

Security during the ISFSI Operations period will be conducted primarily to safeguard the spent fuel while on site and prevent unauthorized entry. The security fence, sensors, alarms, and other surveillance equipment provide security.

For planning purposes, ADP's current CR3 spent fuel management plan is based, in general, upon the following projections: 1) Assuming priority pickup for the spent fuel from shutdown reactors, a 2034 start date for the DOE initiating transfer of commercial spent fuel to a federal facility, 2) a corresponding 2036 date for beginning to remove spent fuel from CR3, and 3) a 2037 completion date for removal of all CR3 spent fuel, although transfer could occur earlier if the DOE is successful in implementing its current strategy for the management and disposal of spent fuel. The ISFSI will then be decommissioned.

2.1.2 Period 3: Preparations for Decommissioning

ADP will commence preparations for decommissioning after CR3 is transferred. Preparations are undertaken to reactivate site services and prepare for decommissioning. Preparations include engineering and planning, a detailed site characterization, and the assembly of a decommissioning management organization. Final planning for activities and the writing of activity specifications and detailed procedures are also initiated at this time.
At least two years prior to the anticipated date of license termination, a License Termination Plan (LTP) is required. Submitted as a supplement to the SAR or its equivalent, the plan must include: a site characterization, description of the remaining dismantling activities, plans for site remediation, procedures for the final radiation survey, designation of the end use of the site, an updated cost estimate to complete the decommissioning, and any associated environmental concerns. The NRC will notice the receipt of the plan, make the plan available for public comment, and schedule a local hearing. LTP approval will be subject to any conditions and limitations as deemed appropriate by the Commission.

2.1.3 Period 4: Decommissioning

This period includes the physical decommissioning activities associated with the removal and disposal of contaminated and activated components and structures, including the successful termination of the 10 CFR 50 operating license. Although the initial radiation levels due to ^{60}Co- decreased during the dormancy period, the internal components of the reactor vessel will still exhibit sufficiently high radiation dose rates to require remote sectioning under water since the ^{60}Co levels are still significant. Portions of the biological shield will also be radioactive due to the presence of activated trace elements with long half- lives (^{152}Eu and ^{154}Eu). Decontamination will require controlled removal and disposal. It is assumed that radioactive corrosion products on inner surfaces of piping and components will not have decayed to levels that will permit unrestricted use or allow conventional removal.

These systems and components will be surveyed as they are removed and disposed of in accordance with the existing radioactive release criteria.

Significant decommissioning activities in this phase include:

- Reconfiguration, revitalization, and modification of site structures and facilities, as needed, to support decommissioning operations. This may include establishing a centralized processing area to facilitate equipment removal and component preparation for offsite disposal. Modifications may also be required to the reactor building to facilitate equipment access, support the segmentation of the reactor vessel internals, and for large component extraction.
- Design and fabrication of temporary and permanent shielding to support removal and transportation activities, construction of contamination control envelopes, and the procurement of specialty tooling, as needed.
- Procurement (lease or purchase) of shipping canisters, cask liners, and industrial packages for the disposition of low-level radioactive waste (LLRW).
- Decontamination of components and piping systems, as required, to control (minimize) worker exposure.

- Removal of piping and components no longer essential to support decommissioning operations.
- Removal of control rod drive housings and the head service structure from the reactor vessel head, if required. Off-site shipping of the reactor vessel head with the control rod drive housings and head service structure in one-piece package might be envisioned.
- Removal, disassembly, and segmentation of the reactor internals, if necessary. The reactor internals include the plenum assembly and the core support assembly. Depending on packaging, some material may exceed Class C disposal requirements. Any such material will be packaged in modified fuel storage canisters and safely stored on the ISFSI. Segmentation will maximize the loading of the shielded transport casks (i.e., by weight and activity). The operations will primarily be conducted under water using remotely operated tooling and contamination controls.
- Removal of the reactor vessel. Appropriate ALARA considerations will be factored in during design phase and engineering controls will be implemented during segmentation and packaging activities to minimize the working area dose rates. For example, a shielded platform will be installed for reactor vessel segmentation as cutting operations will be performed in-air using remotely operated equipment within a contamination control envelope.
- Removal of the activated and contaminated portions of the concrete biological shield and accessible contaminated concrete surfaces. If dictated by the steam generator and pressurizer removal scenarios, those portions of the associated D-rings necessary for access and component extraction will be removed.
- Removal of remaining plant systems and associated components as they become non- essential to the decommissioning program or worker health and safety (e.g., waste collection and treatment systems, electrical power and ventilation systems).
- Removal of the steel liners from the refueling canal, disposing of the activated and contaminated sections as radioactive waste. Removal of any activated/contaminated concrete.
- Surveys of the decontaminated areas of the reactor building.
- Remediation and removal of the contaminated equipment and material from the auxiliary building and any other contaminated area. Radiation and contamination controls will be utilized until residual levels indicate that the structures and equipment can be released for unrestricted access and conventional demolition. This activity may necessitate the dismantling and disposition of most of the systems and components (both clean and contaminated) located within these buildings. This activity facilitates surface decontamination and subsequent verification surveys required prior to obtaining release for demolition.
- Routing of material removed in the decontamination and dismantling to a central processing area. Material certified to be free of contamination will be released for unrestricted disposition, e.g., as scrap, recycle, or general disposal. Contaminated material will be characterized and segregated for volume reduction, and waste treatment, and/or packaged for controlled disposal at a low-level radioactive waste disposal facility.

- Remediation of the West Settling Pond to meet the unrestricted release criteria in 10 CFR 20.1402. The DCE assumes that 500 cubic yards of contaminated soil will be shipped offsite as LLRW for disposal.
- Removal of contaminated underground piping. The DCE assumes that the Station Drain Tank line and the approximately 1,000-foot-long nitrogen line will be removed in order to meet license termination criteria.

Incorporated into the LTP is the Final Survey Plan. This plan identifies the radiological surveys to be performed once the decontamination activities are completed and is developed using the guidance provided in the "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)." This document incorporates the statistical approaches to survey design and data interpretation used by the Environmental Protection Agency (EPA). It also identifies state-of- the-art, commercially available instrumentation and procedures for conducting radiological surveys. Use of this guidance ensures that the surveys are conducted in a manner that provides a high degree of confidence that applicable NRC criteria are satisfied. Once the surveys are complete, the results are provided to the NRC in a format that can be verified. The NRC then reviews and evaluates the information, performs an independent confirmation of radiological site conditions, and makes a determination on the requested change to the operating license.

The NRC will terminate the operating license if it determines that site remediation has been performed in accordance with the LTP, and that the terminal radiation survey and associated documentation demonstrate that the facility is suitable for release.

2.1.4 Period 5: Site Restoration

Site restoration activities will begin with demolition of non-radiological buildings and structures outside the radiological controlled area. Structures within the power block will be removed to a nominal depth of three feet below the top grade of the embankment, wherever possible. This assumption was applied to the disposition of all CR3 facilities on the berm and, as a result, the general topography of the berm will be retained at the conclusion of site restoration.

The three-foot depth allows for the placement of gravel for drainage, as well as topsoil, so that vegetation can be established for erosion control. Site areas affected by the dismantling activities are restored and the plant area graded as required to prevent ponding and inhibit the refloating of subsurface materials.

Non-contaminated concrete rubble produced by demolition activities is processed to remove reinforcing steel and miscellaneous embedments. The processed material will then be used on site to backfill foundation voids. Excess non-contaminated materials will be trucked to an offsite area for disposal as construction debris.

Remediation of hazardous constituents will also be conducted during the site restoration phase. Soil containing lead residue will be excavated from the Firing Range and disposed of offsite.

2.2 General Decommissioning Considerations

2.2.1 Major Decommissioning Activities

As defined in 10 CFR 50.2, "Definitions," a "major decommissioning activity" is "any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components for shipment containing greater than class C waste in accordance with § 61.55." The following discussion provides a summary of the major decommissioning activities currently planned for CR3. These activities are envisioned to occur in Period 4 however, the schedule may be modified as conditions dictate.

Prior to starting a major decommissioning activity, the affected components will be surveyed and decontaminated, as required, in order to minimize worker exposure, and a plan will be developed for the activity. Shipping casks and other equipment necessary to conduct major decommissioning activities will be designed and procured.

The initial major decommissioning activities will focus on the removal, packaging and disposal of piping and components that are no longer essential to support decommissioning operations. Additional systems and associated components will be removed as they become non-essential to the reactor vessel removal operations, related decommissioning activities, or worker health and safety.

Following reactor vessel and cavity re-flood, the reactor vessel internals will be removed from the reactor vessel and segmented, if necessary, for packaging or to separate Greater Than Class C (GTCC) waste. The internals comprising the Core Barrel, Baffle Plates, Thermal Shield, Lower Grid and Upper Grid may need to be treated as GTCC waste, in which case the components will be segmented and packaged into dry shielded containers. ADP intends to pursue storage of GTCC containers on the ISFSI pad in Horizontal Storage Modules. Using this approach, the internals will be packaged and disposed of independent of the reactor vessel. When the internals segmentation effort is completed, the reactor vessel and cavity will be drained, and emptied.

Removal of the reactor vessel follows the removal of the reactor internals. Without the internals present, several options are available for the removal and disposal of the reactor vessel: segmentation, sectioning into larger pieces, or disposal as an intact package. It is likely that the components would be removed by sectioning or segmenting performed remotely in-air using cutting technology

Additional major decommissioning activities that would be conducted include the removal and disposal of the steam generators, pressurizer, and reactor coolant system. The dismantling of the containment structure would be undertaken as part of the reactor building demolition.

2.2.2 Other Decommissioning Activities

Secondary side piping and components in the intermediate building and turbine building may require disposal as LLRW due to steam generator tube leaks during operation. Numerous support systems in the Auxiliary Building will require disposal as LLRW.

2.2.3 Decontamination and Dismantlement Activities

The objectives of the decontamination effort are two-fold. The first objective is to reduce radiation levels throughout the facility in order to minimize personnel exposure during dismantlement.

The second objective is to clean as much material as possible thereby permitting demolition and disposal and minimizing the quantities of material that must be disposed of by burial as radioactive waste. The second objective will be achieved by decontaminating structural components including steel framing and concrete surfaces. The methods to accomplish this are typically mechanical, requiring the removal of the surface or surface coating, and are used regularly in industrial and contaminated sites. The need to decontaminate SSCs will be determined by the schedule to dismantle them and by plant conditions.
The decontamination and/or dismantlement of contaminated SSCs may be accomplished by decontamination in place, decontamination and dismantlement, or dismantlement and disposal. A combination of these methods may be utilized to reduce contamination levels, worker radiation exposures, and project costs. The methods chosen will be those deemed most appropriate for the particular circumstances. Material below the applicable radiological limits will be released for unrestricted disposition (e.g., scrap, recycle, or general disposal). Radioactively contaminated or activated materials will be removed from the site as necessary to allow the site to be released for unrestricted use.

LLRW will be processed in accordance with plant procedures and existing commercial options. Contaminated material will be characterized and segregated for controlled disposal at a LLRW disposal facility.

Contaminated concrete and structural steel components will be decontaminated and removed, as required, in order to gain access to contaminated and uncontaminated systems and components. After the systems and components are removed and processed as described above, the remaining contaminated concrete and structural steel components will be decontaminated and/or removed. Contaminated concrete will be packaged and shipped to a LLRW disposal facility. Contaminated structural steel components may be removed to a processing area for decontamination, volume reduction, and packaging for shipment to a processing facility or to a LLRW disposal facility, as necessary.

Buried and imbedded contaminated components (e.g., piping, drains, etc.) will be decontaminated in place or excavated and decontaminated. Appropriate contamination controls will be employed to minimize the spread of contamination and to protect personnel.

2.2.4 Radioactive Waste Management

A major component of the total cost of decommissioning CR3 is the cost of packaging and disposing of SSCs, contaminated soil, resins, water, and other plant process liquids. A waste management plan will be developed to incorporate the most cost-effective disposal strategy, consistent with regulatory requirements for each waste type. Currently, Class A, B, and C LLRW may be disposed of at the Waste Control Specialists site in Andrews County, Texas. If other licensed LLRW facilities become available, ADP may choose to use them as well. The waste management plan will be based on the evaluation of available methods and strategies for processing, packaging, and transporting radioactive waste in conjunction with the available disposal facility options and associated waste acceptance criteria.

2.2.5 Removal of Mixed Wastes

Mixed wastes and mixed wastes generated during decommissioning, if any, will be managed in accordance with applicable Federal and State regulations.

Mixed wastes from CR3 will be transported by authorized and licensed transporters and shipped to authorized and licensed facilities. If technology, resources, and approved processes are available, the processes will be evaluated to render the mixed waste non-hazardous.

2.2.6 Site Characterization

There are no changes to the information previously provided in this section.

2.2.7 Groundwater Protection and Radiological Decommissioning Records Program

There are no changes to the information previously provided in this section.

2.2.8 Changes to Management and Staffing

The ADP management team will be comprised of NorthStar, Orano, and incumbent site personnel, including DEF personnel who transfer to ADP team members after CR3 closure.

Throughout the decommissioning process, plant management and staffing levels will be adjusted to reflect the ongoing transition of the site organization.

3.0 SCHEDULE OF PLANNED DECOMMISSIONING ACTIVITIES

ADP intends to pursue the decommissioning of CR3 utilizing a DECON methodology. Work activities associated with the planning and preparation period began after the plant was permanently shut down. The schedule of spent fuel management and decommissioning activities is provided in Attachment 1, Table 1. ADP has made a reasonable determination that the funds in the nuclear decommissioning trust (NDT) for CR3 are adequate to complete decommissioning. ADP SF1 will provide all required funding for SNF management activities. ADP is submitting this Revised PSDAR to provide notification required by 10 CFR 50.82(a)(7) of the changes in activities and schedule to allow decontamination and dismantlement activities to proceed. Work activities associated with the planning and preparation period began before the plant was permanently shut down. The schedule duration (start and end dates) of spent fuel management and major decommissioning activities is provided in Attachment 1, Table 2.

The schedule recognizes that spent fuel will be retained in the ISFSI until it can be ultimately transferred to the DOE or safely moved to a Consolidated Interim Storage (CIS) Facility.

4.0 ESTIMATE OF DECOMMISSIONING AND SPENT FUEL MANAGEMENT COSTS

10 CFR 50.82(a)(8)(iii) requires that a site-specific DCE be prepared and submitted within two years following permanent cessation of operations. 10 CFR 50.82(a)(4)(i) requires that the PSDAR contain a site-specific DCE, including the projected cost of managing irradiated fuel. The 2013 PSDAR and site-specific DCE fulfilled the requirements of 10 CFR 50.82(a)(4)(i) and 10 CFR 50.82(a)(8)(iii). Duke submitted an updated CR3 DCE, in June 2018, to the NRC.

4.1 Cost Estimate

ADP has prepared a site-specific decommissioning cost estimate for CR3, which also provides projected costs of managing spent fuel, as well as non-radiological demolition and site restoration costs, accounted for separately. The ADP site-specific DCE summary is provided in Attachment 1, Table 1. An annual spending summary of the site-specific DCE and projected cost of managing spent fuel is provided in Attachment 1, Table 2.

The methodology used by ADP to develop its CR3 site-specific DECON DCE follows the basic approach originally advanced by the Atomic Industrial Forum (AIF) in its program to develop a standardized model for decommissioning cost estimates. The results of this program were published as AIF/NESP-036, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," (Reference 9). The AIF report presents a unit cost factor method for estimating direct activity costs, simplifying the estimating process. ADP utilizes the inventory based, bottoms-up, unit cost factor methodology with company specific labor and equipment productivity based on experience decommissioning commercial power reactors, university test reactors, and DOE Facilities and Sites. ADP also used quotes for unit-rates, subcontractors, and defined scopes of work. Analogous estimates were used for unique scopes of work where historical data exists. ADP applied contingency to all decommissioning costs to account for the inherent uncertainty in quantities, productivity, pricing, and schedules, and to ensure that funding is available for unforeseeable costs.

The ADP method for spent fuel management cost is primarily based on staffing levels and cost data from three (3) Northeast region ISFSI's, adjusted for site specific cost factors.

ADP has developed a team of industry leaders and initiated a series of Firm Fixed Price (FFP) and Fixed Unit Price (FUP) subcontracts to minimize the overall cost and schedule risk to the project. By accelerating the CR3 decommissioning and obtaining these FFP and FUP subcontracts, ADP has minimized the overall project risks.

4.2 Decommissioning Funds

Decommissioning costs will be paid for with funds from the site's Nuclear Decommissioning Trust (NDT) fund.

Under NRC regulations (10 CFR 50.82(a)(8)), a licensee must provide reasonable assurance that funds will be available (or "financial assurance") for decommissioning (i.e., license termination) costs. The regulations also describe the acceptable methods a licensee can use to demonstrate financial assurance. Funding for decommissioning CR3 currently is provided by an external trust held by DEF. ADP will continue this practice. The trust had a market value of approximately $731

million as of April 30, 2019. Further details regarding the financial assurance to be provided by ADP and financial qualifications of ADP are provided in the License Transfer Application submitted by DEF on June 14, 2019 (reference 4).

Adequate funding exists for decommissioning CR3. ADP intends to fund the expenditures for license termination and site restoration from the decommissioning trust fund currently held by DEF, pursuant to ADP's fixed price contract with DEF. Based on a timed cash flow analysis of the radiological decommissioning and site restoration costs, and assuming NDT returns at an annual 2% real, after tax rate of return, the minimum NDT fund balance is assured to fund the $540M period of performance decommissioning cost. Funding for SNF management is being provided by ADP SF1. ADP SF1 will fund ADP's SNF management activities and recover most of its costs from DOE. Its parent companies plan to provide the funding needed by ADP SF1, and over time ADP SF1 will accumulate funds from its parent companies that will be set aside for completing all the required SNF management activities. This commitment to ADP SF1 is backed by formal parental financial Support Agreements totaling $140 million.

10 CFR 50.82(a)(6)(iii) states that, "Licensees shall not perform any decommissioning activities," as defined in 10 CFR 50.2 that, "Result in there no longer being reasonable assurance that adequate funds will be available for decommissioning." ADP does not intend to perform any decommissioning activities that would jeopardize the availability of funds to complete decommissioning.

This PSDAR will not be updated for minor changes in anticipated decommissioning costs. However, the status of the decommissioning funding will continue to be reported to the NRC in accordance with 10 CFR 50.75(f)(1), "Reporting and recordkeeping for decommissioning planning." Additionally, ADP will inform the NRC in writing of any significant schedule and decommissioning cost changes per 10 CFR 50.82(a)(7) and provide an updated site-specific estimate of remaining decommissioning costs with the license termination plan per 10 CFR 50.82(a)(9)(ii)(F). If the funding assurance demonstration shows the NDT is not sufficient, then an alternate funding mechanism allowed by 10 CFR 50.75(e) and the guidance provided in Regulatory Guide 1.159 (Reference 10) will be put in place.

5.0 ENVIRONMENTAL IMPACTS

There are no changes to the information previously provided in this section.

5.1 Conclusions

Based on the information previously provided in this section, ADP concludes that the environmental impacts associated with planned CR3 site-specific decommissioning activities will be bounded by appropriate, previously issued environmental impact statements. Specifically, the environmental impacts are bounded by the GEIS (Reference 8).

1. The postulated impacts associated with the decommissioning method chosen, DECON, have already been considered in the most recent DSEIS and GEIS.
2. There are no unique aspects of CR3 or of the decommissioning techniques to be utilized that would invalidate the conclusions reached in the most recent DSEIS and GEIS.
3. The methods assumed to be employed to dismantle and decontaminate CR3 are standard construction-based techniques fully considered in the most recent DSEIS and GEIS.

Therefore, it can be concluded that the environmental impacts associated with the site-specific decommissioning activities for CR3 will be bounded by appropriate previously issued environmental impact statements.

10 CFR 50.82(a)(6)(ii) states that licensees shall not perform any decommissioning activities, as defined in 10 CFR 50.2, that result in significant environmental impacts not previously reviewed. No such impacts have been identified.

6.0 REFERENCES

1. Letter from J. Elnitsky, Vice President Crystal River Nuclear Plant, "Crystal River Unit 3 – Post-Shutdown Decommissioning Activities Report," dated December 2, 2013.

2. Letter from J. Elnitsky, Vice President Crystal River Nuclear Plant, "Crystal River Unit 3 – Post-Shutdown Decommissioning Activities Report – Response to Request for Additional Information," dated June 17, 2014.

3. Letter from M.D. Orenak, Project Manager, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, to T.D. Hobbs, General Manager, Crystal River Nuclear Plant, "Crystal River Unit 3 Nuclear Generating Plant Post-Shutdown Decommissioning Activities Report," dated March 11, 2015.

4. Letter from R. Reising, Senior Vice President, Duke Energy Corporation, "Application for Order Consenting to Direct Transfer of Control of Licenses and Approving Conforming License Amendment, dated June 14, 2019.

5. Regulatory Guide 1.185, "Standard Format and Content for Post-Shutdown Decommissioning Activities Report," Revision 1, dated June 2013.

6. Letter from J.A. Franke, Vice President, Crystal River Nuclear Plant, "Crystal River Unit 3 - Certification of Permanent Cessation of Power Operations and that Fuel Has Been Permanently Removed from the Reactor," dated February 20, 2013. (ADAMS Accession No. ML13056A005)

7. Letter from C. Gratton, Senior Project Manager, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, to J.A. Franke, Vice President, Crystal River Nuclear Plant, "Crystal River Unit 3 Nuclear Generating Plant Certification of Permanent Cessation of Operation and Permanent Removal of Fuel from the Reactor," dated March 13, 2013. (ADAMS Accession No. ML13058A380)

8. NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Supplement 1, Regarding the Decommissioning of Nuclear Power Reactors," Final Report dated November 2002.

9. AIF/NESP-036, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," dated May 1986.

10. Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," Revision 2, dated October 2011.

7.0 ATTACHMENT 1

Table 1 – Decommissioning Cost Summary

Thousands of Period of Performance Dollars

	TOTAL ADP COSTS - POST-CLOSING (2020-2037) (Includes ADP CR3 and SF1)				
	2020-2026	2020-2026	2020-2026	2020-2037	
	License Termination (10 CFR 50.75)	**Site Restoration** (Non 10 CFR 50.75 Costs)	**SubTotal**	**Spent Fuel Management** (10 CFR 50.54(bb))	**Total**
Facility Management	$76,056	$8,149	$84,204		$84,204
Decontamination and Decommissioning	$230,588	$25,090	$255,678	$0	$255,678
Large Component Removal	$97,423		$97,423	$12,953	$110,376
GTCC T&D			$0	$37,396	$37,396
Project Management	$95,844	$6,852	$102,696		$102,696
ISFSI Decommissioning			$0	$5,407	$5,407
Non-ISFSI O&M SubTotal	**$499,910**	**$40,090**	**$540,000**	**$55,755**	**$595,755**
ISFSI Operations & Fuel Mgt. (2020 - 2037)				**2020-2037**	
Facility Management				$207,846	$207,846
ISFSI to DOE Fuel Loading				$21,415	$21,415
ISFSI O&M SubTotal	**$0**	**$0**	**$0**	**$229,261**	**$229,261**
Total Decommissioning Costs	**$499,910**	**$40,090**	**$540,000**	**$285,016**	**$825,016**

Table 2 – Decommissioning Annual Spend Plan

Thousands of Period of Performance Dollars

	ANNUAL COST PROFILE (2020-2037) (Includes ADP CR3 and SF1)								
	Total ADP Costs								
	2020	2021	2022	2023	2024	2025	2026	(11 years) 2027-2037	TOTAL
Facility Management	$7,900	$14,855	$14,404	$13,812	$13,909	$9,069	$10,255		$84,204
Decontamination and Decommissioning	$23,606	$69,299	$27,852	$24,579	$69,448	$22,529	$18,365		$255,678
Large Component Removal	$0	$6,789	$66,136	$11,946	$12,551	$0	$0		$97,423
Project Management	$7,748	$17,413	$20,228	$20,573	$20,972	$9,876	$5,886		$102,696
Non-ISFSI O&M SubTotal	**$39,254**	**$108,356**	**$128,620**	**$70,909**	**$116,880**	**$41,474**	**$34,506**	**$0**	**$540,000**
ISFSI Operations & Spent Fuel Mgt. (2020 - 2037)									
Facility Management	$7,820	$7,976	$8,136	$8,298	$8,464	$8,634	$8,806	$149,712	$207,846
GTCC Packaging, Transportation, Disposal			$11,635	$1,319				$37,396	$50,349
ISFSI to DOE Fuel Loading								$21,415	$21,415
ISFSI Decommissioning								$5,407	$5,407
ISFSI O&M SubTotal	**$7,820**	**$7,976**	**$19,770**	**$9,617**	**$8,464**	**$8,634**	**$8,806**	**$213,929**	**$285,016**
Total Decommissioning Costs	**$47,074**	**$116,332**	**$148,390**	**$80,526**	**$125,345**	**$50,108**	**$43,313**	**$213,929**	**$825,016**

OPC EXH 13 000025 5003OZ

~~CONTAINS PROPRIETARY INFORMATION WITHHOLD UNDER 10 CFR § 2.390~~ 72-1035
(NOT PROPRIETARY WITHOUT ENCLOSURES 1P AND 2P ATTACHED)

DUKE ENERGY®

Crystal River Nuclear Plant
15760 W. Power Line Street
Crystal River, FL 34428
Docket 50-302
Docket 72-1035
Operating License No. DPR-72

10 CFR 50.80
10 CFR 50.90
10 CFR 72.50

June 14, 2019
3F0619-01

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Application for Order Consenting to Direct Transfer of Control of Licenses and Approving Conforming License Amendment

Dear Sir:

In accordance with Section 184 of the Atomic Energy Act, 10 CFR 50.80, and 10 CFR 72.50, Duke Energy Florida, LLC (DEF), on behalf of itself and ADP CR3, LLC (ADP CR3) (together, Applicants), respectfully requests that the U.S. Nuclear Regulatory Commission (NRC) consent to the direct transfers to ADP CR3 of DEF's licensed authority under Facility Operating License No. DPR-72 for the Crystal River Unit 3 Nuclear Generating Plant (CR-3) (the Facility License) and the general license for the CR-3 Independent Spent Fuel Storage Installation (ISFSI) (the Licenses) to possess, maintain, and decommission CR-3 and the ISFSI (collectively, the CR-3 Facility). The Applicants request that the NRC consent to these transfers so as to implement expedited decommissioning at CR-3. DEF will remain named as the NRC owner licensee. In addition, Applicants request that the NRC approve a conforming administrative amendment to the Facility License to reflect the proposed direct transfer of authority under the Facility License from DEF to ADP CR3.

ADP CR3 is a wholly owned subsidiary of Accelerated Decommissioning Partners, LLC (ADP), which is a joint venture of NorthStar Group Services, Inc. (NorthStar) (75%) and Orano Decommissioning Holdings LLC (Orano) (25%). Orano is owned by Orano USA LLC, which was formerly AREVA Nuclear Materials, LLC. NorthStar and Orano formed ADP to leverage their substantial collective experience relevant to decommissioning

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commercial nuclear reactors, to acquire control of reactor sites, and to execute prompt decommissioning.

DEF has entered into a Decommissioning Services Agreement (DSA) with ADP CR3, which provides that ADP CR3 will assume the role of licensee responsible for all activities conducted under the Licenses, upon NRC approval of the transfers to ADP CR3. ADP CR3 has agreed that it will decommission the CR-3 Facility under the terms of the DSA, and ultimately obtain termination of the Licenses, pursuant to a fixed price services arrangement. The fixed price is equal to a specified amount, and earnings thereon, in a segregated account being created in DEF's nuclear decommissioning trust fund (NDT). The NDT account will be used to decommission the CR-3 Facility, other than the ISFSI, and to achieve partial license termination on an accelerated schedule. DEF has agreed that it will direct the trustee of the NDT to disburse payments from this account each month based upon certifications from ADP CR3 that it has completed various scopes of decommissioning work up to the total amount available in the account. DEF will maintain a separate decommissioning reserve account within its NDT that will likely exceed $100 million.

The parties have also agreed that ADP SF1, LLC (ADP SF1), an affiliate of ADP CR3 also wholly owned by ADP, will enter into a Purchase and Sale Agreement with DEF, pursuant to which ADP SF1 will acquire the ISFSI and its associated equipment, and title to the CR-3 spent nuclear fuel, the high-level waste, and the greater than Class C waste at the CR-3 Facility. DEF will also assign to ADP SF1 its Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste with the U.S. Department of Energy (DOE). ADP SF1 will own, but not possess, the ISFSI and its associated equipment, the spent fuel and waste pursuant to the general license provided in 10 CFR 72.6(b). ADP CR3 will possess the ISFSI and its associated equipment, the spent fuel and waste under the Licenses. ADP SF1 will enter into an agreement with ADP CR3, under which ADP SF1 will pay ADP CR3 for all costs of operating, maintaining, and decommissioning the ISFSI, and for ultimately removing all material owned by ADP SF1 from the CR3 site. ADP SF1 intends to recover a substantial portion of these costs from DOE. ADP SF1 also will have access to funds provided by its parent companies to pay ADP CR3 for such costs pending ADP SF1's recovery of those costs from DOE.

ADP SF1 estimates that the current cost of decommissioning the ISFSI is $3.7 million, and ADP SF1 will establish a nuclear decommissioning trust fund for purposes of holding funds to decommission the ISFSI. At the time of the license transfer, ADP SF1 will provide financial assurance for ISFSI decommissioning using one of the methods set forth in 10 CFR 72.30(e). ADP SF1 may propose to deposit $3.95 million in the trust, which at the allowed 2% real rate of return would be projected to grow to the $5.4 million by 2037, when the ISFSI is expected to be decommissioned.

A simplified organization chart reflecting the current CR-3 licensee, DEF, and its owner is provided in Figure 1 following this letter. A simplified organization chart reflecting ADP CR3 and ADP SF1 is depicted in Figure 2. These organization charts are "simplified" in that they only show the companies in the chain of ownership of the licensee entities. After

the proposed transfers, DEF will continue to own the CR-3 Facility, as well as its associated assets and real estate (including its NDT), except for the ISFSI, the spent nuclear fuel, the high level waste, the greater than Class C waste and the associated storage canisters, which will be owned but not possessed by ADP SF1.

Information supporting this request for consent and approval is included in the attached "Application for Consent to Direct Transfer of Control of Licenses and Approval of Conforming License Amendment" (Application), which is provided as Attachment 1. In addition, a proposed conforming amendment is provided as a mark-up version in Attachment 2 and a clean version in Attachment 3. A no significant hazards consideration analysis is provided in Attachment 4.

These transfers are desirable and of considerable benefit to the citizens of Florida, because they will result in the decommissioning of the CR-3 Facility, and the release of all portions of the site other than the ISFSI on an accelerated schedule. Currently, DEF has selected the SAFSTOR method of decommissioning CR-3, and its current decommissioning plans, as described in its 2013 Post Shutdown Decommissioning Activities Report (PSDAR), assume the completion of radiological decommissioning by 2073 and site restoration by 2074. Under the terms of the proposed transaction, ADP CR3 would become responsible under the Licenses for all licensed activities at the CR-3 Facility. ADP CR3 would begin decommissioning activities promptly and would plan to complete radiological decommissioning and restoration of the non-ISFSI portions of the CR-3 site in 2027.

ADP CR3 has analyzed the remaining expected costs of decommissioning, including the expected annual cash flows, and it believes that with conservative NDT investments that are designed to assure the preservation of the fund to be available for prompt decommissioning, the funds available to ADP CR3 in the NDT account will be sufficient to pay all of the annual expected costs of decommissioning the CR-3 Facility. This is based on the estimate of the remaining expected costs of decommissioning. Further, the major decommissioning work will be performed under fixed price or fixed unit contracts, subject to performance bonds (or insurance, where appropriate) issued by qualified surety companies to guarantee the performance of the tasks, and with withdrawals from the NDT limited under a decommissioning pay-item approach, which reasonably assures completion of the work within the cost estimates. In addition, under this approach, any cost overruns on one task do not affect the funds remaining in the NDT to pay for the completion of other tasks.

The financial assurance required by 10 CFR 50.75 and 10 CFR 50.82(a)(8)(vi) for decommissioning the CR-3 Facility will be provided by DEF using the prepayment method in accordance with 10 CFR 50.75(e)(1)(i). In addition, NorthStar and Orano will provide parental financial Support Agreements to ADP CR3 in the total amount of $140 million to assure that ADP CR3 is able to meet its financial and regulatory obligations to possess, maintain, and decommission the CR-3 Facility within the fixed price agreement and to comply with all NRC requirements until the Licenses are terminated. The $140 million Support Agreements will also assure ADP SF1's ability to fund its obligations to ADP

CR-3. Based upon its ability to fund decommissioning from the NDT under the terms of the DSA, the pay-item approach, performance bonds, the parental Support Agreements, and funds provided by ADP SF1, ADP CR3 will be financially qualified to perform its obligations under the Facility Licenses.

The information in the attached Application demonstrates: (1) the proposed transfer of DEF's possession, maintenance, and decommissioning authority under the Licenses to ADP CR3 will accelerate the timely decommissioning of the CR-3 site; (2) ADP CR3 has the requisite managerial, technical, and financial qualifications to perform its obligations under the Licenses; (3) the DEF NDT provides reasonable assurance of funding for decommissioning the CR-3 Facility; (4) the material terms of the Licenses will not be affected; and (5) the transfers requested in the Application will not result in any impermissible foreign ownership, control or domination.

In parallel with the NRC's review of this Application, ADP CR3 plans to prepare and submit an updated PSDAR, reflecting ADP CR3's plans for accelerated decommissioning following the proposed transfers of authority under the Licenses that will become effective after license transfer.

The Applicants respectfully request that the NRC review and complete action expeditiously on the enclosed Application and consent to the proposed transfers. We are prepared to work closely with the NRC Staff to facilitate the review of the Application. Applicants request that the NRC issue an Order by December 31, 2019 approving the amendments to the Facility License and authorizing the transfers to take place at any time through December 31, 2020. Applicants also request that the license amendment be made effective as of the date the transfers are completed. DEF will notify the NRC staff at least 2 business days prior to the expected closing date for the transaction.

There are certain regulatory filings and approvals beyond that of the NRC which must be made and obtained prior to the closing of the proposed transaction, including Florida Public Service Commission approval. Applicants will keep the NRC informed of any significant changes in the status of other required approvals or developments that could have an impact on the closing date.

In summary, the proposed transfers will not be inimical to the common defense and security or result in any undue risk to public health and safety, and the transfers will be consistent with the requirements of the Atomic Energy Act and the NRC regulations.

Separately bound Enclosures 1P and 2P of the Application contain confidential commercial and financial information. The Applicants request that this information be withheld from public disclosure pursuant to 10 CFR § 2.390, as described in the Affidavit provided in Attachment 5. A redacted version of these documents, suitable for public disclosure, is provided as Enclosures 1 and 6 to Attachment 1.

In accordance with 10 CFR 50.91(b)(1), a copy of this submittal has been sent to the State of Florida.

In the event that the NRC has any questions about the proposed transaction described in this letter and in the Application or wishes to obtain any additional information about the proposed transfers, please contact Phyllis Dixon of DEF at 352-501-3355 or phyllis.dixon@duke-energy.com, or contact Gregory G. DiCarlo of NorthStar Group Services, Inc. at 203-222-0584 x3051 or GDiCarlo@NorthStar.com.

Service upon the Applicants of any notices, comments, hearing requests, intervention petitions, or other pleadings should be made to:

For DEF:

Tracey M. LeRoy
Duke Energy Corporation
550 South Tryon Street
Mail Code DEC45A
Charlotte, NC 28202
Phone: 704-382-8317
E-mail: Tracey.Leroy@duke-energy.com

John E. Matthews
Grant W. Eskelsen
Morgan, Lewis & Bockius LLP
1111 Pennsylvania Ave., NW
Washington, D.C. 20005
Phone: 202-739-5524
E-mail: john.matthews@morganlewis.com
E-mail: grant.eskelsen@morganlewis.com

For ADP CR3:

Gregory G. DiCarlo
NorthStar Group Services, Inc.
Vice President & General Counsel
35 Corporate Drive, Suite 1155
Trumbull, CT 06611
Phone: 203-222-0584 x3051
E-mail: GDiCarlo@NorthStar.com

Michael G. Lepre
Timothy J.V. Walsh
Pillsbury Winthrop Shaw Pittman LLP
1200 Seventeenth Street, NW
Washington, DC 20036
Phone: 202.663.8193
E-mail: michael.lepre@pillsburylaw.com
E-mail: timothy.walsh@pillsburylaw.com

In addition, please place the above individuals on the NRC correspondence distribution for all correspondence related to the Application.

This correspondence contains no new regulatory commitments of DEF.

I declare under penalty of perjury that the foregoing regarding DEF is true and correct. Executed on June 14, 2019.

Sincerely,

Ronald Reising, Senior Vice President
Operations Support

Enclosures: Figure 1 – Simplified Organization Chart (Current)

Figure 2 – Simplified Organization Chart (Post-Transfer)

Attachment 1 – Application for Order Approving License Transfer and Conforming License Amendments (NRC Facility Operating License No. DPR-72)

Attachment 2 – Facility Operating License (Changes)

Attachment 3 – Facility Operating License (Clean Pages)

Attachment 4 – No Significant Hazards Determination

Attachment 5 – Affidavit Supporting Request for Withholding

xc:

NMSS Project Manager (w/ all enclosures)
Regional Administrator, Region I (w/enclosures, except Enclosures 1P and 2P)
State of Florida (w/enclosures, except Enclosures 1P and 2P)

STATE OF Colorado)
) SS.
CITY Arapahoe)

Scott E. State, being duly sworn according to law deposes and says:

I am Chief Executive Officer, NorthStar Group Services, Inc. and Accelerated Decommissioning Partners, LLC (ADP), and as such, I am familiar with the contents of this correspondence and the attachments thereto concerning the Crystal River Unit 3, Nuclear Generating Plant and the matters set forth therein regarding ADP and its affiliated companies are true and correct to the best of my knowledge, information and belief.

Scott E. State

Subscribed and Sworn to before me

this 12 day of June, 2019

Angela R Desautell

Notary Public of Colorado

ANGELA R DESAUTELL
NOTARY PUBLIC - STATE OF COLORADO
NOTARY ID 20044043429
MY COMMISSION EXPIRES DEC 6, 2020

Figure 1: SIMPLIFIED ORGANIZATION CHART

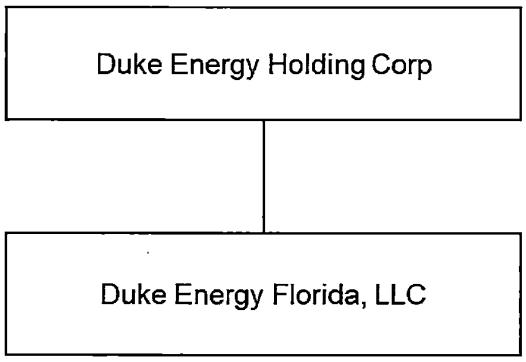
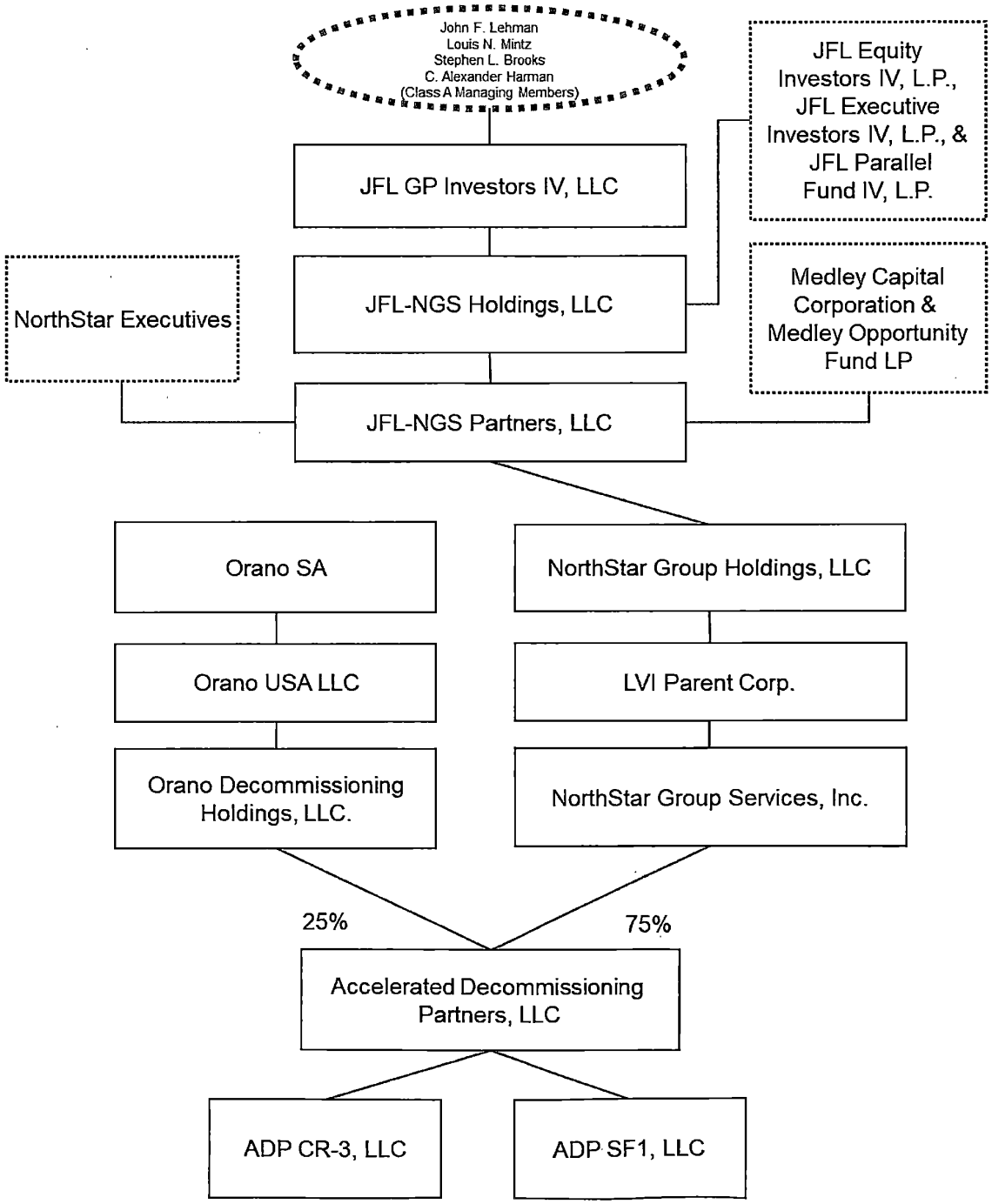


Figure 2: SIMPLIFIED ORGANIZATION CHART



DUKE ENERGY FLORIDA, LLC

DOCKET NUMBER 50 – 302 / DOCKET NUMBER 72 – 1035
LICENSE NUMBER DPR-72

ATTACHMENT 5

2.390 AFFIDAVITS

Affidavit of Ronald Reising

I, Ronald Reising, Senior Vice President, Operations Support Duke Energy Florida, LLC, do hereby affirm and state:

1. I am authorized to execute this affidavit on behalf of Duke Energy Florida, LLC (DEF);

2. DEF requests that Enclosures 1P and 2P, which are being submitted under separate cover and labeled "CONFIDENTIAL INFORMATION SUBMITTED UNDER 10 CFR 2.390", be withheld from public disclosure under the provisions of 10 CFR 2.390(a)(4).

3. Enclosures 1P and 2P contain confidential commercial information, the disclosure of which would adversely affect DEF.

4. This information has been held in confidence by DEF. To the extent that DEF has shared this information with others, it has done so on a confidential basis.

5. DEF customarily keeps such information in confidence, and there is a rational basis for holding such information in confidence. The information is not available from public sources and could not be gathered readily from other publicly available information.

6. Public disclosure of this information would cause substantial harm to DEF's business interests because such information has significant commercial value to DEF and its disclosure could adversely affect other DEF transactions.

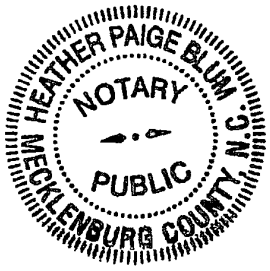
Ronald D

Ronald Reising
Senior Vice President
Operations Support

Subscribed and sworn before me, Heather Paige Blum
a Notary Public
this 14 day of June, 2019.

Heather Paige Blum

My commission expires: 1/9/2023



Affidavit of Scott E. State

I, Scott E. State, CEO of NorthStar Group Services, Inc. and Accelerated Decommissioning Partners, LLC (collectively, ADP) do hereby affirm and state:

1. I am authorized to execute this affidavit on behalf of ADP (ADP);
2. ADP requests that Enclosure 1P and 2P, which are being submitted under separate cover and labeled "CONFIDENTIAL INFORMATION SUBMITTED UNDER 10 CFR 2.390", be withheld from public disclosure under the provisions of 10 CFR 2.390(a)(4).
3. Enclosures 1P and 2P contain confidential commercial information, the disclosure of which would adversely affect ADP.
4. This information has been held in confidence by ADP. To the extent that ADP has shared this information with others, it has done so on a confidential basis.
5. ADP customarily keeps such information in confidence, and there is a rational basis for holding such information in confidence. The information is not available from public sources and could not be gathered readily from other publicly available information.
6. Public disclosure of this information would cause substantial harm to ADP's business interests because such information has significant commercial value to ADP and its disclosure could adversely affect other ADP transactions.

Scott E. State

Subscribed and sworn before me,
a Notary Public
this 12 day of June, 2019.

ANGELA R DESAUTELL
NOTARY PUBLIC - STATE OF COLORADO
NOTARY ID 20044043429
MY COMMISSION EXPIRES DEC 6, 2020

DUKE ENERGY FLORIDA, LLC

DOCKET NUMBER 50 – 302 / DOCKET NUMBER 72 – 1035
LICENSE NUMBER DPR-72

ATTACHMENT 1

APPLICATION FOR ORDER CONSENTING TO DIRECT TRANSFER OF CONTROL OF LICENSES AND APPROVING CONFORMING LICENSE AMENDMENT

CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT

ATTACHMENT 1

**Application for Order Consenting to
Direct Transfer of Control of Licenses
and Approving Conforming License Amendment
(NRC Facility Operating License No. DPR-72 and
General License for Independent Spent Fuel Storage Installation)**

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Enclosure 1 Decommissioning Services Agreement (Non-Proprietary Version)

Enclosure 2 General Corporate Information Regarding ADP CR3, LLC and its Corporate Parents

Enclosure 3 Project Organization and Resumes of Key Management Personnel

Enclosure 4 Schedule & Financial Information for Decommissioning

Enclosure 5 Form of Fourth Amendment to Amended and Restated Nuclear Decommissioning Trust Agreement

Enclosure 6 Form of Support Agreements

Enclosure 1P Decommissioning Services Agreement (Proprietary Version)

Enclosure 2P Form of Support Agreements (Proprietary Version)

1. Introduction

In accordance with Section 184 of the Atomic Energy Act, 10 CFR 50.80, and 10 CFR 72.50, Duke Energy Florida, LLC (DEF), on behalf of itself and ADP CR3, LLC (ADP CR3) (together, Applicants), respectfully requests that the U.S. Nuclear Regulatory Commission (NRC) consent to the direct transfers to ADP CR3 of DEF's licensed authority under Facility Operating License No. DPR 72 for the Crystal River Unit 3 Nuclear Generating Plant (CR-3) (the Facility License) and the general license for the CR-3 Independent Spent Fuel Storage Installation (ISFSI) (the Licenses) to possess, maintain, and decommission CR3 and the ISFSI (collectively the CR-3 Facility). The Applicants request that the NRC consent to these transfers so as to implement expedited decommissioning at CR-3. DEF will remain named as the NRC owner licensee. In addition, Applicants request that NRC approve a conforming administrative amendment to the Facility License to reflect the proposed direct transfer of authority under the Facility License from DEF to ADP CR3.

ADP CR3 is a wholly owned subsidiary of Accelerated Decommissioning Partners, LLC (ADP), which is a joint venture of NorthStar Group Services, Inc. (NorthStar) (75%) and Orano Decommissioning Holdings LLC (Orano) (25%). Orano is owned by Orano USA LLC, which was formerly AREVA Nuclear Materials, LLC. NorthStar and Orano formed ADP to leverage their substantial collective experience relevant to decommissioning commercial nuclear reactors, to acquire control of reactor sites, and to execute prompt decommissioning.

DEF has entered into a Decommissioning Services Agreement (DSA) with ADP CR3, which provides that ADP CR3 will assume the role of licensee responsible for all activities conducted under the Licenses, upon NRC approval of the transfers to ADP CR3. ADP CR3 has agreed that it will decommission the CR-3 Facility under the terms of the DSA, and ultimately obtain termination of the Licenses, pursuant to a fixed price services arrangement. The fixed price is equal to a specified amount, and earnings thereon, in a segregated account being created in DEF's nuclear decommissioning trust fund (NDT). The NDT account will be used to decommission the CR-3 Facility, other than the ISFSI, and to achieve partial license termination on an accelerated schedule. DEF has agreed that it will direct the trustee of the NDT to disburse payments from this account each month based upon certifications from ADP CR3 that it has completed various scopes of decommissioning work up to the total amount available in the account. DEF will maintain a separate decommissioning reserve account within its NDT that will likely exceed $100 million.

The parties have also agreed that ADP SF1, LLC (ADP SF1), an affiliate of ADP CR3 also wholly owned by ADP, will enter into a Purchase and Sale Agreement with DEF, pursuant to which ADP SF1 will acquire the ISFSI and its associated equipment, and title to the CR-3 spent nuclear fuel, the high-level waste, and the greater than Class C waste at the CR-3 Facility. DEF will also assign to ADP SF1 its Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste ("Standard Contract") with the U.S. Department of Energy (DOE). ADP SF1 will own, but not possess, the spent fuel and waste pursuant to the general license provided in 10 CFR 72.6(b). ADP CR3 will possess the spent fuel and waste under the Licenses. ADP SF1 will enter into an

agreement with ADP CR3, under which ADP SF1 will pay ADP CR3 for all costs of operating, maintaining, and decommissioning the ISFSI, and for ultimately removing all material owned by ADP SF1 from the CR3 site. ADP SF1 intends to recover a substantial portion of these costs from DOE. ADP SF1 also will have access to funds provided by its parent companies to pay ADP CR3 for such costs pending ADP SF1's recovery of those costs from DOE.

A simplified organization chart reflecting the current CR-3 licensee, DEF, and its owner is provided in Figure 1. A simplified organization chart reflecting ADP CR3 and ADP SF1 is provided in Figure 2. These organization charts are "simplified" in that they only show the companies in the chain of ownership of the licensee entities. After the proposed transfers, DEF will continue to own the CR-3 Facility, as well as its associated assets and real estate (including its NDT), except for the ISFSI, the spent nuclear fuel, the high level waste, the greater than Class C waste and the associated storage canisters, which will be owned but not possessed by ADP SF1.

CR-3 was a commercial electric power plant that was part of the larger Crystal River Energy Complex, located on the Gulf of Mexico in Citrus County, Florida. CR-3 received its Construction Permit on September 25, 1968 and its Operating License on January 28, 1977. CR-3 began commercial operations on March 13, 1977. CR-3 shut down on September 26, 2009, as part of a planned refueling and steam generator replacement outage. Twice during the course of the extended refueling outage, CR-3's fuel assemblies were offloaded to the spent fuel pool. The second offload was due to the identification of additional damage to the concrete containment building beyond that initially included in the planned repair of damage that occurred while creating an access

port as part of the steam generator replacement project. The final removal of all fuel from the reactor vessel was completed on May 28, 2011. On February 5, 2013, after a comprehensive analysis, DEF's predecessor, Progress Energy Florida, a subsidiary of Duke Energy, announced that it would retire CR-3. On February 20, 2013, (ADAMS Accession No. ML13056A005), Progress Energy Florida certified to the NRC that it had permanently removed all fuel from the reactor vessel and permanently shut down the plant.

DEF submitted its Post Shutdown Decommissioning Activities Report (PSDAR) (ADAMS Accession No. ML13340A009), including its Site-Specific Decommissioning Cost Estimate (DCE) (ML13343A178), to the NRC on December 2, 2013. The NRC held a public meeting in Crystal River, Florida, on January 16, 2014 to discuss the PSDAR. Following the receipt and review of comments from stakeholders, the NRC staff accepted the PSDAR on March 11, 2015 (ADAMS Accession No. ML14321A751). On January 26, 2015, the NRC issued exemptions from the requirements of 10 CFR 50.82(a)(8(i)(A) and 10 CFR 50.75(h)(2) that allowed the use of funds from CR3's decommissioning trust for irradiated fuel management and site restoration costs (ADAMS Accession No. ML14247A545). Transfer of the CR-3 spent fuel into the ISFSI was completed on January 12, 2018. On January 15, 2018, DEF certified to the NRC that all of the spent fuel had been removed from the CR-3 spent fuel pool (ADAMS Accession No. ML18015A006).

The financial assurance required by 10 CFR 50.75 and 10 CFR 50.82(a)(8)(vi) for decommissioning CR3 will be provided by DEF using the prepayment method in accordance with 10 CFR 50.75(e)(1)(i). In addition, NorthStar and Orano will provide parental financial Support Agreements to ADP CR3 in the total amount of $140 million to

assure that ADP CR3 is able to meet its financial and regulatory obligations to maintain and decommission the CR3 Facility within the fixed price agreement and to comply with all NRC requirements until the Licenses are terminated. The $140 million Support Agreements will also assure ADP SF1's ability to fund its obligations to ADP CR-3. Where subcontractors are used to support decommissioning work, ADP CR3 will establish fixed price contracts, when possible. Each subcontractor under such fixed price subcontracts will post payment and performance bonds issued by surety issuer(s) in the amount of the fixed subcontract price. Based upon its ability to fund decommissioning from the NDT under the terms of the DSA, the pay item approach, performance bonds, the parental Support Agreements, and funding from ADP SF1, ADP CR3 will be financially qualified to perform its obligations under the Licenses.

This Application demonstrates that: (1) the proposed transfers of DEF's possession, maintenance, and decommissioning authority under the Licenses to ADP CR3 will accelerate the timely decommissioning of the CR-3 site; (2) ADP CR3 has the requisite managerial, technical, and financial qualifications to perform its obligations under the Licenses; (3) the DEF NDT provides reasonable assurance of funding the decommissioning of the CR-3 Facility; (4) the material terms of the Licenses will not be affected; and (5) the transfers requested in this Application will not result in any impermissible foreign ownership, control or domination.

In parallel with the NRC's review of this Application, ADP CR3 plans to prepare and submit an updated PSDAR, reflecting ADP CR3's plans for accelerated decommissioning following the proposed transfers of authority under the Licenses.

Applicants also request NRC approval of administrative amendments to conform

the Facility License to reflect the proposed transfer. These amendments are set forth in Attachment 2 to the transmittal letter that accompanies this Application. Administrative changes to documents other than the Facility License, such as the Physical Security Plan and Emergency Plan, will be necessary upon ADP CR3's assumption of control over the CR-3 Facility. Changes to such documents will be reported in a timely fashion in accordance with NRC regulations, such as 10 CFR 50.71(e), 10 CFR 50.54(p) and 10 CFR 50.54(q).

In summary, the proposed transfers will not be inimical to the common defense and security or result in any undue risk to public health and safety, and the transfers will be consistent with the requirements of the Atomic Energy Act and the NRC regulations.

2. Statement of Purpose of Transfers and Nature of the Transaction Making the Transfers Necessary or Desirable

The purpose of the proposed transfers is to permit the accelerated radiological decommissioning of CR-3. ADP CR3 will assume control of, and managerial responsibility for, all licensed activities, including decommissioning of CR-3 and its associated buildings and structures. ADP CR3 will be licensed to possess, maintain, and decommission CR-3 and the CR-3 ISFSI. These transfers are desirable and of considerable benefit to the citizens of Florida, because they will result in the decommissioning of the CR-3 Facility and release of all portions of the site, other than the ISFSI, on an accelerated schedule. Currently, DEF has selected the SAFSTOR method of decommissioning CR-3, and its current decommissioning plans, as described in its 2013 Post Shutdown Decommissioning Activities Report (PSDAR), assume the completion of radiological decommissioning by 2073 and site restoration by 2074.

Under the terms of the proposed transaction, ADP CR3 would become responsible under the Licenses for all licensed activities at the CR-3 site, including the ISFSI. ADP CR3 would begin decommissioning activities promptly, and would plan to complete radiological decommissioning and restoration of the non-ISFSI portions of the CR-3 site by 2027. Further, the transaction will place licensed responsibility in an organization focused on radiological decommissioning. ADP CR3 will draw on the experience of individuals from its parent companies, NorthStar and Orano, as well an affiliate of NorthStar – Waste Control Specialists, LLC (WCS).

NorthStar has extensive experience conducting environmental remediation activities. It is an industry leader in the decommissioning of large scale industrial and commercial complexes, with experience in decommissioning nuclear facilities in the U.S. and abroad. NorthStar is currently decommissioning the Vermont Yankee Nuclear Power Station (VY). In addition, ADP CR3 will contract with WCS, in order to take advantage of WCS's waste transportation and disposal experience and knowledge of best practices. WCS is a leader in low-level radioactive waste management, packaging, transportation and disposal. It operates radioactive and hazardous waste disposal facilities in Texas, and it has experience with on-site waste processing, management, packaging and loading. WCS is owned by the J.F. Lehman private equity funds that own NorthStar. NorthStar's Chief Executive Officer (CEO) is also the CEO of both ADP and WCS.

Orano participates in the global nuclear industry, and it has substantial experience and expertise overseeing spent nuclear fuel, the segmentation of reactor pressure vessels and internals, radioactive waste management, nuclear materials transportation, and other decommissioning work in the United States, France, Canada, the United

Kingdom, Germany and Japan. Orano has more than twenty years' experience in radiological decommissioning work and possesses the depth and breadth of resources necessary to perform such work.

3. General Corporate Information Regarding ADP CR3 and its Parent Companies

a. General Corporate Information and Description of Business

General corporate information regarding ADP CR3 and its corporate parents is provided in Enclosure 2. ADP CR3 is a wholly owned subsidiary of ADP, which is 75% owned and controlled by NorthStar. The other non-controlling 25% interest in ADP is owned by Orano Decommissioning Holdings, which is owned by Orano USA LLC, which is owned by Orano SA, a French Société Anonyme,[1] which is majority owned by the French State.

NorthStar Group Holdings, LLC (Holdings) is the ultimate parent company for the NorthStar business, and Holdings in turn is owned and controlled by the J.F. Lehman private equity funds. Holdings is owned and controlled by JFL-NGS Partners, LLC, which is controlled by JFL-NGS Holdings, LLC, which is controlled by JFL GP Investors IV, LLC. Ultimately, control is exercised by four U.S. citizens, John F. Lehman, Louis N. Mintz, Stephen L. Brooks, and C. Alexander Harman, who are the managing members of JFL GP Investors IV, LLC.

The majority of the equity interests in JFL-NGS Partners, LLC are held indirectly by three J.F. Lehman & Company private equity funds: (i) JFL Equity Investors IV, L.P.; (ii) JFL Executive Investors IV, L.P.; and (iii) JFL Parallel Fund IV, L.P. (the Funds). The

[1] A Société Anonyme is a public limited company similar to a corporation under U.S. law.

Funds are managed and controlled by their general partner, JFL GP Investors IV, LLC, which also controls JFL-NGS Partners, LLC. In addition, Medley Capital Corporation and Medley Opportunity Fund LP (collectively Medley) also now hold non-controlling equity interests in JFL-NGS Partners, LLC, and non-controlling equity interests in JFL-NGS Partners, LLC may in the future be issued to certain NorthStar executives.

b. No Foreign Ownership, Control or Domination

As noted above, NorthStar is privately held, and ultimately, control is exercised by four U.S. citizens, John F. Lehman, Louis N. Mintz, Stephen L. Brooks, and C. Alexander Harman, who are the managing members of JFL GP Investors IV, LLC. Each of the funds has multiple limited partnership investors, who are passive investors. The passive investors may include foreign investors, but NorthStar is not aware of any foreign passive investor that holds more than 5% of the indirect ownership interests of NorthStar. Moreover, the passive investors are not able to exercise control over either the private equity funds or NorthStar. Although Orano is ultimately majority owned by a foreign state, Orano only owns 25% of ADP, and it is not able to exercise control over ADP. As such, there is no reason to believe that ADP CR3 will be owned, controlled or dominated by any foreign person.

ADP CR3 believes negation action measures are not necessary, because it will not be engaging in any production or utilization activities. CR-3 is no longer legally or physically able to engage in production or utilization activities. Prior NRC staff action suggests that enforcement of the statutory foreign ownership, control or domination (FOCD) prohibition is unnecessary for such licensees. For example, the NRC staff has proposed to amend the provisions of 10 CFR 50.38 to make clear that the FOCD

restrictions no longer apply when a production or utilization facility is no longer legally or physically able to operate. *See* "Proposed Rule: Regulatory Improvements for Production and Utilization Facilities Transitioning to Decommissioning (RIN 3150-AJ59)," SECY-18-0055, Enclosure 1, pages 172-181 (May 7, 2018). The NRC staff has also granted exemptions from 10 CFR 50.38 to the Maine Yankee Atomic Power Company, Connecticut Yankee Atomic Power Company, and Yankee Atomic Electric Company, which held 10 CFR Part 50 licenses for Maine Yankee Atomic Power Station, Haddam Neck Plant, and Yankee Nuclear Power Station, respectively. 78 FR 58571 (Sept. 24, 2013). The NRC staff reasoned that since these facilities were no longer production or utilization facilities, the FOCD restriction need not apply. Accordingly, ADP CR3 believes that negation measures for a 25% foreign owner of the entity that will decommission CR-3 are unnecessary.

c. No Agency

As the licensed entity with possession and responsibility for managing and decommissioning CR-3, ADP CR3 will act for itself and on behalf of DEF, as its agent. Neither ADP CR3 nor DEF is acting as the agent or representative of any other person in the proposed transfers of the Licenses.

4. Technical Qualifications

ADP CR3 will be technically qualified to carry out its responsibilities as the licensee responsible for the CR-3 Facility. ADP CR3 will perform the decommissioning, decontamination and site restoration work by leveraging the experience of its parent companies and existing plant staff. NorthStar has more than 30 years of experience as a general decommissioning contractor on commercial and industrial projects while

performing decontamination and decommissioning (D&D) work, including on asbestos projects. Through its subsidiaries, NorthStar holds the NRC License for VY, and it is responsible for the accelerated decommissioning of VY.

Orano has more than twenty years' experience in radiological work, including overseeing spent nuclear fuel, the segmentation of reactor pressure vessels and internals, radioactive waste management, nuclear materials transportation, and other decommissioning work in the United States, France, Canada, the United Kingdom, Germany and Japan.

As shown on the organization chart(s) provided in Enclosure 3, ADP CR3 intends to staff technical support positions that are important to the safe storage of fuel and conduct of radiological protection with key members of the existing CR3 plant staff who are already trained and qualified and would fill positions with responsibilities analogous to their pre-license transfer responsibilities. The organizational staffing levels after the transfer will be comparable to the expected evolution of the existing SAFSTOR organization, and will be aligned with that appropriate for a decommissioning plant with all fuel in dry storage and dormant former power block buildings, while assuring that sufficient qualified resources are available to fully meet the requirements of the facility Licenses and applicable NRC regulations.

a. Nuclear Organization

When the proposed transfers become effective, ADP CR3 will assume responsibility for and control over the CR-3 site. The ADP CR3 project organization ultimately will report to NorthStar's CEO, Scott E. State, who is a licensed nuclear engineer and has extensive experience working in the nuclear industry and on

environmental remediation projects. An Executive Committee will be established that will include senior management level executives from NorthStar and Orano to provide experienced strategic and technical oversight of the D&D work: Scott E. State, P.E. from NorthStar, Sam Shakir from Orano, Frederic Bailly from Orano, and Greg DiCarlo from NorthStar. Resumes for these key executives are provided in Enclosure 3.

ADP CR3 employees and contractors will not be employed without being qualified for their positions in accordance with the applicable Quality Assurance Program and regulatory requirements, including Regulatory Guide 1.8, "Qualification and Training of Personnel for Nuclear Power Plants."

ADP CR3 will also adopt the existing Quality Assurance (QA), emergency preparedness, radiological protection, security, and training procedures and establish these functions using parent company personnel, existing incumbent personnel, as well as qualified contractors.

An organization chart showing the planned project organization is provided in Enclosure 3. Resumes for key management personnel are also provided in Enclosure 3. The organization will provide:

1) A single Vice President and Decommissioning Program Manager (VP/PM) accountable for overall management, leadership, performance, nuclear safety, QA and employee safety (John Hager).

2) Several managers with responsibilities for radiological safety, industrial health and safety, fuel storage, regulatory affairs, quality assurance, licensing, environmental, reactor pressure vessel segmentation, large component removal, decontamination and decommissioning, engineering and operations, waste operations,

project administration and financial services, and project controls will report to the VP/PM. This organization will provide a nuclear management team with control over the decontamination and decommissioning operations.

An ISFSI Manager with similar roles and responsibilities as that planned for the senior management position in the next evolution of the existing licensee organization will be the senior manager in the ADP CR3 technical support organization responsible for day to day operations, and will report to the VP/PM. The ISFSI Manager will be responsible for maintaining a trained and qualified staff to support the safe and secure storage of fuel, as well as the performance of required ISFSI maintenance and surveillance activities. The ISFSI Manager will also be responsible for assuring compliance with the 10 CFR Part 50 License and applicable regulations and for implementation of the site's Security, Emergency, and QA Programs. The individual filling this position will be required to have extensive knowledge of ISFSI related 10 CFR Parts 50 and 72 license requirements, Site Emergency Plan, Security Plan, and QA program requirements and related administrative controls. The ISFSI Manager will be required to have, at a minimum, a Bachelor's Degree in Engineering or Science or Equivalent, and 10 years power plant experience of which a minimum of 3 years shall be related nuclear power plant experience.

The Operations Manager, the Facility Maintenance Coordinator, the Technical Specialist, the Licensing Manager, the Radiation Protection Manager, and the Security Manager will report to the ISFSI Manager and will fulfill the functional responsibilities performed by existing licensee staff in comparable positions in the SAFSTOR organization. These positions will be responsible for supporting day to day operation of the ISFSI to ensure compliance with 10 CFR Part 50 Licenses and applicable laws and

regulations. The individual filling the Radiation Protection Manager position will be required to have the education, training, and experience to fulfill the requirements of ANSI/ANS-3.1-2014 (Section 4.3.3, Radiation Protection) middle level manager and radiation protection manager.

b. Experience and Expertise

The experience and expertise of NorthStar, Orano, and WCS are briefly described below:

NorthStar Group Services, Inc.

NorthStar is the largest demolition and asbestos abatement company in the world. As owner, program manager and the demolition and abatement contractor, NorthStar brings over 30 years of experience to the D&D effort, including successful completion of four research reactors at the Universities of Buffalo, Arizona, Illinois and Washington. NorthStar has been involved with decommissioning at Hanford and Savannah River, the deconstruction of nuclear reactor laboratory facilities at several universities, and has been awarded a contract to support the decommissioning of 10 reactor sites in the UK. In October 2018, the NRC issued an Order approving the transfer of the Vermont Yankee nuclear power plant operating license to NorthStar. The transfer included the plant's dry cask spent nuclear fuel storage facility. As part of the review in support of the transfer, NorthStar was confirmed to meet the regulatory, legal, technical, and financial requirements necessary to qualify them as an NRC licensee.

Orano USA LLC

Orano USA is the U.S. subsidiary of Orano SA, a global nuclear fuel cycle services provider. For more than 40 years, Orano SA has been involved in more than 160

decommissioning and dismantling projects, including 64 nuclear energy facilities at sites in Germany, the United States, United Kingdom, Japan and other countries.

Headquartered in Washington, D.C., Orano USA is a leading technology and services provider for decommissioning shutdown nuclear energy facilities, used fuel management, federal site cleanup and closure, and the sale of uranium, conversion, and enrichment services to the U.S. commercial and federal markets. With its parent company Orano SA, Orano USA has more than 30 years' experience in decontaminating and dismantling nuclear facilities, and more than 50 years' experience securely transporting and storing used nuclear fuel. Orano and its affiliates provide leading expertise in vessel and internals segmentation, with specific PWR experience including RPV/internals segmentation and packaging at the Yankee Rowe, Maine Yankee, and Connecticut Yankee nuclear power plants.

Waste Control Specialists, LLC

WCS is a leader in low-level radioactive waste management, packaging, transportation and disposal. WCS brings extensive Class A, B and C and Exempt Waste Disposal experience to the CR-3 decommissioning project. WCS will provide on-site waste processing, management, packaging and loading, as well as disposal in accordance with the Texas Compact. In addition to its CEO (Scott State), the WCS Senior Management team includes experienced personnel, such as President and Chief Operating Officer David Carlson, who has more than 25 years of experience leading the growth and operations of nuclear energy and environmental management companies, and Vice President and General Manager Jay Britten, who has over 20 years of experience in the radioactive waste management industry and has worked at numerous

DOE sites including the Pantex Plant, Rocky Flats Environmental Technology Site, Idaho Cleanup Project, and the Nevada Security Site.

The CR-3 decommissioning project organization will provide an experienced nuclear management team to assure compliance with the requirements of the Licenses and the Commission's regulations. ADP CR3 will implement a management approach to assure efficient and effective D&D planning, preparation, and execution; a safety conscious work environment; day-to-day industrial safety, radiological protection, radioactive waste handling and management rigor; effective corrective action program; performance reporting, monitoring, and metrics; personnel performance; and financial controls.

Corporate support functions, to include training, external affairs, legal services, accounting, finance, payroll, information technology, human resources and employee concerns will be obtained from ADP CR3's parent companies by means of services contracts.

DEF will transfer to ADP CR3 control over the assets related to CR-3 that will be needed in order to maintain the CR-3 Facility and the site in accordance with NRC requirements. These assets will include, in addition to the structures and equipment, the necessary books, records, safety and maintenance manuals and engineering construction documents.

c. Qualifications of Key Management Personnel

As described above, the VP/PM for the CR-3 project will be John Hager. The VP/PM will report to Scott E. State, P.E., Chief Executive Officer of NorthStar Group Services, Inc. and Chief Nuclear Officer of ADP CR3. The VP/PM will be the officer with

all the necessary authority and full responsibility for overall nuclear safety and the safe and reliable accomplishment of the decontamination and decommissioning activities of the CR-3 decommissioning project. Several technical support functions, including QA and Licensing, ES&H-RSO, D&D Operations, Remediation Management, Waste Management, Compliance Engineering and ISFSI/Plant Manager will report to the VP/PM. In addition, the ADP CR3 Executive Committee (EC) will provide oversight and advice on issues of project performance and safety. The Chairperson of the EC will be Scott E. State, P.E.

d. Conclusion

ADP CR3 will provide a management team that is experienced and qualified, and the organization is well-designed to accomplish the maintenance and decommissioning of the site. The necessary management processes and controls will be applied, with clear lines of authority and communication. In addition, ADP CR3 will rely upon the experience and expertise of NorthStar, Orano and WCS to perform key, specific, portions of work scope to ensure efficient and expeditious decommissioning of the CR-3 site. The ADP CR3 management team and the specific knowledge of its strategic partners will allow ADP CR3 to achieve synergies and management efficiencies at CR-3, as well as expedite the expected date of site release for unrestricted use. For these reasons, ADP CR3 and its management team will have the necessary technical qualifications to safely perform the activities described in this Application.

5. Financial Qualifications

a. DEF

Under 10 CFR 50.80(b)(1)(i), an application for a license transfer must contain all the requested information related to financial qualifications as required by 10 CFR 50.33. An "electric utility" as defined in 10 CFR 50.2 is exempted from the requirement to submit financial qualifications information under 10 CFR 50.33(f). An "electric utility" is "any entity that generates or distributes electricity and which recovers the cost of this electricity, either directly or indirectly, through rates established by the entity itself or by a separate regulatory authority." DEF recovers its cost of electricity through rates established by the Florida Public Service Commission, and it will continue to do so following the proposed license transfers, including the ability to seek further ratepayer funding for decommissioning. DEF is an "electric utility" as defined in 10 CFR 50.2. As such, it is presumed to be financially qualified, and it is exempt from the financial qualifications information requirements pursuant to 10 CFR 50.33(f) and in accordance with Section III.1.b of NUREG-1577, Rev. 1.

b. ADP CR3

Following the proposed transfer, DEF will maintain the existing NDT, and it will be responsible to direct the trustee to disburse funds to pay for the costs of decommissioning as work is progressed. Under the terms of the DSA, ADP CR3 is entitled to request funding by certifying the completion of various "pay-items" that reflect decommissioning work. If a dispute were to arise for regarding any given certification, the terms of the DSA include dispute resolution mechanisms designed to minimize disruption of funding, and ADP CR3 is protected against the potential for increased costs due to disagreements with

DEF. Based upon its access to trust funds pursuant to the terms of the DSA, ADP CR3 will be financially qualified to fund ADP CR3's possession, maintenance and decommissioning of the CR-3 site.

Because ADP CR3 will not be authorized under the Facility License to operate or load fuel in the reactor pursuant to the terms of 10 CFR 50.82(a)(2), ADP CR3 will not conduct any of the operations contemplated by the financial qualifications provisions of 10 CFR 50.33(f)(2), but rather all of its licensed activities will involve possession of radioactive material in connection with maintaining the safe condition of the plant, decommissioning the CR-3 site (including the ISFSI), and maintaining the ISFSI until it can be decommissioned. Thus, the existing decommissioning trust funds provide the appropriate basis for the financial qualifications of ADP CR3.

ADP CR3 has analyzed the remaining expected costs of decommissioning, including the expected annual cash flows, and it believes that with conservative NDT investments that are designed to assure the preservation of the fund to be available for prompt decommissioning, the required funding level in the accounts available to ADP CR-3 will be sufficient to pay all of the annual expected costs of decommissioning the CR-3 Facility. This is based on the estimate of the remaining expected costs of decommissioning. Further, the major decommissioning work will be performed under fixed price or fixed unit contracts, subject to performance bonds (or insurance, where appropriate) issued by qualified surety companies to guarantee the performance of the tasks, and with withdrawals from the NDT limited under a decommissioning pay-item approach, which reasonably assures completion of the work within the cost estimates. In

addition, under this approach, any cost overruns on one task do not affect the funds remaining in the NDT to pay for the completion of other tasks.

ADP has prepared Enclosure 4, *Schedule and Financial Information for Decommissioning,* which provides financial projections for the duration of the CR-3 decommissioning project and shows that the amount of the decommissioning trust funds in the CR-3 NDT being made available to ADP CR3 under the DSA will be adequate to fund the costs of decommissioning CR-3 and eventual costs of decommissioning the ISFSI. The right to draw on the source of funds described herein and the *pro forma* projected costs for the planned decommissioning period set forth in Enclosure 4 provide the requisite financial information for this license transfer request consistent with 10 CFR 50.33(f)(2).

As of April 30, 2019, the assets in the CR-3 NDT had a market value of approximately $731 million. Under the terms of the DSA, DEF will execute the Fourth Amendment to Amended and Restated Nuclear Decommissioning Trust Agreement, in which it will segregate $540 million into an "IOI Decommissioning Account" dedicated to funding ADP CR3's decommissioning activities necessary to achieve the ISFSI-Only Interim End State Conditions, as defined in the DSA (partial license termination). All remaining assets in the CR-3 NDT will be held in a "Crystal River Reserve Account" within the trust and will remain dedicated to assuring the decommissioning of CR-3. This account will likely exceed $100 million. The cash flow analysis in Enclosure 4 shows that the $540 million dedicated for ADP CR3 is sufficient to fund the entire estimated cost of decommissioning CR-3.

Thus, the availability of funds in the CR-3 NDT satisfies the "prepayment" method of providing decommissioning funding assurance pursuant to 10 CFR 50.75(e)(1)(i), and satisfies the "prepayment" method of providing ISFSI decommissioning funding assurance pursuant to 10 CFR 72.30.

ADP CR3's projected costs are based upon a detailed, site specific cost estimate that provides costs for each projected work activity. These estimates provide a conservative and very realistic estimate of expected costs that ADP CR3 believes is very reliable and should be viewed as bounding the potential costs. For example, the estimate assumes that the waste from all contaminated structures will be disposed in a low-level radioactive waste disposal facility (Class A, B or C). This is a conservative assumption, because ADP CR3 believes significant volumes of waste can be cleared for "free release" and/or disposed as low activity waste that does not require disposal in a licensed Class A low-level radioactive waste disposal facility. In preparing these estimates, ADP CR3 has considered the records required by 10 CFR 50.75(g), groundwater monitoring data including the information described in the PSDAR, the results of a 2014 Historic Site Assessment (HSA) study, and other information characterizing the site, all of which supports the ability to complete decommissioning of the site for unrestricted release within the cost estimates and schedule.

Moreover, ADP CR3's breakdown of work and cost estimates rely upon costs generated by either affiliates of ADP CR3 or ADP CR3's partners that will be specified ultimately in fixed price or fixed rate contracts that will be entered into and bonded. These contractors, including any affiliate, will be required to post performance bonds (or insurance, where appropriate) issued by qualified surety companies to guarantee the

performance of the tasks that assure the work is performed at the specified costs. Moreover, ADP CR3's contract terms, whether with an affiliate, partner or other, will specify a "pay-item approach" with milestones that require work progress and actual performance before funds will be withdrawn from the trust fund to pay for the work. Under this pay-item approach, the trust funds will be adequate to cover costs, because ADP CR3 and its contractors performing work have agreed upon the pay-items. This includes work performed by NorthStar or Orano, whether by ADP CR3 or an affiliate, as well as work performed by the various others, such as WCS.

In addition to the trust funds, ADP CR3 will have access to other financial assurance provided by its parent companies, NorthStar and Orano. NorthStar will enter into a financial Support Agreement in the amount of $105 million, and Orano will enter into a financial Support Agreement in the amount of $35 million. These agreements provide that $140 million will be available if needed for ADP CR3 to meet any of its obligations so that CR-3 is maintained and decommissioned in compliance with the requirements of the NRC. The forms of these agreements are provided as Enclosure 6 to this Application. NorthStar has annual revenues of more than $600 million and bonding capacity of $350 million. It has completed more than $5 billion in projects since 1986.

As detailed above, Orano is owned by Orano USA, the U.S. subsidiary of Orano SA, a global nuclear fuel cycle company. Orano SA had revenues of €3.623 billion for the year-ended December 31, 2018, with €611 million reported for North and South America. Orano SA has a total issued bonding capacity of €426 million, secured by credit facilities with financial institutions. Orano benefits from this bonding capacity.

Finally, ADP CR3 has agreed to establish a Provisional Trust, which will be initially funded with $20 million. ADP CR3 has also agreed that it will retain 6% of each invoice for decommissioning services performed and paid from the DEF NDT and deposit such amounts into the Provisional Trust. This retainage will continue until the Provisional Trust contains $50 million. This provides additional financial assurance of the performance of ADP CR3, and these amounts will not be fully released to ADP CR3 until the NRC approves partial license termination for an ISFSI-Only site.

c. ADP SF1

ADP SF1 will own the ISFSI and its associated equipment, and it will hold title to the CR-3 spent nuclear fuel, the high-level waste, and the greater than Class C waste at the CR-3 Facility, as well as the associated canisters. ADP SF1 will own, but not possess, the spent fuel and waste pursuant to the general license provided in 10 CFR 72.6(b). Applicants recognize that a co-owner of an operating reactor would be named as a specific licensee. However, the CR-3 Facility is no longer a production or utilization facility, and ADP SF1's ownership interests are limited to the generally licensed ISFSI, and the generally licensed spent fuel and waste, which will be possessed and maintained by ADP CR3. Therefore, ADP SF1 will not be named as a specific licensee in the Part 50 license for the CR-3 Facility.

ADP SF1 will enter into a Services Agreement with ADP CR3, to pay the costs incurred by ADP CR3 in maintaining and removing the spent nuclear fuel, the high-level waste, the greater than Class C waste, and the associated canisters from the site. Thus, ADP CR3 will satisfy the requirement in 10 CFR 50.54(bb) for a plan for funding spent fuel management based upon its entitlement to funding under the Services Agreement

with ADP SF1. This Services Agreement also provides the foundation for financial assurance for decommissioning of the ISFSI being provided under the terms of a contract, as contemplated by 10 CFR 50.75(e)(1)(v).

ADP SF1 estimates that the current cost of decommissioning the ISFSI is $3.7 million, and ADP SF1 will establish a nuclear decommissioning trust fund for purposes of holding funds to decommission the ISFSI. At the time of the license transfer, ADP SF1 will provide financial assurance for ISFSI decommissioning using one of the methods set forth in 10 CFR 72.30(e). ADP SF1 may propose to deposit $3.95 million in the trust, which at the allowed 2% real rate of return would be projected to grow to $5.4 million by 2037, when the ISFSI is expected to be decommissioned.

ADP SF1 will be assigned the DOE Standard Contract, including all rights and obligations under that contract. ADP SF1's payments to ADP CR3 under the Services Agreement to operate, maintain and decommission the ISFSI, and to ultimately remove spent fuel from the ISFSI, will be substantially recoverable from DOE either through litigation of ADP SF1's claims under the Standard Contract or through the settlement of ADP SF1's future claims under that contract. ADP SF1 expects that its parent companies will provide funding in order to fund activities until it obtains a settlement and, thereafter, to fund ongoing costs in advance of recovering damages and for any disallowed damages claims.

ADP SF1 is a beneficiary of the $140 million in Support Agreements provided by NorthStar and Orano, and therefore, its parent companies will provide the funds necessary to pay ADP CR3 in advance of ADP SF1 recovering those costs from DOE through litigation or under a settlement, and/or to pay for ADP CR3's costs that are not

recoverable from DOE through either litigation or settlement. If ADP SF1 is unable to obtain a settlement agreement from the DOE by January 1, 2025, it will post a performance bond in an amount equal to one year's worth of spent fuel management expense. It will thereafter maintain a performance bond for subsequent years, in the amount of the applicable estimated annual expense, until a settlement is obtained from DOE.

6. Restricted Data

This Application does not contain any Restricted Data or other classified National Security Information, and it is not expected that any such information will become involved in the licensed activities of ADP CR3. However, in the event that such information does become involved, and in accordance with Section 145(a) of the AEA and 10 CFR 50.37, "Agreement Limiting Access to Classified Information," ADP CR3 agrees that it will appropriately safeguard such information and will not permit any individual to have access to such information until the individual has been appropriately approved for such access under the provisions of 10 CFR Part 25, "Access Authorization," and/or Part 95, "Facility Security Clearance and Safeguarding of National Security Information and Restricted Data."

7. Other Nuclear Regulatory Issues

a. Price-Anderson Indemnity and Nuclear Insurance

ADP CR3 requests that the NRC amend the Price-Anderson indemnity agreement for CR-3 to add "ADP CR3, LLC" upon the consummation of the proposed transfers of the Licenses. DEF will continue to maintain offsite nuclear liability coverage and onsite property damage insurance coverage, in accordance with the exemptions that have been

granted for the CR-3 site with respect to the requirements of 10 CFR 50.54(w) and 10 CFR 140.11. The annual filings required by 10 CFR 50.54(w)(3) and 10 CFR 140.21 will continue to be made by DEF or on its behalf by ADP CR3.

A Federal Register Notice dated March 31, 2016 regarding the 10 CFR 50.54(w) exemption is available at ADAMS Accession No. ML16084A891. Under that exemption, the required amount of onsite property damage insurance for CR-3 has been reduced to $50 million. The 10 CFR 140.11 exemption was granted by letter dated April 27, 2015 (ADAMS Accession Nos. ML14183B338 & ML14183B477). DEF is also exempt from participation in the secondary insurance pool, and the required amount of third party liability insurance has been reduced to $100 million.

b. Standard Contract for Disposal of Spent Nuclear Fuel

Upon closing, ADP SF1 will hold title to the spent nuclear fuel at CR-3, as well as high-level waste, and greater than Class C waste. DEF will also assign the DOE Standard Contract, including all rights and obligations under that contract, to ADP SF1, and will provide notice to DOE of such assignment. This Standard Contract, No. DE-CR01-83NE44382, dated June 30, 1983, was entered into by the predecessor to DEF, Florida Power Corporation, and the United States of America, represented by the DOE, to govern the disposal of spent nuclear fuel generated at CR-3.

c. Exclusion Area Control

Upon approval of the transfer, ADP CR3 will have the authority to control the CR-3 exclusion area and to determine all activities within the exclusion area to the extent required by 10 CFR Part 100. ADP CR3 will provide operations, maintenance, access control, and security services for the ISFSI, subject to the requirements of the Licenses

and the access control programs implemented thereunder. ADP CR3 will have the rights to control the site as necessary to comply with the requirements of the Licenses, including the ability of ADP CR3 to exclude personnel and property from the Exclusion Area to the extent required by 10 CFR Part 100.

d. Post Shutdown Decommissioning Activities Report

ADP CR3 will submit an updated PSDAR that will reflect its plans for an accelerated decommissioning schedule. This updated PSDAR will be submitted and can be reviewed by the NRC staff in parallel with this Application. In accordance with 10 CFR 50.82(a)(4)(i), the updated PSDAR will present a description of the planned decommissioning activities to be undertaken by ADP CR3, along with a schedule for their accomplishment and an estimate of expected costs, consistent with the projections provided in Enclosure 4.

e. QA Program

Upon consummation of the transfer, ADP CR3 will assume authority and responsibility for the functions necessary to fulfill the quality assurance (QA) requirements of the Defueled Technical Specifications and as specified for CR-3 in the CR-3 Quality Assurance Program contained in the Defueled Safety Analysis Report (DSAR). ADP CR3 will assume all of the current functions of the existing QA organization, although ADP CR3 may contract with qualified vendors for certain QA oversight and inspection functions. ADP CR3 does not anticipate any changes to the existing QA program for CR-3 beyond conforming changes consistent with the license transfer, but any changes that do occur will be made in accordance with 10 CFR 50.54(a).

f. Continuation of the Current Licensing Basis

ADP CR3 will possess or have access to all books and records necessary for compliance with its obligations under the Licenses and NRC requirements. ADP CR3 will assume responsibility for compliance with the current licensing basis, including regulatory commitments that exist at closing, and will implement any changes under applicable regulatory requirements and practices.

8. Requested Review Schedule and Other Required Approvals

The Applicants respectfully request that the NRC review and complete action expeditiously on the enclosed Application. The Applicants are prepared to work closely with the NRC Staff to facilitate the review of the Application. The Applicants request that the NRC issue an Order by December 31, 2019 authorizing the transfers to take place at any time through December 31, 2020. Applicants also request that the license changes be made effective as of the transaction closing date.

The proposed license transfers are subject to other required regulatory approvals, including the approval of the Florida Public Service Commission. The Applicants will advise the NRC if there are any significant changes in the status of other required approvals or developments that could have an impact on the closing date.

9. Regulatory Safety Analysis

The changes proposed for the Facility License are shown in Attachment 2 to the transmittal letter, and clean pages are provided as Attachment 3 to the transmittal letter. The changes conform the license to reflect the proposed transfer of authority and responsibility for licensed activities under the Facility License to ADP CR3. Consistent with the generic determination in 10 CFR 2.1315, "Generic determination regarding

license amendments to reflect transfers," paragraph (a), the proposed conforming license amendment involves no significant hazards consideration, because it does no more than conform the license to reflect the transfer actions.

The proposed license amendment does not involve any change in the design or licensing basis, plant configuration, the status of CR-3, or the requirements of the facility license. Therefore, approval of the license amendment does not: (1) involve an increase in the probability or consequences of an accident previously analyzed; (2) create the possibility of a new or different kind of accident from the accidents previously evaluated; or (3) involve a significant reduction in a margin of safety.

10. Environmental Considerations

This Application and accompanying administrative amendments are exempt from environmental review, because they fall within the categorical exclusion appearing at 10 CFR 51.22(c)(21), "Approvals of direct or indirect transfers of any license issued by NRC and any associated amendments required to reflect the approval of a direct or indirect transfer of an NRC license," for which neither an Environmental Assessment nor an Environmental Impact Statement is required.

11. Summary

In summary, the proposed license transfers will be consistent with the requirements of the Atomic Energy Act, NRC regulations, and regulatory guidance. Upon consummation of the proposed transaction, ADP CR3 will proceed expeditiously to complete the decommissioning of CR-3, so there will be no adverse impact on public health and safety. The transfers of the Licenses will not be inimical to the common defense and security and does not involve foreign ownership, control or domination. Applicants therefore request that the NRC consent to the transfers in accordance with 10 CFR 50.80 and 72.50, and approve the conforming administrative amendment pursuant to 10 CFR 50.92.

ENCLOSURE 1
(Non-Proprietary Version)

DECOMMISSIONING SERVICES AGREEMENT

Execution Copy

DECOMMISSIONING SERVICES AGREEMENT

BY AND BETWEEN

DUKE ENERGY FLORIDA, LLC, as COMPANY

AND

ADP CR3, LLC, as CONTRACTOR

AND

ADP SF1, LLC, as BUYER

Dated as of May 29, 2019

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Exhibit C	Form of SNF Services Agreement
Exhibit D	Form of Amended and Restated LLC Agreement
Exhibit E	Form of Pledge Agreement
Exhibit F	Fourth Amendment to Amended and Restated NDF Agreement
Exhibit G	Form of Contractor's Provisional Trust Agreement
Exhibit H-1	Form of Parent Support Agreement (NorthStar)
Exhibit H-2	Form of Parent Support Agreement (Orano)
Exhibit I	[redacted]
Exhibit J	Form of Assignment and Assumption Agreement
Exhibit K	Form of Bill of Sale
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Exhibit M	Form of ISFSI Decommissioning Trust Agreement

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Schedule 2.2.9	Environmental Matters

DECOMMISSIONING SERVICES AGREEMENT

THIS DECOMMISSIONING SERVICE AGREEMENT dated as of May 29, 2019 (the "Contract Date"), is entered into by and among DUKE ENERGY FLORIDA, LLC, a Florida limited liability company ("Company"), ADP CR3, LLC, a Delaware limited liability company ("Contractor"), and ADP SF1, LLC, a Delaware limited liability company ("Buyer"). Company, Contractor and Buyer are referred to individually herein from time to time as a "Party," and collectively as the "Parties".

RECITALS

WHEREAS, Company owns a one hundred percent (100%) undivided interest in the Crystal River 3 nuclear power station located in Citrus County, Florida, including the spent nuclear fuel stored in the independent spent fuel storage installation on the Crystal River Energy Complex site.

WHEREAS, the Crystal River 3 nuclear power station has been permanently shut down and is currently in SAFSTOR.

WHEREAS, Company desires to (a) engage Contractor to perform the activities necessary to decommission the CR-3 Facility and the NRC-Licensed Site, including permitting activities, demolishing, decontaminating and dismantling existing structures and facilities, and waste disposal, as further described herein, and to achieve ISFSI-Only Interim End-State Conditions and End-State Conditions (each as defined below), upon the terms and conditions set forth in this Agreement; and (b) sell and assign to Buyer the Spent Nuclear Fuel, storage canisters, HLW, including Greater Than Class C waste from the CR-3 Facility as currently stored on the ISFSI, or otherwise located at the CR-Facility and to be stored on the ISFSI, and the ISFSI and certain related assets, together with certain associated liabilities and obligations, and Buyer desires to assume such liabilities and obligations and purchase such spent nuclear fuel, HLW and the ISFSI and related assets, upon the terms and conditions as set forth in the Spent Nuclear Fuel Purchase and Sale Agreement attached hereto as Exhibit A (the "SNF PSA"). Capitalized terms used and not defined in these recitals are defined below.

WHEREAS, Company is requiring that Contractor provide guarantees in the form attached hereto as Exhibit B from the Parent Guarantors (as defined herein) as a condition to Company's willingness to enter into and perform its obligations under this Agreement and the Ancillary Agreements (as defined below).

WHEREAS, Contractor and its Affiliates, including the Parent Guarantors, are experienced and qualified in providing technical assistance, design, licensing, engineering, procurement, supply, construction management, construction, decommissioning services, and nuclear waste packaging, storage transportation and disposal services, and possesses the requisite expertise and resources to achieve the ISFSI-Only Interim End-State Conditions and the End-State Conditions.

WHEREAS, pursuant to and in accordance with the SNF PSA, Company will transfer title for the Spent Nuclear Fuel, HLW and all rights and obligations under the Spent Fuel Disposal Contract, together with the other Assets as defined therein, to Buyer.

WHEREAS, Contractor desires to perform the Decommissioning for a fixed price, and Company has agreed to pay Contractor the fixed price for the Decommissioning from the qualified trust fund maintained within the NDF, on the terms and conditions as set forth herein.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual promises and covenants herein contained, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and intending to be legally bound hereby, Company and Contractor agree as follows:

ARTICLE 1
DEFINITIONS; INTERPRETATION; EFFECTIVENESS

1.1 Definitions.

1.1.1 As used in this Agreement, the following terms have the meanings specified in this Section 1.1.1.

"Affiliate" means, with respect to a specified Person, a Person that, directly or indirectly, through one or more intermediaries, now or hereafter, owns or controls, is owned or controlled by, or is under common ownership or control with a Party, where "control" (including the terms "controlled by" and "under common control with") means (i) at least a fifty percent (50%) ownership interest, or (ii) the possession, directly or indirectly, of the power to direct or cause the direction of the management or policies of a Person, whether through the ownership of stock or other securities, as trustee or executor, by contract or credit arrangement or otherwise.

"Agreed Amount" means, as of the Closing Date, an amount of cash in the IOI Decommissioning Subaccount that is equal to Five Hundred Forty Million Dollars ($540,000,000) [redacted]

"Agreed Outage Period" has the meaning set forth in Section 8.6.4.

"Agreement" means this Decommissioning Services Agreement, and all of the Attachments and Exhibits attached hereto, each of which is incorporated herein in its entirety by the reference, as the same may be amended, supplemented or modified from time to time in accordance with the terms hereof.

"Amended and Restated LLC Agreement" means the amended and restated limited liability company agreement governing Contractor in accordance with the Laws of the State of Delaware, in the form attached hereto as Exhibit D.

"Amended and Restated NDF Agreement" means the Amended and Restated Nuclear Decommissioning Trust Agreement dated May 1, 2008 by and between the Trustee and Company, as amended as of November 13, 2013, January 29, 2014 and December 31, 2015, and following the Closing, as amended by the Fourth Amendment to Amended and Restated NDF Agreement.

"Ancillary Agreements" means the SNF PSA, the Parent Guaranties, the Pledge Agreement, the Parent Support Agreements, the Fourth Amendment to Amended and Restated NDF Agreement, the Contractor's Provisional Trust Agreement, [redacted] the ISFSI Decommissioning Trust Agreement, the Amended and Restated LLC Agreement, the Assignment and Assumption Agreement, the SNF Services Agreement, and the Bill of Sale.

"ANI" means American Nuclear Insurers, or any successors thereto.

"Assignment and Assumption Agreement" means the Assignment and Assumption Agreement between Company and Buyer in the form attached hereto as Exhibit J, whereby at the Closing, Company (as Seller under the SNF PSA) shall assign and Buyer shall assume the Assets and the Assumed Liabilities, as applicable.

"Atomic Energy Act" means the Atomic Energy Act of 1954, as amended (42 U.S.C. Section 2011 et seq.).

"Bankruptcy Code" means Title 11 of the United States Code, as amended from time to time, or any similar federal or state Law for the relief of debtors.

"Bankruptcy Event" means, with respect to any Person, that any one or more of the following has occurred:

(a) that Person has commenced a voluntary case concerning itself under the Bankruptcy Code;

(b) an involuntary case is commenced against that Person under the Bankruptcy Code and the petition is not controverted within thirty (30) days, or is not dismissed within ninety (90) days after commencement of the case;

(c) a custodian (as defined in the Bankruptcy Code) is appointed for, or takes charge of, all or any substantial part of the property of that Person;

(d) that Person commences any other proceedings under any reorganization, arrangement, adjustment of debt, relief of debtors, dissolution, insolvency or liquidation or similar Law of any jurisdiction whether now or hereafter in effect relating to that Person;

(e) there is commenced against such Person any proceeding of the type described in clause (d) above and such proceeding is not controverted within thirty (30) days or is not dismissed for a period of ninety (90) days;

(f) any order of relief or other order is entered approving any case or proceeding of the types described in clauses (b) or (d) above;

(g) that Person makes a general assignment for the benefit of creditors; or

(h) that Person admits in writing its general inability to pay its debts when due or shall, by any act consents to, approves or acquiesces in any of the foregoing.

"Bill of Sale" means the Bill of Sale, in the form attached hereto as Exhibit K, whereby at the Closing, Company (as Seller under the SNF PSA) shall transfer and Buyer shall acquire certain of the Assets, as applicable.

"Business Books and Records" means all books, operating records, licensing records, quality assurance records, purchasing records, and equipment repair, maintenance or service records of Company relating to the design, construction, licensing, operation or Decommissioning of the CR-3 Facility, including operating, safety and maintenance manuals, inspection reports, Environmental assessments, engineering design plans, Company's costs estimates with respect to Decommissioning under its Decommissioning Plan, blueprints and as built plans, specifications, operating procedures and other similar items of Company, wherever located, including those records related to CR-3-related structures, or operations or activities anywhere on the NRC-Licensed Site, whether existing in hard copy or magnetic or electronic form; provided, however, that Business Books and Records do not include the records of Company primarily relating to the design, construction, licensing, or operation of Excluded Facilities. After the Closing, Business Books and Records shall include all books, operating records, licensing records, quality assurance records and other records relating to the Decommissioning of the CR-3 Facility and the NRC-Licensed Site that Contractor is required to maintain under applicable Laws, including Nuclear Laws.

"Business Day" any day other than Saturdays; Sundays; New Year's Day; Birthday of Dr. Martin Luther King, Jr.; Memorial Day; Independence Day; Labor Day; Veterans' Day; Thanksgiving Day; Friday after Thanksgiving and Christmas Day.

"Buyer" has the meaning set forth in the preamble.

"Byproduct Material" means any radioactive material (except Special Nuclear Material) yielded in, or made radioactive by, exposure to the radiation incident to the process of producing or utilizing Special Nuclear Material.

"Change in End-State Conditions" means a material deviation by the Florida Department of Environmental Protection from the positions regarding the end state conditions reflected in the FDEP Letter.

"Change in Law" means a change in any applicable Law, including a change in (a) release criteria for the NRC-Licensed Site under Environmental Laws or Nuclear Laws; and (b) regulations that implement such Environmental Laws or Nuclear Laws, that adversely impacts Contractor's costs to obtain termination or partial termination of the NRC License and unrestricted release of all or part of the NRC-Licensed Site, as applicable, but not including a Change in End-State Conditions.

"Closing" has the meaning set forth in Section 4.1.

"Closing Date" has the meaning set forth in Section 4.1.

"Code" means the Internal Revenue Code of 1986, as amended, and the rules and regulations promulgated thereunder.

"Company" has the meaning set forth in the preamble.

"Company Indemnified Parties" means Company, its Affiliates and the respective officers, directors, employees and agents of Company and its Affiliates; provided that none of Contractor or any of its Affiliates or their respective officers, directors, employees or agents shall be a Company Indemnified Party.

"Company Permit" means each Environmental Permit to be obtained or maintained by Company as described in Attachment 14-A, and each other Permit that Company agrees to obtain and maintain under this Agreement in accordance with Section 8.2.5.

"Company Proprietary Information" means, (a) the following furnished by or on behalf of Company, its Affiliates or their respective Representatives to Contractor, its Affiliates or their respective Representatives, in each case whether furnished under this Agreement, the SNF PSA, the Pre-Closing Decommissioning Services Contract or any Ancillary Agreement, or before or after the Contract Date or the Closing Date: (i) all drawings, reports, data, software, materials or other information relating to the operation and maintenance or Decommissioning, actual or proposed, of the CR-3 Facility, the NRC-Licensed Site or the Crystal River Site; (ii) any financial, operational or other information concerning Company or any of its Affiliates or their respective assets and properties, including geologic, geophysical, scientific or other technical information, and know-how, inventions and trade secrets; (iii) any Third Party Proprietary Information; or (iv) any other information, whether oral or written or in electronic or digital media, and regardless of the manner in which it is furnished, that is provided by or on behalf of Company, its Affiliates or their respective Representatives to Contractor, its Affiliates or their respective Representatives, including any such information that may be included or reflected in reports, analysis or other documents prepared by or on behalf of Contractor, its Affiliates or their respective Representatives; and (b) any deliverables, submittals or information (other than with respect to the financial condition of Contractor or the Parent Guarantors or with respect to the Spent Nuclear Fuel and other Assets acquired by Buyer pursuant to the SNF PSA) prepared and furnished by Contractor hereunder or in connection with the SNF PSA, and the Business Books and Records to be maintained by Contractor hereunder with respect to the CR-3 Facility, the NRC-Licensed Site and the Decommissioning; provided that Company Proprietary Information does not include any such information which (i) is or becomes generally available to the public other than as a result of a disclosure by Contractor, its Affiliates or their respective Representatives; (ii) was available to Contractor, its Affiliates or their respective Representatives on a non-confidential basis prior to its disclosure by or on behalf of Company or its Affiliates; (iii) becomes available to Contractor, its Affiliates or their respective Representatives on a non-confidential basis from a Person other than Company, its Affiliates or their respective Representatives who is not otherwise bound by a confidentiality agreement with Company or any of its Affiliates, or is otherwise not under any obligation to Company or any of its Affiliates not to transmit the information to Contractor, its Affiliates or their respective Representatives; or (iv) was independently developed by Contractor, its Affiliates or their respective Representatives without reference to or reliance upon Company Proprietary Information.

"Company's EH&S Requirements" means the environmental, health and safety procedures and requirements set forth in Attachment 8.

"Company's Non-Exclusive Access Right" has the meaning set forth in Section 8.6.3.

"Company's Required Regulatory Approvals" means the regulatory approvals required by Company as a condition to the Closing, as identified in Attachment 17.

"Condemned" has the meaning set forth in Section 8.5.1.

"Contract Date" has the meaning set forth in the preamble.

"Contractor" has the meaning set forth in the preamble.

"Contractor Event of Default" has the meaning set forth in Section 15.1.

"Contractor Indemnified Parties" means Contractor, its Affiliates and the respective officers, directors, employees and agents of Contractor and its Affiliates.

"Contractor Lien" has the meaning set forth in Section 6.9.

"Contractor Permit" means each Environmental Permit that is identified on Attachment 14-A as a Permit that will be transferred to or be obtained by Contractor, and each other Permit that Contractor is required to obtain and maintain under this Agreement.

"Contractor Proprietary Information" means information provided by or on behalf of Contractor, its Affiliates or their respective Representatives to Company, its Affiliates or their respective Representatives relating to Contractor's plans for the possession and maintenance of the Assets and the Decommissioning of the CR-3 Facility and the NRC-Licensed Site, and any financial, operational or other information concerning Contractor or any of its Affiliates or their respective assets and properties, and any deliverables, submittals or information with respect to the Spent Nuclear Fuel, and other Assets acquired by Buyer pursuant to the SNF PSA prepared and furnished by Contractor hereunder or in connection with the SNF PSA, whether oral or written, and regardless of the manner in which it is furnished; provided that Contractor Proprietary Information does not include any such information which (a) is or becomes generally available to the public other than as a result of a disclosure by Company, its Affiliates or their respective Representatives; (b) was available to Company, its Affiliates or their respective Representatives on a non-confidential basis prior to its disclosure by Contractor, its Affiliates or their respective Representatives; (c) becomes available to Company, its Affiliates or their respective Representatives on a non-confidential basis from a Person other than Contractor, its Affiliates or their respective Representatives that is not, to Company's Knowledge, otherwise bound by a confidentiality agreement with Contractor or any of its Affiliates, or is otherwise not under any obligation to Contractor or any of its Affiliates not to transmit the information to Company, its Affiliates or their respective Representatives; or (d) was independently developed by Company, its Affiliates or their respective Representatives without reference to or reliance upon Contractor Proprietary Information; provided, further, that any deliverables, submittals or information prepared and furnished by Contractor hereunder (other than with respect to the financial condition of Contractor or the Parent Guarantors or with respect to the Spent Nuclear

Fuel and the other Assets acquired by Buyer pursuant to the SNF PSA, which, for the avoidance of doubt, shall be considered only Contractor Proprietary Information), and the Business Books and Records to be maintained by Contractor hereunder with respect to the CR-3 Facility, the NRC-Licensed Site and the Decommissioning, shall be treated as both Contractor Proprietary Information and Company Proprietary Information for the purposes of this Agreement.

"Contractor's Non-Exclusive Access Right" has the meaning set forth in Section 8.6.2.

"Contractor's Provisional Trust Agreement" means the trust agreement, substantially in the form set forth in Exhibit G, by and between Contractor and a qualified trustee governing Contractor's Provisional Trust Fund.

"Contractor's Provisional Trust Fund" has the meaning set forth in Section 3.14.

"Contractor's Required Regulatory Approvals" means the regulatory approvals required by Contractor as a condition to the Closing, as identified in Attachment 17.

"CR-3 Facility" means the pressurized reactor power plant and all of the ancillary facilities, equipment, supplies, structures and buildings, including the ISFSI and underground structures, that form the Crystal River nuclear power plant, commonly known as Crystal River Unit 3, located on the Gulf of Mexico in Citrus County, Florida, and including the real property underlying the ISFSI Site and the other portions of the Crystal River Site on which the CR-3 Facility is located, but in any event not including the Excluded Facilities. The CR-3 Facility is depicted by the green areas set forth on page 27 of Attachment 1.

"CREC Committee" means Company's Crystal River Energy Complex management committee.

"Crystal River Decommissioning Reserve Subaccount" means a segregated subaccount within the NDF created and maintained solely for the purposes of holding the assets, funds and investments that are not otherwise held in the IOI Decommissioning Subaccount.

"Crystal River Site" means the area commonly known as the "Crystal River Energy Complex" that contains the CR-3 Facility, the NRC-Licensed Site, the ISFSI, and the Excluded Facilities, as further described and occupying the area as depicted in Attachment 1.

"Decommission" and "Decommissioning" means (a) the dismantlement and removal of the structures, and any reduction or removal of radioactivity, at the CR-3 Facility and the NRC-Licensed Site to a level that permits the release of all or any specified portion of the NRC-Licensed Site consistent with the radiological criteria for license termination specified by the NRC in 10 C.F.R. § 20.1402 for unrestricted use; (b) all other activities necessary for the retirement, dismantlement, decontamination or storage of the CR-3 Facility and NRC-Licensed Site in compliance with all applicable Nuclear Laws and Environmental Laws, including the applicable requirements of the Atomic Energy Act and the NRC's rules, regulations, orders and pronouncements thereunder; (c) operation and maintenance of the ISFSI, management of Spent Nuclear Fuel, the packaging of the Greater Than Class C Waste generated during the Decommissioning of the CR-3 Facility, and the removal of all of the Spent Nuclear Fuel and HLW from the ISFSI and the Crystal River Site; (d) restoration of the NRC-Licensed Site in

accordance with applicable Laws; and (e) any planning and administration activities incidental thereto.

"Decommissioning Costs" means the costs and expenditures incurred for goods and services (including any planning and administrative activities incidental thereto) provided in connection with the Decommissioning of the CR-3 Facility and the NRC-Licensed Site, but excluding costs incurred for the operation and maintenance of the ISFSI, management of Spent Nuclear Fuel, and the removal of all of the Spent Nuclear Fuel and HLW from the ISFSI and the Crystal River Site, and Decommissioning of the ISFSI.

"Decommissioning Plan" means the activities contemplated by the Post Shutdown Decommissioning Activities Report submitted by Company to the NRC on December 2, 2013.

"Department of Energy" or "DOE" means the United States Department of Energy and any successor agency thereto.

"Department of Energy Decommissioning and Decontamination Fees" means all fees related to the Department of Energy's Special Assessment of utilities for the Uranium Enrichment Decontamination and Decommissioning Funds pursuant to Sections 1801, 1802 and 1803 of the Atomic Energy Act and the Department of Energy's implementing regulations at 10 C.F.R. Part 766, as those statutes and regulations exist at the time of execution of this Agreement, applicable to separative work units purchased from the Department of Energy in order to decontaminate and decommission the Department of Energy's gaseous diffusion enrichment facilities.

[redacted]

"Dispute" has the meaning set forth in Section 16.7.1.

"Dispute Engagement Notice" has the meaning set forth in Section 16.7.1(a).

"Diverse Suppliers" has the meaning set forth in Section 6.11.

"End-State Conditions" means all of the following conditions, collectively, and "achieving" or "satisfying" the End-State Conditions, or terms of similar import, means the satisfaction of all of the following conditions:

(a) Contractor has satisfied all of the ISFSI-Only Interim End-State Conditions;

(b) Contractor has fully performed all of its obligations under the License Termination Plan as approved by the NRC, including removal of Spent Nuclear Fuel from the NRC-Licensed Site and the Decommissioning of the ISFSI;

(c) Contractor has completed the Remediation of all Hazardous Substances present in, on or under the CR-3 Facility sufficient to comply with Environmental Laws and all applicable Permits;

(d) without limiting Contractor's obligation to satisfy the criteria to complete the Decommissioning of the ISFSI, all buildings and structures constituting the ISFSI, including foundations, have been removed to a minimum of three feet (3') below grade and backfilled, graded and seeded to prevent erosion, and any underground storage tanks and large diameter pipes that are part of or located on or under the ISFSI and not otherwise required by Law or this Agreement to be removed, have been filled in compliance with all applicable Permits;

(e) Contractor has completed all of the work necessary to comply with the conditions set forth in the FDEP Letter and any Change in End-State Conditions, as applicable; and

(f) the NRC has approved the termination of the NRC License and released the ISFSI Site from NRC jurisdiction for unrestricted use pursuant to 10 C.F.R. § 20.1402.

"Environment" means all soil, real property, air, water (including surface waters, streams, ponds, drainage basins and wetlands), groundwater, water body sediments, drinking water supply, stream sediments or land, including land surface or subsurface strata, including all fish, plant, wildlife, and other biota and any other environmental medium or natural resource.

"Environmental Claim" means any and all written communications, administrative or judicial actions, suits, orders, liens, complaints, notices, including notices of violations of Environmental Laws, requests for information relating to the Release or threatened Release into the Environment of Hazardous Substances, proceedings, or other written communication, pursuant to or relating to any applicable Environmental Law by any Governmental Authority based upon, alleging, asserting, or claiming any actual or potential, and whether civil, criminal or administrative: (i) violation of, or Liability under any Environmental Laws; (ii) violation of any Environmental Permit; or (iii) Liability for investigatory costs, cleanup costs, removal costs, remedial costs, response costs, monitoring costs, natural resource damages, property damage, personal injury, fines, or penalties arising out of, based on, resulting from, or related to the presence, Release, or threatened Release into the Environment of any Hazardous Substances.

"Environmental Clean-up Site" means any location which is listed or formally proposed for listing on the National Priorities List, the Comprehensive Environmental Response, Compensation and Liability Information System, or on any similar state list of sites requiring investigation or cleanup.

"Environmental Laws" means all Laws, other than Nuclear Laws, relating to pollution, the protection, restoration or remediation of or prevention of harm to the Environment or natural resources, or the protection of human health and safety from the presence of Hazardous Substances, including Laws relating to Releases of Hazardous Substances (including Releases to the Environment) or otherwise relating to the manufacture, processing, distribution, use,

treatment, storage, Release, transport, disposal or handling of Hazardous Substances, and Laws regarding the treatment, storage, handling, transportation, and disposal of solid waste. "Environmental Laws" include the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. §§ 9601 et seq.), the Hazardous Materials Transportation Act (49 U.S.C. §§ 1801 et seq.), the Resource Conservation and Recovery Act (42 U.S.C. §§ 6901 et seq.), the Federal Water Pollution Control Act (33 U.S.C. §§ 1251 et seq.), the Clean Air Act (42 U.S.C. §§ 7401 et seq.), the Toxic Substances Control Act (15 U.S.C. §§ 2601 et seq.), the Oil Pollution Act (33 U.S.C. §§ 2701 et seq.), the Emergency Planning and Community Right-to-Know Act (42 U.S.C. §§ 11001 et seq.), the Occupational Safety and Health Act (29 U.S.C. §§ 651 et seq.) only as it relates to Hazardous Substances, and the Florida Laws governing hazardous materials and solid waste.

"Environmental Liabilities" means any Liability relating to (a) the disposal, storage, transportation, Release, recycling, or the arrangement for such activities of Hazardous Substances from the CR-3 Facility; (b) the presence of Hazardous Substances in, on or under the CR-3 Facility, regardless of how the Hazardous Substances came to rest at, on or under the CR-3 Facility; and (c) the failure of the CR-3 Facility to be in compliance with any Environmental Laws.

"EPA" means the United States Environmental Protection Agency and any successor agency thereto.

"Environmental Permit" means any federal, state or local permits, licenses, approvals, consents, registrations or authorizations required by any Governmental Authority with respect to the CR-3 Facility or the NRC-Licensed Site under or in connection with any Environmental Law, including any and all orders, consent orders or binding agreements issued or entered into by a Governmental Authority under any applicable Environmental Law, but excluding the NRC License.

"Excluded Facilities" means the facilities on the Crystal River Site (and the real property upon which the same are located) that are not related to the CR-3 Facility, including the switchyard, operating and non-operating fossil fuel-fired (coal, natural gas) power generation facilities cooling towers, coal delivery and storage areas, ash storage area, office buildings, warehouses, barge handling dockets, railroad, and the other buildings or facilities that are not to be Decommissioned hereunder as identified in Attachment 1.

"Exclusion Area" has the meaning as defined under NRC rules and regulations, and with respect to the CR-3 Facility, means the area within the Exclusion Area Boundary that completely surrounds the ISFSI, as depicted in Attachment 1.

"Exclusion Area Boundary" means the boundary that completely surrounds the ISFSI and defines the Exclusion Area, as depicted in Attachment 1.

"FDEP Letter" means the letter from the Florida Department of Environmental Protection dated February 15, 2019, a copy of which is attached hereto as Attachment 13.

"Federal Trade Commission Act" means the Federal Trade Commission Act of 1914 (15 U.S.C. Section 41 et seq.), as amended.

"First Amendment to DSA" means an amendment to this Agreement to be entered into by Company and Contractor on or before the Closing Date, whereby the Parties agree to amend this Agreement by attaching the mutually agreed exhibits and attachments to be finalized between the Contract Date and the Closing Date, including [redacted], the Environmental Permits, the Non-Environmental Permits and the Project Schedule.

"Force Majeure" means events or circumstances that are outside the non-performing Party's reasonable control, e.g., acts of God; war; acts of civil disobedience; acts of terrorism; fires; explosions; earthquakes; epidemics; landslides; hurricanes or windstorms; riots; floods; sabotage or other malevolent acts; labor strikes or other similar acts of industrial disturbance (other than acts of employees of the nonperforming Party or its Affiliates); acts, delays in acting, or failure to act of a Governmental Authority (including a taking or condemnation); or any similar events or occurrences; provided, however, an event shall only be considered an event of Force Majeure to the extent: (a) the non-performing Party is unable to prevent, avoid, overcome or cure such event through the exercise of commercially reasonable efforts; (b) such event is not the proximate result of the non-performing Party's act, omission, fault or negligence, including failure to maintain equipment in good working order, failure to comply with any contract, or failure to comply with all applicable Laws; and (c) such event results in a material impairment of the non-performing Party's ability to perform; provided, further, that the unavailability of a disposal facility for Low Level Waste, is not an event of Force Majeure.

"Fourth Amendment to Amended and Restated NDF Agreement" means the Fourth Amendment to the Amended and Restated NDF Agreement in the form attached hereto as Exhibit F.

"Good Utility Practices" means any of the practices, methods and activities generally accepted by a significant portion of the nuclear industry in the United States of America as good practices applicable to: (a) nuclear generating facilities that have ceased operating in anticipation of decommissioning, or the decommissioning of a nuclear generating facility, as applicable, of similar design, size and capacity as the CR-3 Facility; or (b) any of the practices, methods or activities which, in the exercise of reasonable judgment by a prudent Person decommissioning a nuclear facility of similar design, size and capacity as the CR-3 Facility, in light of the facts known at the time the decision was made, would reasonably have been expected to accomplish the desired result at a reasonable cost and consistent with good safety practices and applicable Laws including Nuclear Laws and Environmental Laws. Good Utility Practices are not intended to be limited to the optimal practices, methods or acts to the exclusion of all others.

"Governmental Authority" means any federal, state, local provincial, foreign, international or other governmental, regulatory or administrative agency, taxing authority, commission, department, board, or other government subdivision, court or tribunal.

"Greater Than Class C Waste" means radioactive waste that contains radionuclide concentrations exceeding the values in Table 1 or Table 2 of 10 C.F.R. § 61.55, and therefore is currently not generally acceptable for disposal at existing (near surface) low level radioactive waste disposal facilities.

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PARTY: OPC
DESCRIPTION: Confidential DSA -
CONFIDENTIAL DN. 03533-2020

Docket No. 20190140-EI
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Proffered by: Public Counsel

Short title: _____

Witness(s): _____

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NEW ENGLAND PUBLIC RADIO.

Decommissioning Test: NorthStar Uses Vermont Yankee As Launch Pad For Other Power Plant Jobs

By Howard Weiss-Tisman • Oct 27, 2019

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NorthStar Group Services is hoping its experience with decommissioning the Vermont Yankee nuclear power plant in Vernon will recommend the company to take similar jobs around the country.

Howard Weiss-Tisman / VPR

Originally published on October 28, 2019 5:29 pm

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The company that's tearing down the Vermont Yankee nuclear power plant hopes to use its experience to bid on similar jobs around the country. To do that, it's got to get the decommissioning process right in Vermont.

Train cars roll slowly into, and out of, the Vermont Yankee property in Vernon. The cars bring in massive machines, specialty tools and rigs that are used to cut up and transport the nuclear reactor, and all the machinery and buildings around it.

And on their way out, the train cars haul away specially-made boxes, packed with low-level radioactive waste.

Trains haul machinery in and low-level radioactive waste out of the Vermont Yankee site.

Credit Howard Weiss-Tisman / VPR

NorthStar Group Services, the New York-based industrial demolition company that now owns Vermont Yankee, is taking it down piece by piece. It's the first time a third-party company has purchased a reactor outright before decommissioning and removing the plant.

This is according to Julie Lieberman, a senior project manager with the national consulting firm Concentric Energy Advisors, which worked with NorthStar and the Vermont Public Utility Commission on the Vermont Yankee deal.

She said the so-called third-party decommissioning transactions work well for energy utilities, who would otherwise have to rely on contractors to tear down the plants that are closing due to low natural gas prices and the relative higher costs of nuclear power.

"We anticipate the trend toward third-party decommissioning transactions to accelerate as the nuclear industry continues to face a precipitous decline," she said. In the meantime, Lieberman said industry stakeholders will be watching NorthStar's progress.

"Only time will tell if taking on the risks of buying plants to profitably decommission them will prove to be a good bet," she said.

NorthStar Group Services CEO Scott State walks around the Vermont Yankee nuclear power plant, which the company hopes can be a kind of test site that allows them to take on more nuclear plant decommissioning jobs in the future.

Credit Howard Weiss-Tisman / VPR

Scott State is CEO of NorthStar. He's well aware of how much is riding on what happens in Vernon.

"If you don't get the first one right, you don't get the next one," State said. "And it's important that we demonstrate for the entire industry that these plants can be retired, that, you know, that they are plants that ran a long time, generated a lot of energy, but ultimately they have to be removed."

All of the spent fuel at Vermont Yankee, the high-level nuclear waste, has already been removed.

For now it's being stored right outside the plant, in sealed casks. Northstar is seeking federal approval to move it to Texas.

While the spent fuel is packed away, everything else that's left – the metal, the concrete and the machinery that's been in close contact with the nuclear reactor – is considered low-level radioactive waste.

And that's what workers are chopping up and packing into canisters and shipping boxes, which are then transported to a waste depository in Texas. On a recent afternoon at Vermont Yankee, a small piece of

the reactor lid, which once weighed 60 tons and was almost two-feet thick at its widest point, was packed in a box waiting to be moved out.

An empty canister waits to be filled with low-level radioactive waste from the Vermont Yankee plant in Vernon.

Credit Howard Weiss-Tisman / VPR

About 70 workers are taking apart the power plant. And this is the work State thinks NorthStar can do all over the country, at nuclear reactors that have reached the end of their working life.

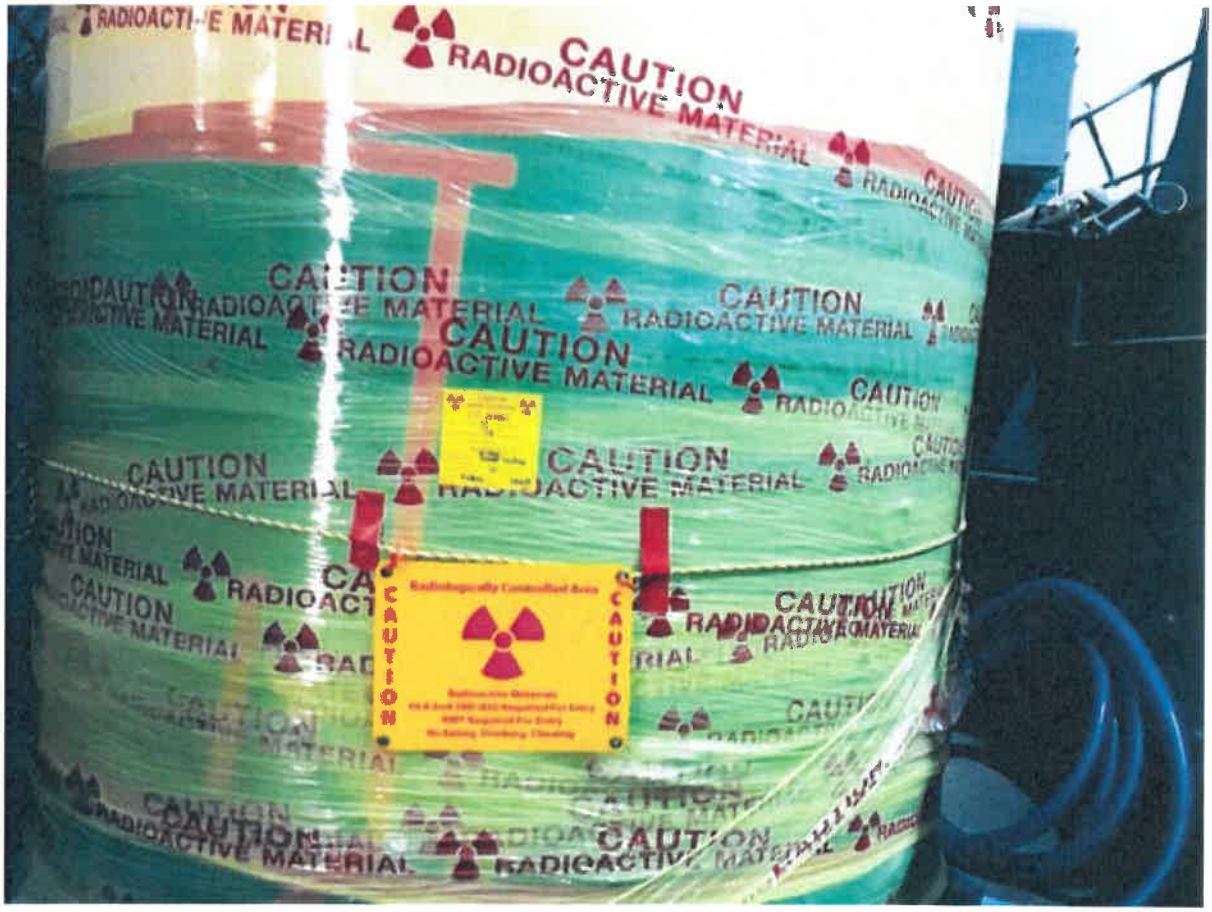
But that doesn't seem like such a good idea to a D.C. area nonprofit that advocates for a nuclear-free and carbon-free world. Tim Judson with the Nuclear Information Resource Service says this kind of business model needs a lot more scrutiny.

The Nuclear Regulatory Commission does sign off on the license transfer when a utility turns a plant over to a company like NorthStar. But Judson says once the work begins inside the plant, no one's really watching to make sure it's done safely.

"The NRC has a very hands-off approach to decommissioning," Judson said. "We think that the NRC is essentially abdicating its responsibility by approving these really anomalous and dangerous arrangements."

At the core of these business deals are the decommissioning trust funds that have built up over years. The NRC requires original plant owners to invest in these accounts, and every nuclear power plant in the country has hundreds of millions of dollars for decommissioning.

Vermont Yankee had about $506 million in its fund when NorthStar took control of the Vernon reactor. And if the company can finish the work on time and under budget, then it stands to cash in on part of what's left.



The D.C. area nonprofit Nuclear Information Resource Service, which advocates for a nuclear-free and carbon-free world, is concerned about the safety and oversight of companies like NorthStar Group Services.

Credit Howard Weiss-Tisman / VPR

In the meantime, NorthStar will compete with at least two other companies as it tries to win contracts to decommission other plants. Judson says with so much money at stake, these companies should be held accountable for the work they're promising to do.

"We think there's a lot of risk associated with this business," Judson said. "Potentially with the decommissioning funds going bankrupt, and before sites are fully cleaned up, the potential for communities to be left with reactor sites that are not fully decommissioned."

NorthStar thinks it can handle up to six of these jobs at a time, moving demolition teams into and out of reactor sites around the country as specific projects are completed.

Apart from its decommissioning work in Vernon, the company is currently tearing down buildings in multiple locations, some in the middle of large cities with people and cars and buses moving underneath.

So working in Vermont, in a vacant power plant in the middle of corn fields, is a lot less stressful according to State, NorthStar's CEO.

Decommissioning work on the reactor floor is filmed at the Vermont Yankee nuclear power plant in Vernon. NorthStar Group Services CEO Scott State said the work at that location, in an empty power plant among corn fields, is comparatively less stressful than the company's other jobs in urban areas.

Credit Howard Weiss-Tisman / VPR

"I don't want to downplay the significance, but day-to-day work for us, this is typically the kinds of things we're doing at hundreds of sites around the country," State said. "There's nothing different about it. We're not working on sites with radiological contamination every day, but it's just another one of many hazards we plan for when we do our work."

The Vermont Department of Public Service plans to post the monthly fund balance of Vermont Yankee's decommissioning trust fund on its website, along with a monthly summary of expenditures.

NorthStar has used about $65.5 million so far, with another $10.5 million to be disbursed in November, and the department's director for public advocacy, Jim Porter, said the state has retained experts to review the monthly financial withdrawals.

"The department's experts conclude that amounts disbursed to date are in line with what is expected for this project," he said.

The state health department and agency of natural resources also say NorthStar is meeting its reporting obligations.

NorthStar says the Vermont Yankee decommissioning is three or four years ahead of schedule. The company already has a contract with a second power plant outside of Tampa, Florida.

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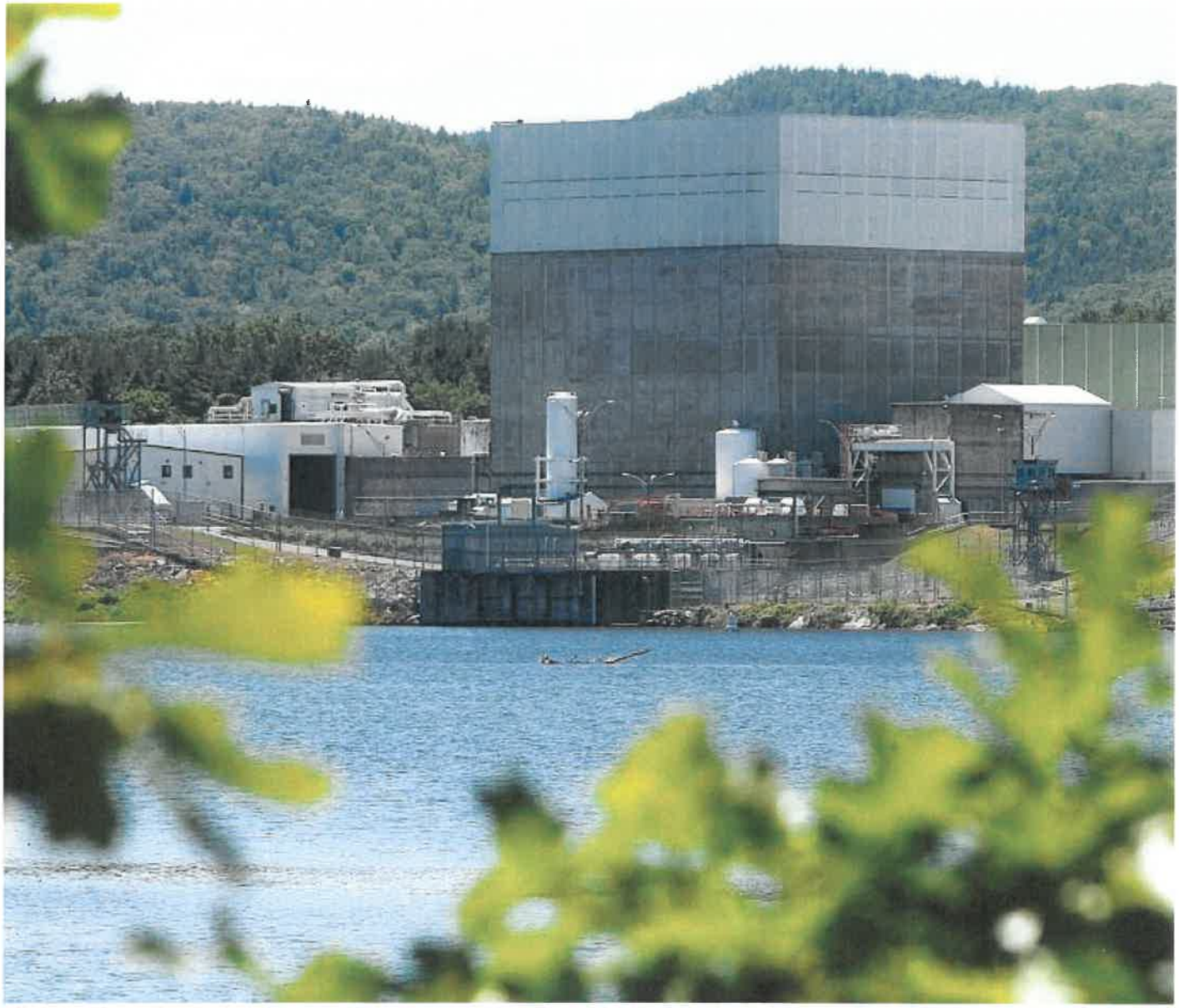
Vermont Yankee Transfer Approved, NorthStar Will Decommission Plant

By John Dillon • Dec 7, 2018



State utility regulators have approved the transfer of the closed Vermont Yankee nuclear plant to NorthStar, a demolition company that has has committed to decommissioning the plant decades earlier than previously planned.

'Power Struggle' Documentary Chronicles Efforts To Close Vermont Yankee Nuclear Plant

By Ric Cengeri • Oct 26, 2017

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The Vermont International Film Festival is screening a documentary on Sunday chronicling the grassroots movement to close the Vermont Yankee nuclear power plant, and the events both global and local that surrounded its closure in 2014.

Vermont Yankee Buyer Says Success Here Could Mean Big Business Elsewhere

By John Dillon • Jun 1, 2018

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Why would anyone want to buy a closed nuclear power plant, along with its long legacy of radioactive waste?

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Decommissioning Test: NorthStar Uses Vermont Yankee As Launch Pad For Other Power Plant Jobs

By HOWARD WEISS-TISMAN (/PEOPLE/HOWARD-WEISS-TISMAN) • OCT 27, 2019

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NorthStar Group Services is hoping its experience with decommissioning the Vermont Yankee nuclear power plant in Vernon will recommend the company to take similar jobs around the country.
(/sites/shared/npr/styles/x_large/nprshared/202001/774198921.jpg)

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HOWARD WEISS-TISMAN / VPR

Originally published on October 28, 2019 5:29 pm

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And on their way out, the train cars haul away specially-made boxes, packed with low-level radioactive waste.

(https://www.vpr.org/sites/vpr/files/styles/placed_wide/public/201910/train-vermont-yankee-vpr-weiss-tisman-20191021.jpg)

Trains haul machinery in and low-level radioactive waste out of the Vermont Yankee site.
CREDIT HOWARD WEISS-TISMAN / VPR

NorthStar Group Services, the New York-based industrial demolition company that now owns Vermont Yankee, is taking it down piece by piece. It's the first time a third-party company has purchased a reactor outright (https://www.vpr.org/post/vermont-yankee-transfer-approved-northstar-will-decommission-plant#stream/0) before decommissioning and removing the plant.

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(https://www.vpr.org/sites/vpr/files/styles/placed_wide/public/201910/scott-state-northstar-vpr-weiss-tisman-20191021.jpg)

NorthStar Group Services CEO Scott State walks around the Vermont Yankee nuclear power plant, which the company hopes can be a kind of test site that allows them to take on more nuclear plant decommissioning jobs in the future.
CREDIT HOWARD WEISS-TISMAN / VPR

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For now it's being stored right outside the plant, in sealed casks (https://www.vpr.org/post/vermont-yankee-moves-last-its-spent-nuclear-fuel-site-storage-casks). Northstar is seeking federal approval to move it to Texas.

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(https://www.vpr.org/sites/vpr/files/styles/placed_wide/public/201910/empty-waste-cannister-vermont-yankee-vpr-weiss-tisman-20191021.jpg)

An empty canister waits to be filled with low-level radioactive waste from the Vermont Yankee plant in Vernon.
CREDIT HOWARD WEISS-TISMAN / VPR

About 70 workers are taking apart the power plant. And this is the work State thinks NorthStar can do all over the country, at nuclear reactors that have reached the end of their working life.

But that doesn't seem like such a good idea to a D.C. area nonprofit that advocates for a nuclear-free and carbon-free world. Tim Judson with the Nuclear Information Resource Service says this kind of business model needs a lot more scrutiny.

The Nuclear Regulatory Commission does sign off (https://www.vpr.org/post/nrc-approves-vermont-yankee-license-transfer#stream/0) on the license transfer when a utility turns a plant over to a company like NorthStar. But Judson says once the work begins inside the plant, no one's really watching to make sure it's done safely.

"The NRC has a very hands-off approach to decommissioning," Judson said. "We think that the NRC is essentially abdicating its responsibility by approving these really anomalous and dangerous arrangements."

At the core of these business deals are the decommissioning trust funds that have built up over years. The NRC requires original plant owners to invest in these accounts (https://www.nrc.gov/waste/decommissioning/finan-assur.html), and every nuclear power plant in the country has hundreds of millions of dollars for decommissioning.

Vermont Yankee had about $506 million in its fund (https://www.reformer.com/stories/yankee-sale-to-northstar-completed,561454) when NorthStar took control of the Vernon reactor. And if the company can finish the work on time and under budget, then it stands to cash in on part of what's left.

(https://www.vpr.org/sites/vpr/files/styles/placed_wide/public/201910/radioactive-material-vermont-yankee-vpr-weiss-tisman-20191021.jpg)

The D.C. area nonprofit Nuclear Information Resource Service, which advocates for a nuclear-free and carbon-free world, is concerned about the safety and oversight of companies like NorthStar Group Services.

CREDIT HOWARD WEISS-TISMAN / VPR

In the meantime, NorthStar will compete with at least two other companies as it tries to win contracts to decommission other plants. Judson says with so much money at stake, these companies should be held accountable for the work they're promising to do.

"We think there's a lot of risk associated with this business," Judson said. "Potentially with the decommissioning funds going bankrupt, and before sites are fully cleaned up, the potential for communities to be left with reactor sites that are not fully decommissioned."

NorthStar thinks it can handle up to six of these jobs at a time, moving demolition teams into and out of reactor sites around the country as specific projects are completed.

Apart from its decommissioning work in Vernon, the company is currently tearing down buildings in multiple locations, some in the middle of large cities with people and cars and buses moving underneath.

So working in Vermont, in a vacant power plant in the middle of corn fields, is a lot less stressful according to State, NorthStar's CEO.

(https://www.vpr.org/sites/vpr/files/styles/placed_wide/public/201910/Vermont-Yankee-video-screens-vpr-weiss-tisman-20191021.jpg)

Decommissioning work on the reactor floor is filmed at the Vermont Yankee nuclear power plant in Vernon. NorthStar Group Services CEO Scott State said the work at that location, in an empty power plant among corn fields, is comparatively less stressful than the company's other jobs in urban areas.

CREDIT HOWARD WEISS-TISMAN / VPR

"I don't want to downplay the significance, but day-to-day work for us, this is typically the kinds of things we're doing at hundreds of sites around the country," State said. "There's nothing different about it. We're not working on sites with radiological contamination every day, but it's just another one of many hazards we plan for when we do our work."

The Vermont Department of Public Service plans to post the monthly fund balance of Vermont Yankee's decommissioning trust fund on its website (https://publicservice.vermont.gov/content/nuclear_decommissioning_citizens_advisory_panel_ndcap/history) along with a monthly summary of expenditures.

NorthStar has used about $65.5 million so far, with another $10.5 million to be disbursed in November, and the department's director for public advocacy, Jim Porter, said the state has retained experts to review the monthly financial withdrawals.

"The department's experts conclude that amounts disbursed to date are in line with what is expected for this project," he said.

The state health department and agency of natural resources also say NorthStar is meeting its reporting obligations.

NorthStar says the Vermont Yankee decommissioning is three or four years ahead of schedule. The company already has a contract with a second power plant (https://www.northstar.com/duke-energy-plans-to-decommission-retired-florida-nuclear-plant-by-2027-nearly-50-years-sooner-than-originally-scheduled/) outside of Tampa, Florida.

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Docket No. 20190140-EI
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FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 37
PARTY: OPC
DESCRIPTION: Investors See Huge Profits

northjersey.com

WATCHDOG

Investors see huge profits from old nuclear plants, but it could cost taxpayers

Christopher Maag NorthJersey

Published 5:00 a.m. ET Jun. 19, 2019 | **Updated 11:29 a.m. ET Jun. 20, 2019**

Shutting down nuclear plants is set to become a multi-billion dollar business. If that business fails, critics say, your tax dollars - and possibly your safety - could be on the line. Learn more in our USA TODAY NETWORK Northeast project, The Nuclear Option.

Some of the nation's richest investors are betting they see profit where no one else does: tearing down America's aging nuclear reactors.

Among them is one of the most recognized names from the Reagan Administration, former Secretary of the Navy John Lehman.

Lehman's plans are shrouded in secrecy. The hedge fund that bears his name does not disclose basic information about its finances.

But an examination of deals made by the hedge fund since 2017 to raise money and acquire firms, makes it clear the company sees a pot of gold for the taking — some $60 billion accumulating in trust funds owned by nuclear power plants — all of it bankrolled by ratepayers.

"We believe that the profitability potential remains high," said Daryl Walcroft, a lead adviser at the accounting firm PwC, which recently released a 20-page report titled "Ready, set...shut down!" to lure new investors.

If they succeed, investors will control a brand-new industry. If they fail, as some independent experts predict, those investors — including public employee pension funds for teachers, police and firefighters — could lose hundreds of millions of dollars.

Past projects blew their budgets by up to half a billion dollars, forcing ratepayers to cover the costs. Current projects may be even riskier, as companies saddle the trust funds with new cleanup costs that federal rules never envisioned, and do not allow.

Such deals may enable big investors like Lehman to take their profit and walk away, leaving "taxpayers to bear the financial burden and responsibility for finishing the work," Massachusetts Attorney General Maura Healey said in a petition to federal regulators.

For years, power companies supervised reactor cleanup themselves. Nearly every project was a financial failure. In some cases the cost approached $1 billion, double the original estimate.

"I would say all of the early projects went over budget," said Scott State, CEO of NorthStar Group, a company that deconstructs buildings.

Industry leaders like State believe they can decommission a nuclear plant faster and cheaper, and share the savings with their investors as profit.

"They're taking on a big risk that they can do a big job," said Tom LaGuardia, an engineer widely regarded as the world's top expert on decommissioning costs.

To some people, a closed nuclear plant is a dangerous place contaminated with radioactive waste.

To investors, each reactor is a pot of gold.

Federal law requires electricity companies to save money in trust funds for the eventual closure and cleanup of nuclear reactors. Fund totals ranged from $286.6 million for Beaver Valley reactor 1 in Pennsylvania to $1.5 billion for Diablo Canyon reactor 2 in California, according to 2016 tallies from the Nuclear Regulatory Commission, the latest available.

Nationwide, trust fund balances topped $60 billion in 2016, the NRC found. They grew to $70 billion by 2018, according to The Callan Institute, which advises fund managers. And the total may soon rise to $90 billion, according to PwC, a major accounting firm formerly known as PriceWaterhouseCoopers.

And unlike virtually every other big construction project, companies decommissioning nuclear plants get paid upfront, before work even starts.

"Having pre-funded work is very good," said State, of NorthStar.

Powerhouses including the PwC accounting firm also see profit opportunity in teardown deals.

"(T)he growth of this market is accelerating more quickly than predicted," according to the company's recent report. "Already, we are seeing qualified decommissioning specialists and institutional investors clamoring through various deals to own" decommissioning companies.

Here's what that clamor looks like. After serving as President Ronald Reagan's Secretary of the Navy, John Lehman founded J.F. Lehman & Co., a hedge fund that invested $1.9 billion primarily in defense and aerospace industries, according to the company's website.

In 2016, J.F. Lehman & Co. sought to raise $700 million. It attracted more than 48 investors, including "leading public and private pension funds" who together invested $883 million, more than 25 percent above Lehman's original plan, according to a Lehman press release.

Investments included $40 million from the Teachers' Retirement System of Oklahoma. Another $36.5 million came from three public employee retirement funds in Connecticut. The public employee retirement fund in Montgomery County, Maryland invested $23 million, the Arkansas Teacher Retirement System invested $14.6 million, and the retirement system for municipal police in Louisiana invested $12.5 million, according to the funds' annual reports, for a total of at least $126.6 million. Together, these funds own $75.9 billion in assets.

Three months after Lehman announced it had beaten its fundraising goal, in June 2017, it gained a foothold in the decommissioning industry by acquiring NorthStar. The following month, it announced a partnership with a company now called Orano, which specializes in nuclear teardowns. In January 2018 Lehman bought Waste Control Specialists, which owns radioactive waste disposal sites in Texas.

The deals allow Lehman's companies to save money at every step of decommissioning, said State, who is CEO of both NorthStar and Waste Control Specialists.

"We own and control everything we need to do this work," State said.

Important details about Lehman's companies remain unknown, including how much cash each keeps for emergencies. Even less is known about Holtec's decommissioning venture Comprehensive Decommissioning International, which is co-owned with SNC-Lavalin, a large Canadian engineering firm.

The company is secretive about its finances, refusing to disclose basic information about its revenue, assets or ability to handle contingencies. "Both Holtec and SNC-Lavalin supplied the capital for establishing CDI," Joe Delmar, a Holtec spokesman, said by email.

The financial success or failure of decommissioning a nuclear reactor hinges on one thing: the size of its trust fund.

"The most unique risk in this market has to do with the health of the trust fund," said Walcroft, lead adviser on American infrastructure projects for PwC.

In Holtec's application to buy Pilgrim nuclear power plant in Massachusetts, and in NorthStar's application to buy the Vermont Yankee plant, both companies said they expect each reactor's trust fund to pay for the entire project.

"I am telling you they will get it done with the trust fund because they're really good," said Rod McCullum, senior director of used fuel and decommissioning at the Nuclear Energy Institute, the industry's powerful trade group.

Consultants, financial experts and three federal agencies are not so confident. Plant owners must prove their trust funds meet the Nuclear Regulatory Commission's

minimum formula, which the commission estimates will generate enough money to clean up a nuclear plant's radioactive contamination.

But the commission's own Office of Inspector General, as well as the Government Accountability Office and Pacific Northwest National Laboratory, together published four reports since 2011 finding the formula — created in the early 1980s — is so old that it consistently underestimates the amount of money needed.

"The NRC estimate is still low," said LaGuardia, who said he has completed cost estimates on 90 percent of all decommissioning projects in North America.

Moreover, Holtec and NorthStar plan to use trust funds in ways the NRC never envisioned. According to federal rules, trust money may be used only to clean up nuclear contamination. Other jobs, like managing spent reactor fuel and removing asbestos or lead, must use other money.

"It comes from their own money, their own profits," said Richard Turtil, a senior financial analyst for the NRC.

That's not what NorthStar and Holtec have in mind. At Pilgrim, Holtec requested an exemption allowing the trust fund to cover $541 million in spent fuel management and site restoration costs. NorthStar requested a similar exemption at Vermont Yankee for $425 million. Both companies stated the funds will have sufficient money to cover the additional work, and provide them with profits.

"This very substantial amount — over a billion dollars — in Pilgrim's [trust fund] will be sufficient to cover the estimated cost of decommissioning and spent fuel management, as well as site restoration," Holtec said in a filing to the NRC.

Some current and former regulators disagree. If granted, the exemption "poses a significant risk that insufficient funds will exist" to clean the site, Massachusetts Attorney General Maura Healey told the NRC.

"Certainly, I think the funds are sufficient to cover the cost of the cleanup," Gregory Jaczko, former chairman of the Nuclear Regulatory Commission, said in May at a Congressional briefing. "But I'm not sure that they're sufficient to cover the costs of the cleanup and a very nice level of leftover benefit for the company."

Finally, there's the question of cost overruns. The cost to decommission Yankee Rowe nuclear plant in Massachusetts was estimated at $370 million in 1994. By the time it was finished in 2003, costs rose by an extra $266 million, according to book co-authored by LaGuardia. At Connecticut Yankee the final bill was $931 million, more than double original estimates.

"Almost invariably in the work I've done, the costs were greater than expected," said Julia Moriarty, senior vice president of The Callan Institute, which advises nuclear fund managers.

Work accidents and changing government rules caused many projects to run over-budget, LaGuardia said, but the biggest driver of cost increases is finding pockets of previously unknown contamination.

Companies learned from these mistakes, State and Delmar said. Teardown experts now perform more intensive site studies; avoid cutting apart reactors with tools like grit sanders that spread contamination around a site; and often control the final disposition of nuclear waste. This means they can simply "rip and pitch" waste into trucks or trains bound for disposal sites, State said, rather than spend valuable workers' time decontaminating materials on-site.

"They're getting smarter now, and they're doing site characterization first," LaGuardia said. "They know the risks. If they're not comfortable with their cost estimating method, they're not going to be in this business."

Site studies remain imperfect, however.

"Site conditions are never known with absolute precision," Warren K. Brewer, a decommissioning expert, told the Vermont Public Utilities Commission.

All construction companies build cushions into their plans to cover unexpected costs. At Vermont Yankee, NorthStar set aside 10 percent of the trust fund's $500 million for contingency and profits, far below standard industry practice, according to Brewer and Gregory Maret, another expert hired by the state.

Even small changes in site conditions or state regulations could increase costs by up to $200 million, Brewer found, enough to overwhelm the contingency fund.

"That's a very risky business play," LaGuardia said of NorthStar's plan.

Eventually NorthStar and its partners committed $200 million in additional financial assurances, said Dan Dane, a financial expert involved in the negotiations.

Holtec's contingency at Pilgrim is even smaller. The company will set aside 17 percent of Pilgrim's projected $1.3 billion trust fund for surprises, it told the NRC.

But as Healey found, Holtec plans to spend all but $3.6 million of the $1.3 billion in its trust fund on basic decommissioning work.

"In other words, its contingency allowance covers costs it expects to incur," Healey wrote in her petition. "Holtec's attempt to account for contingencies and uncertainty risk is woefully deficient."

Leaders of decommissioning companies are confident they can avoid the failures of the past.

"Does that mean every project will go perfectly? No," State said. "But I don't lose any sleep thinking we aren't going to be able to do these projects in precisely the way we say we expect we can."

Consultants think failure is an option, however.

"I think the vast majority will do just fine," said Moriarty, who has monitored nuclear funds for 20 years. "I think there will be cases where they run into problems."

If even a handful of decommissioning projects goes broke, current and future public employees in at least five states stand to lose $126.6 million in investments. In its report, PwC advised investors to consider, "Do I have the financial capability to manage the nuclear decommissioning trust fund as required by the NRC — or to make up the difference if it falls short?"

If investors can't step up, some worry it will fall to "taxpayers to bear the financial burden and responsibility for finishing the work," Healey told the NRC.

"If they go bankrupt," Moriarty said, "I assume the taxpayers are on the hook."

Email: maag@northjersey.com

Data reporter Frank Esposito contributed to this report.

Docket No. 20190140-EI
Cross-Examination
Hearing Exhibit

Exhibit No.: 1

Proffered by: Public Counsel

Short title: _____

Witness(s): _____

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 38
PARTY: OPC
DESCRIPTION: Vermont Order 8880

STATE OF VERMONT
PUBLIC UTILITY COMMISSION

Case No. 8880

Joint Petition of NorthStar Decommissioning Holdings, LLC, NorthStar Nuclear Decommissioning Company, LLC, NorthStar Group Services, Inc., LVI Parent Corporation, NorthStar Group Holdings, LLC, Entergy Nuclear Vermont Investment Company, LLC and Entergy Nuclear Operations, Inc., and any other necessary affiliated entities to transfer ownership of Entergy Nuclear Vermont Yankee, LLC, and for certain ancillary approvals, pursuant to 30 V.S.A. §§ 107, 231, and 232	Evidentiary Hearings in Montpelier, Vermont May 10, 11, and 14, 2018

Order entered: 12/06/2018

PRESENT: Margaret Cheney, Commissioner
Sarah Hofmann, Commissioner

APPEARANCES: *See Appendix A*

ORDER APPROVING ACQUISITION OF ENTERGY NUCLEAR VERMONT YANKEE, INC. BY NORTHSTAR DECOMMISSIONING HOLDINGS, LLC AND GRANTING OTHER REQUESTS SUBJECT TO MEMORANDUM OF UNDERSTANDING

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I. INTRODUCTION

In this Order, the Vermont Public Utility Commission ("Commission" or "PUC") approves the transfer of ownership of the Vermont Yankee Nuclear Power Station in Vernon, Vermont ("VY Station") from Entergy,[1] the current owner, to NorthStar,[2] a national provider of large-scale demolition services. The VY Station, which began operation in 1972, stopped generating electric power in December 2014. Upon the change in ownership, NorthStar will be responsible for decommissioning the VY Station, restoring the site, and managing the spent nuclear fuel that is stored there.

The primary benefit of the proposal for Vermont is NorthStar's commitment to accelerate

[1] For purposes of the petition and generally in this Order, "Entergy" refers to Entergy Nuclear Vermont Investment Company, LLC ("ENVIC") and Entergy Nuclear Operations, Inc. ("ENOI"), and any other necessary affiliated entities to transfer ownership of Entergy Nuclear Vermont Yankee, LLC ("ENVY").

[2] For purposes of the petition and generally in this Order, "NorthStar" refers to NorthStar Decommissioning Holdings, LLC ("NDH"), NorthStar Nuclear Decommissioning Company, LLC ("NorthStar NDC"), NorthStar Group Services, Inc., LVI Parent Corporation, and NorthStar Group Holdings, LLC.

by more than 30 years the schedule for decommissioning and restoring most of the VY Station site and releasing it for other uses. NorthStar will begin these activities no later than 2021 and plans to complete them no later than the end of 2030. According to NorthStar's accelerated schedule, by 2030 most above-ground structures will be removed,[3] underground structures will be removed to a depth of at least four feet, and the site will be regraded and seeded. In contrast, Entergy had not planned to begin decommissioning before 2053 and, possibly, not until 2068 under its deferred decommissioning or SAFSTOR plan.

Under both proposals, all spent fuel assemblies would remain in dry storage within the Independent Spent Fuel Storage Installation ("ISFSI") portion of the VY Station site until the U.S. Department of Energy removes the spent nuclear fuel.

Upon the acquisition by NorthStar of an Entergy subsidiary, NorthStar will own the VY Station, the spent nuclear fuel stored on the site, the site property, and more than $500 million of dedicated trust funds that NorthStar will use for decommissioning and site restoration activities. NorthStar anticipates that the trust funds and claim recoveries from the U.S. Department of Energy ("DOE") will be adequate to cover the costs of decommissioning, site restoration, and spent fuel management activities.

During this proceeding, the parties generally agreed that earlier decommissioning and site restoration of the VY Station site would be preferable to delaying the work for decades. However, they initially differed about whether the resources available to NorthStar and the assurances offered by NorthStar and Entergy would be adequate to ensure the successful completion of decommissioning and site restoration activities.

In early March 2018, NorthStar and Entergy (collectively, the "Joint Petitioners") entered into a memorandum of understanding ("MOU") with all the active parties to this case except the Conservation Law Foundation ("CLF"). The MOU includes commitments by the Joint Petitioners to provide additional financial assurances to support the completion of the project and describes processes for site characterization work, corrective actions, reporting, and oversight by Vermont State agencies, as well as certain site restoration standards. All the MOU parties now

[3] All above-ground structures are to be removed from the site by 2030 other than the spent nuclear fuel storage infrastructure and related security facilities, an electric transmission switchyard, an administrative office building, and a portion of a railroad spur. Exh. PUC-2 (MOU at ¶ 5.f.).

support approval of the Joint Petitioners' proposals subject to the terms and conditions of the MOU.

The significant remaining issues involve disagreements between CLF and the MOU parties about the adequacy of available financial resources and assurances to support project completion if the actual costs significantly exceed NorthStar's estimates. CLF maintains that the provided financial assurances are not adequate to protect against risks related to known and unknown sources of contamination at the site. CLF contends that the Joint Petitioners need to provide additional financial assurances to ensure project completion. The MOU parties argue that the MOU contains meaningful financial commitments to cover cost overruns and other risk mitigation measures that help ensure project completion even if these assurances do not eliminate all risk. The MOU parties also maintain that the current proposals represent an improvement over the status quo not just in terms of the timing of project commencement and completion but also in terms of the financial commitments and assurances that are available to support project completion.

The proposed transfer of the VY Station to NorthStar is also contingent on approval by the U.S. Nuclear Regulatory Commission ("NRC"). On October 11, 2018, after the end of the evidentiary hearings and the filing of briefs and reply briefs in this case, the NRC issued an order approving the transfer of NRC licenses for the VY Station to NorthStar. The NRC concluded that NorthStar is financially and technically qualified to hold the NRC licenses.

In this Order, we approve the proposals of NorthStar and Entergy subject to the requirements of the March 2018 MOU. We conclude, based on the evidence in the record, that the proposed acquisition and related proposals as modified by the MOU will promote the public good and the general good of the State. In reaching this conclusion, we have balanced any remaining risks of the proposals (as modified by the MOU) against the benefits and the risk reductions that they provide. Specifically, we take note of the following important elements:

- The entire package of financial assurances and risk mitigation measures that are set forth in the Joint Petitioners' proposals and the MOU, especially the enhanced financial assurances related to site restoration and the various risk mitigation measures related to non-radiological site characterization, required reporting, and oversight by State agencies as set forth in the MOU;

- The NRC order and the conclusions regarding NorthStar's financial and technical qualifications, including the determination, based in part on an independent cash flow analysis, that NorthStar had provided reasonable assurance of obtaining the funds necessary to cover the estimated cost of decommissioning the VY Station and the spent nuclear fuel storage area and the cost of spent fuel management in accordance with applicable NRC requirements; and
- The expected benefits for the State of Vermont and the broad support for the current proposals among the public and the parties (including State, regional, and local governmental authorities) with varied perspectives, views, interests, and responsibilities.

We conclude that the benefits of the current proposals outweigh the remaining potential risks for the State. We note that the risks associated with delayed decommissioning are likely to be equally or even more substantial and would likely be borne by those who did not benefit from the VY Station's electrical output. The additional financial assurances and other valuable risk-mitigation measures provided for in the MOU were of critical importance to us in reaching our decision, as was the broad support for the MOU among State agencies, other parties, and the public.

We emphasize the importance of the post-closing oversight activities by the relevant State agencies as further mitigation of any remaining risks. In addition to other measures that have the potential to mitigate post-closing risks, NorthStar will provide monthly summaries of all expenditures at the site, informative and detailed annual certifications regarding the project's progress, and prompt notification of material developments affecting NorthStar or the project. The State agencies will also have significant rights in overseeing the project, including the right to inspect books and records, to access the site, and to object to disbursements from certain sources of funds. The protections afforded by the MOU should allow for early identification of issues and, if necessary, reassessment of plans and schedules before available funds and resources are substantially reduced and reasonable alternatives become more limited. Given the importance of these protections, we trust that the State agencies will retain appropriate resources, devote the necessary time and attention, and constructively manage and coordinate their efforts to ensure that the available tools are used effectively in accordance with the interests of Vermont.

To ensure appropriate legal documentation of certain financial assurances in the MOU, this Order is conditioned on the receipt of notification, prior to the transfer of ownership, from the Vermont Department of Public Service ("Department" or "DPS") that the Department is satisfied, based on a review of the final form of certain insurance and escrow documents, that the documents meet the requirements of the MOU and, to the extent reasonably possible, will protect the interests of the State of Vermont in the event of NorthStar's insolvency.

We appreciate the collaborative efforts of NorthStar, Entergy, State agencies, regional authorities, town officials, and the other parties to the MOU to reach an agreement that we believe is beneficial for Vermont. The collaborative efforts that led to the MOU provide a substantial and realistic basis for similar cooperation, transparency, and productive consultations during the decommissioning and site restoration process. Although we are persuaded by the arguments made by the MOU parties, we also commend CLF for its efforts in identifying potential concerns with the proposed transaction following the MOU. These efforts, and the efforts of the MOU parties to address concerns raised by CLF, have, in our view, been constructive in considering and resolving this case.

II. PROCEDURAL HISTORY AND EVIDENTIARY RECORD

The procedural history in this case is set forth in Appendix B to this Order.

During the evidentiary hearing before the Commission, all prefiled testimony and exhibits set forth in the stipulated joint exhibit list (joint exhibit-1) were admitted into the evidentiary record. In addition, on October 24, 2018, the Commission proposed on its own motion to admit supplemental testimony and exhibits filed after the evidentiary hearing. No party objected to the admission of the supplemental testimony and exhibits or requested further process with respect to these documents. Accordingly, the following written supplemental testimony and exhibits are admitted into the evidentiary record: supplemental testimony of Scott State filed on May 23, June 21, July 3, and October 19, 2018, and all exhibits filed with such testimony (exhibits JP-SES-19 through JP-SES-27); [4] and supplemental testimony of T. Michael Twomey filed on June 21, 2018. The Commission also admits into the record the amendments to

[4] These exhibits include the NRC order (exh. JP-SES-24), related NRC documents (exhs. JP-SES-25 to 27), and a revised support agreement (exh. JP-SES-23).

paragraph 13 of the MOU filed with the Commission on July 31, October 30, and December 3, 2018, as exhibits PUC-5, PUC-6, and PUC-7, respectively.[5]

III. POSITIONS OF THE PARTIES

On March 2, 2018, NorthStar and Entergy (the "Joint Petitioners") entered into a memorandum of understanding with the following other parties to this case: the Department, the Vermont Agency of Natural Resources ("ANR"), the Elnu Abenaki Tribe, the Abenaki Nation of Missisquoi, the Windham Regional Commission, the New England Coalition on Nuclear Pollution, Inc. ("NEC"), the Town of Vernon Planning and Economic Development Commission, and, as to certain provisions, the Vermont Attorney General's Office (collectively, together with the Joint Petitioners, "the MOU Parties"). The MOU Parties jointly request or support the Commission's approval of the Joint Petitioners' proposals subject to the terms and conditions of the MOU.[6]

CLF opposes the petition and maintains that the financial assurances available under the MOU are insufficient. It contends that the Commission should deny the proposed transfer of ownership and responsibility for the operation of VY Station. In the alternative, it requests that the Commission direct the Joint Petitioners to provide additional financial assurances to support the proposed transfer.

IV. PUBLIC COMMENTS

The Commission received numerous comments from members of the public who attended the public hearings held on April 6, 2017, in Vernon and on April 12, 2018, in Brattleboro, and received approximately 50 written comments. The Commission appreciates those members of the public who took the time to convey their views on the proposed transaction. Such comments help guide the Commission's attention to specific issues that otherwise might not be raised in the case.

Public comments play an important role in helping to ensure a thorough exploration of the factors that the Commission should consider in developing an evidentiary record, even

[5] Any party that wishes to challenge the admission of the amendments to the MOU may contest such admission in a separate motion or in any motion for reconsideration it may file.

[6] *See* exh. PUC-2 (MOU at ¶ 1) and Vermont Attorney General's Office Brief of 6/11/18 at 1.

though public comments are not evidence in a case. These comments also help the Commission understand how its decisions affect citizens across the state.

The public comments the Commission received discussed a variety of benefits and concerns. Some of the issues addressed include:

- The importance of thoroughly investigating the proposed transfer;
- The economic, public, and environmental benefits of accelerated decommissioning and the economic, public and environmental risks if accelerated decommissioning is unsuccessful;
- The improvements to the proposed transfer resulting from the MOU;
- The importance of rigorous oversight throughout the decommissioning process and site restoration process by the State of Vermont;
- Ensuring the adequacy of the nuclear decommissioning trust and site restoration trust funds;
- Ensuring that the terms of the proposed transfer are sufficiently protective and are actually achieved;
- Concerns about Entergy's liability for the VY Station site;
- The financial and technical qualifications of NorthStar and its partners;
- Opportunities for continued public involvement in the decommissioning process; and
- Concerns about the ultimate disposition of the waste stored at the VY Station site.

In the many comments that we received, very few members of the public stated a preference for the longer decommissioning process that would result under Entergy's proposed SAFSTOR alternative. Instead, most commenters voiced cautious support for the accelerated decommissioning plan proposed by NorthStar, with two primary concerns: that the proposal needed to be thoroughly vetted prior to approval, and that the entire cleanup process needed to be closely monitored to ensure compliance. A large majority of the members of the public who spoke at the public hearing in Brattleboro after the parties reached the agreement in the MOU supported the transfer of the VY Station to NorthStar.

The Commission also received comments from the Vermont Division for Historic Preservation ("DHP"), the six citizen members of the Vermont Nuclear Decommissioning Citizens Advisory Panel ("VNDCAP"), and Associated Industries of Vermont ("AIV"). In its

comments, DHP reported that the archaeological studies performed at the VY Station did not identify any significant archaeological sites but did identify sections of the property where there had been no prior disturbance. DHP also states that it did not seek to intervene as a party to the case because it "concluded that the proposed transfer of ownership did not have the potential to adversely affect historic sites, because the site has been significantly disturbed and the scope of work described as part of the decommissioning process did not indicate any plans to impact previously undisturbed areas."[7] The citizen members of the VNDCAP concluded that it was in "everyone's best interest for the plant to be decommissioned and the site restored to use as soon as possible," but urged the Commission to carefully review the petition with special attention paid to the offered financial assurances and the proposed site restoration standards.[8] AIV, which intervened but did not actively participate as a party in this case, expressed support for the proposed transaction at the second public hearing.[9]

V. PROPOSED TRANSACTIONS AND APPLICABLE STANDARDS

See Appendix C for simplified organizational charts showing the current Entergy ownership structure and the post-transfer NorthStar structure.

Entergy Nuclear Vermont Yankee, LLC ("ENVY") and Entergy Nuclear Operations, Inc. ("ENOI") hold a certificate of public good ("CPG") issued by the Commission under Section 231 to own and operate the VY Station. Entergy Nuclear Vermont Investment Corporation, LLC ("ENVIC") currently holds all membership interests of ENVY.

The Joint Petitioners propose that the indirect ownership of the VY Station be transferred from Entergy to NorthStar through the sale of 100% of the membership interests of ENVY to North Star Decommissioning Holdings, LLC ("NDH"). They also seek to substitute a NorthStar company, NorthStar Nuclear Decommissioning Company ("North Star NDC"), for Entergy Nuclear Operations, Inc. ("ENOI") as the joint holder (together with a renamed ENVY) of the CPG to own and operate the VY Station. The Joint Petitioners further request that the Commission consent to the issuance by ENVY of a promissory note in the approximate amount

[7] DHP Comments dated 10/18/17.

[8] VNDCAP Comments dated 4/6/17.

[9] Comments of B. Sayre at public hearing on 4/12/18.

of $145 million to a newly created subsidiary of ENVIC, Vermont Yankee Asset Retirement Management, LLC ("VYARM").

In addition, the Joint Petitioners seek (a) modification of the Final Order in Docket 7862 to allow for the contribution of the assets of the site restoration trust into a segregated sub-account of the nuclear decommissioning trust and (b) approval of the site restoration standards set forth in the MOU.

The specific approvals requested in the petition are largely governed by 30 V.S.A. §§ 107,[10] 231,[11] and 232.[12] The applicable standard to be met under each of these statutory sections is generally the same—whether the proposed transaction will promote the public and the general good of the State.

The factors considered by the Commission in making this determination necessarily vary from case to case depending on specific circumstances and evidence related to the effects of the proposed actions on Vermont, ratepayers, and others. In cases involving changes in the ownership and operation of a business subject to the Commission's jurisdiction, the Commission evaluates, among other things, the technical, managerial, financial, and reputational attributes of the proposed owner or operator.[13] Under the circumstances specific to the future ownership and

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[10] Section 107 requires a company, such as NDH and its parent companies, seeking to "directly or indirectly acquire a controlling interest in any company subject to the jurisdiction" of the Commission to first obtain approval of the Commission. The Commission may grant approval "upon finding that such an acquisition will promote the public good." 30 V.S.A. § 107(a) and (b).

[11] The Joint Petitioners' proposal that NorthStar NDC replace ENOI as the joint holder of the CPG to own and operate the VY Station requires Commission approval under Section 231. Section 231 requires an entity such as NorthStar NDC "that desires to own or operate a business over which the Public Utility Commission has jurisdiction" to petition the Commission and for the Commission to determine "whether the operation of such business will promote the general good of the State." 30 V.S.A. § 231(a).

[12] Section 232 prohibits ENVY from issuing the proposed promissory note without the consent of the Commission and a finding by the Commission that the issuance "will promote the general good of the State." 30 V.S.A. § 232(a).

[13] *Amended Joint Petition of Cent. Vermont Pub. Serv. et al.*, Docket 7770, Order of 6/15/12 at 23. *See also Amended Petition of Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc., for amendment of their certificate of public good and other approvals*, Docket 7862, Order of 3/28/14 at 16-17 and 38; *Joint Petition of Green Mountain Power Corporation, Northern New England Energy Corporation and Northstars Merger Subsidiary Corp.*, Docket 7213 Order at 9-10; *Joint Petition of Bell Atlantic Corp. and GTE Corp. for approval of Agreement and Plan of Merger*, Docket 6150, Order of 9/13/99 at 48-49; *Joint Petition of New England Telephone & Telegraph Co. and Bell Atlantic Corp. for Approval of a Merger*, Docket 5900, Order of 2/26/97 at 5-9; *Petition of Entergy Nuclear Vermont Yankee and Entergy Nuclear Operations for approval of an indirect transfer of control*, Docket 7404, Order of 6/24/10 at 6-8; *Joint petition of Central Vermont Public Service Corporation and Vermont Electric Cooperative for approval of the transfer of assets of VEC's Southern District territory to CVPS*,

operation of the VY Station, the Commission needs to assess whether NorthStar VY will have adequate funding and financial resources to successfully complete the proposed decommissioning and site restoration process, whether NorthStar and the team it has assembled have the technical skills, expertise, and experience to manage and conduct required decommissioning and site restoration activities, and whether NorthStar has demonstrated that it will be a fair partner for Vermont.

Each of the matters for which Commission action is requested is part of an interrelated set of proposals as set forth in the petition and the MOU that are tied to the proposed acquisition of ENVY by NorthStar. Accordingly, these action items must be evaluated individually and in the context of the entire set of proposals. In determining whether the proposals as a whole promote the public and general good of the State of Vermont, the most important considerations for the Commission relate to the benefits, risks, and feasibility of NorthStar's decommissioning and site restoration plans and the extent to which the interests of Vermont will be adequately and appropriately protected if the proposals are approved.

VI. FINDINGS

A. Background

1. The VY Station is a former electricity generating facility that, when operational, employed a boiling water nuclear reactor. The VY Station is located adjacent to the Connecticut River in the town of Vernon, Windham County, Vermont. Exh. DPS-DSD-5 (Post-Shutdown Decommissioning Activities Report ("PSDAR") of 12/19/14 at 1).

2. ENVY, a Delaware limited liability company, owns the VY Station. Joint Petition of 12/16/16 ("Petition") at 3 (¶1) – 4 (¶ 6); Scott E. State for Joint Petitioners ("State") pf. at 16.

Docket 7210, Order of 12/4/06 at 9-11; *Joint Petition of Citizens Communications Company to sell, and Vermont Electric Cooperative to purchase Citizens' distribution assets and a portion of its transmission assets*, Docket 6850, Order of 3/1/04 (as reissued 3/29/04) at 13, 14, 16, 17, 22, 23, & 27; *Joint Petition of Vermont Marble Power Division of Omya Inc. and Central Vermont Public Service Corporation for sale of assets*, Docket 7660, Order of 6/10/11 at 36-37; *Petition of Northern New England Energy Corporation for approval of an Indirect Transfer of Control of Vermont Gas Systems, Inc. and Green Mountain Power Corporation*, Docket 7734, Order of 6/10/11 at 6-7; *Joint Petition of Central Vermont Public Service Corporation and the Town of Readsboro for approval of the acquisition by CVPS of the Town of Readsboro Electric Light Department's distribution system assets and service territory*, Docket No. 7688, Order of 7/8/11 at 6-7.

3. ENVY is owned by ENVIC, a Delaware limited liability company that holds 100% of ENVY's membership interests. Petition at 3 (¶ 1); State pf. at 16.

4. ENVY and ENOI, a Delaware corporation that maintains its principal place of business in Mississippi, together hold a CPG pursuant to 30 V.S.A. § 231(a) to own, operate, and decommission the VY Station. Petition at 3 (¶ 1).[14]

5. ENVY, ENVIC, and ENOI are wholly owned indirect subsidiaries of Entergy Corporation. Daniel S. Dane for DPS ("Dane") pf. at 51.

6. Entergy Corporation is an integrated energy company engaged primarily in electric power production and retail distribution operations. As of the end of 2016, Entergy Corporation (a) had total assets of nearly $46 billion and total shareholders' equity of more than $8 billion, (b) had annual revenue of approximately $10.8 billion, (c) owned and operated power plants with approximately 30,000 megawatts of electric generating capacity, which included nearly 10,000 megawatts of nuclear power, and (d) had more than 13,000 employees. Exh. DPS-DSD-33 at 5, 26-27 and 32.

7. ENVY, as the owner of the VY Station, and ENOI, as the operator of the VY Station, together hold two licenses issued by the NRC for the VY Station: a facility operating license (No. DPR-28) and a general license for the Independent Spent Fuel Storage Installation ("ISFSI"). In addition to being the NRC-licensed operator of the VY Station, ENOI is the operator of several other nuclear power plants. Dane pf. at 51; exh. JP-SES-24 (NRC Order at 1); exh. JP-SES-Supp-1 (figure 1).

8. On January 12, 2015, ENOI notified the NRC that it had permanently ceased power operations at the VY Station. Exh. DPS-DSD-4 (Revised PSDAR of 4/6/17 at 5).

9. Entergy's 2014 PSDAR for the VY Station provides for deferred decommissioning ("SAFSTOR") with plant decontamination and dismantlement activities commencing in 2068 and completed by 2075. Steven Scheurich for Joint Petitioners ("Scheurich") pf. at 13-14; Brian Winn for DPS ("Winn") pf. at 3; exh. DPS-DSD-5; exh. DPS-WKB/GAM-2 at 6.

10. In a December 2013 settlement agreement with Vermont State agencies, ENVY committed to obtain NRC authorization to begin radiological decommissioning within 120 days

[14] Docket 6545, CPG issued on 6/13/02; Docket 7862, CPG issued on 3/28/14.

of ENVY making a reasonable determination that funds in the nuclear decommissioning trust are adequate to complete decommissioning and remaining spent nuclear fuel management activities. Entergy currently estimates that it could begin decommissioning activities in 2053 or earlier if adequate funds are available in the nuclear decommissioning trust ("NDT"). Scheurich pf. at 15-16; T. Michael Twomey for Joint Petitioners ("Twomey") pf. at 7-8; Winn pf. at 3 (footnote 1); exh. JP-TMT-2 (¶ 7); exh. DPS-DSD-5 (Attachment 2, ¶ 7).

11. Entergy's 2014 PSDAR included a commitment to the NRC for Entergy Corporation to provide a parent company guarantee of up to $40 million if "additional financial assurance beyond the amounts contained in the remaining trust fund" is required to complete radiological decommissioning and spent fuel management at the VY Station. Twomey pf. at 9; exh. DPS-DSD (PSDAR of 12/14/14 at iii and 21).

12. Pursuant to the Memorandum of Understanding in Docket 7862 ("Docket 7862 MOU"), Entergy established a separate trust fund dedicated to funding site restoration at the VY Station and deposited $25 million in this site restoration trust. Twomey pf. at 8 and supp. pf. (5/4/18) at 2; State supp. pf. (3/10/17) at 4; Docket 7862, Order of 3/24/14 (Attachment B at 3-4).

13. Also, pursuant to the Docket 7862 MOU, ENVY committed to provide a parental guarantee in the amount of $20 million for the site restoration trust, which can be eliminated if the site restoration trust balance exceeds $60 million. Twomey pf. at 8-9; Docket 7862, Order of 3/24/14 (Attachment B at 4).

14. As of March 31, 2018, the nuclear decommissioning trust ("NDT") had a balance of $559.7 million, and the site restoration trust ("SRT") had a balance of $30.9 million. Twomey supp. pf. (5/4/18) at 2.

15. Entergy estimates that disbursements from the NDT for the period April 1 through December 31, 2018, will total $66.5 million. Twomey supp. pf. (5/4/18) at 3.

16. Excess funds remaining in the nuclear decommissioning trust after the completion of decommissioning are to be paid to Vermont Yankee Nuclear Power Corporation, which is currently a wholly owned subsidiary of Green Mountain Power Corporation, for the benefit of

electric consumers.[15] Docket 6545, Order of 6/13/02 at 4, 11, 37-38, 158 & Appendix D; 2018-ELEC-AR-04883, Annual Report of Green Mountain Power Corporation (FERC Form No. 1 at 123).

17. Under the site restoration trust agreement, excess funds remaining in the site restoration trust after completion of site restoration, as certified by the Commission, will be paid to ENVY.[16] State pf. 24-25; exh. JP-SES-2 (§§ 5.01 and 5.02).

18. In August 2018, ENOI notified the NRC that all spent fuel assemblies at the VY Station had been transferred from the spent fuel pool and placed in dry storage within the ISFSI. Exh. JP-SES-25 at 3.

19. Entergy has two revolving credit facilities in the approximate amount of $145 million that were used to finance construction of the second ISFSI pad, procurement of dry storage systems, and transfer of fuel from the spent fuel pool to the ISFSI. The credit facilities are supported by a guarantee of the full outstanding amount by Entergy Corporation. Twomey pf. at 9.

20. ENVY has made or will soon make a Round 3 claim against the DOE for the recovery of its spent fuel management costs, which was expected to include, among other costs, approximately $145 million for the second ISFSI pad construction and the costs associated with the 2017-18 transfer of spent nuclear fuel from the spent fuel pool to the second ISFSI pad ("Round 3 DOE Claim"). Exh. PUC-2 (MOU ¶ 3.b.); exh. JP-SES-25 at 3. *See also* finding 18-20, above.

B. Overview of NorthStar and Proposed Transactions

NorthStar

21. NorthStar, through North Star Group Services Inc. and its subsidiaries, provides demolition and remediation services throughout the United States. It employs 3,500 employees

[15] ENVY is permitted to retain half of any excess funds to the extent they are associated with additional contributions to the NDT made by ENVY. Docket 6545, Order of 7/11/02 at 6-11 and Order of 7/15/02. *See also* Docket 7862, Order of 3/28/14 at 86, 90-91. It is the Commission's understanding that ENVY has not made additional contributions to the NDT since its acquisition of the VY Station.

[16] Note that upon NorthStar's acquisition of ENVY (and its change in name), the renamed ENVY, NorthStar VY, will remain entitled to the payment of any excess funds in the site restoration sub-account. *See also* exh. PUC-2 (MOU ¶ 3.a.).

and maintains offices in 26 locations nationwide. State pf. at 5; Jeffrey Adix for the Joint Petitioners ("Adix") pf. at 1.

22. NorthStar has extensive experience in decommissioning and abatement work at energy-related facilities and the contaminants often found at such facilities, including radioactive material, mercury, lead, asbestos, and polychlorinated biphenyl ("PCB"). NorthStar has decommissioned power facilities throughout the United States subject to state and federal regulations. State pf. at 6.

23. NorthStar has experience in the nuclear sector related to the decommissioning of four NRC-regulated research reactors at university sites and has also performed decommissioning work at DOE sites. No notice of violation from any government agency has been received, and no U.S. Occupational Safety and Health Administration recordable incident has occurred, on any of the nuclear projects involving NorthStar. State pf. at 6-8.

24. Although NorthStar has relevant expertise in decommissioning, abatement, and cleanup projects, NorthStar has never taken the lead on a nuclear decommissioning project, nor a project of the scale and complexity of the decommissioning of the VY Station. Winn pf. at 7; exh. DPS-BEW-2; Gregory A. Maret for DPS ("Maret") sur. pf. (12/1/17) at 4.

25. NorthStar Group Services, Inc. is wholly owned by LVI Parent Corporation, which is wholly owned by NorthStar Group Holdings, LLC. Both LVI Parent Corporation and NorthStar Group Holdings, LLC are passive holding companies that own only shares of stock or membership interests in their subsidiaries. Adix pf. at 1; Dane pf. at 14.

26. NorthStar Group Services, Inc. (together with its subsidiaries) had total assets of more than $380 million at the end of 2016. It had gross revenue of more than $650 million and income from operations of $30 million in 2015. Adix pf. at 3.

27. NorthStar Group Holdings, LLC is wholly owned by JFL-NGS Partners, LLC, which purchased the company on June 12, 2017, from its prior owners and made significant capital investments in NorthStar. Dane pf. at 15; exh. DPS-DSD-8; Adix reb. pf. (10/17/17) at 5

28. Through its indirect ownership interests in JFL-NGS Partners, LLC, J.F. Lehman and Company, a private equity firm, holds a majority ownership stake in NorthStar and has ultimate operating control of NorthStar. Dane sur. pf. (12/1/17) at 9; exh. DPS-DSD-8.

29. Because of the capital investments in June 2017, NorthStar was able to decrease its total debt by approximately $100 million and to amend and extend its senior credit agreement, which now provides for an undrawn revolving line of credit. Adix reb. pf. (10/17/17) at 5; Dane sur. pf. (12/1/17) at 8; exh. DPS-DSD-9; exh. DPS-DSD-37.

30. The amended senior credit agreement includes a term loan with a principal balance of $140 million at execution, along with the undrawn revolving credit line with an aggregate principal limit of $55 million. Pricing is based on a spread of 4.5% for London Interbank Offered Rate loans, with other base rate and prime rate pricing structures available. The term loan maturity date is currently May 31, 2021. Dane sur. pf. (12/1/17) at 10; exh. DPS-DSD-45.

31. The June 2017 capital investment improved NorthStar's liquidity and its financial position relative to its previously thin capitalization and high leverage. Dane sur. pf. (12/1/17) at 8; Adix reb. pf. (10/17/17) at 5; Scheurich reb. pf. (10/17/17) at 11.

32. NorthStar believes its new ownership will help NorthStar with its strategic plan and support the continued growth and financial stability of NorthStar. Adix reb. pf. (10/17/17) at 5.

Proposed Transactions

33. The Joint Petitioners propose that NorthStar Decommissioning Holdings, LLC ("NDH") acquire ownership of ENVY through the purchase of 100% of ENVY's membership interests pursuant to a Membership Interest Purchase and Sale Agreement ("MIPA") by and among NDH, NorthStar Group Holdings, LLC, ENVIC, and ENVY. Petition at 3 (¶ 2) & 4 (¶ 6); State pf. at 17; exh. JP-TMT-8.

34. Following NDH's acquisition of ENVY, ENVY will be renamed NorthStar Vermont Yankee, LLC ("NorthStar VY").[17] Petition at 3 (¶ 2); State pf. at 17.

35. Prior to the closing of the acquisition, ENVY will transfer certain limited assets that are not needed for decommissioning and site restoration to an Entergy subsidiary, Vermont Yankee Asset Retirement Management, LLC ("VYARM"). Scheurich pf. at 12; State pf. at 17.

[17] There is no change in the legal entity that will directly own the VY Station before or after NDH's acquisition of ENVY. ENVY and NorthStar VY will be the same legal entity. As a result of the acquisition, that legal entity (ENVY/NorthStar VY) will be owned, and the VY Station will be indirectly owned, by NorthStar and neither will be directly or indirectly owned by Entergy and Entergy Corporation.

36. Prior to the closing of the acquisition, VYARM will either assume existing Entergy credit facilities related to the construction of the ISFSI and spent fuel transfer, including an ENVY credit facility used to fund the transfer of spent nuclear fuel, that were guaranteed by Entergy Corporation, or Entergy will enter into a new credit facility through VYARM that will be used to advance ENVY the amount needed to pay off ENVY's existing credit facility at closing. State supp. pf. (3/10/17) at 3; Twomey pf. at 9; exh. JP-SES-SUPP-1 (Attachment 1 at 5).

37. ENVY/North Star VY will issue a promissory note at closing to the Entergy subsidiary, VYARM, in the approximate amount of $145 million to cover the amount of Entergy's costs to construct the second ISFSI pad and to transfer spent nuclear fuel from the spent fuel pool to that pad in 2017 and 2018. NorthStar VY will be required to repay VYARM upon NorthStar VY's receipt of sufficient proceeds from the Round 3 DOE Claim (which receipt is anticipated in 2023) except that, under the circumstances specified in paragraph 3. c. of the MOU, NorthStar VY will retain and deposit into an escrow account the first $40 million of Round 3 DOE Claim proceeds. If the available proceeds from the Round 3 DOE Claim are insufficient to repay the note, NorthStar VY will pay the remaining balance only after NorthStar completes decommissioning and site restoration of the VY Station site (except for the ISFSI area and the structures that will remain on the site as set forth in the MOU). State pf. at 19-20, supp. pf. (3/10/17) at 2-3 and reb. pf. (10/17/17) at 5-6; Twomey pf. at 10; Scheurich reb. pf. (10/17/17) at 11-12; exh. PUC-2 (MOU ¶ 3. b. & c.); exh. JP-SES-SUPP-1 (Attachment 1 at 5-6). *See also* finding 91, below.

38. At the time of NDH's acquisition of ENVY, ENVY will own the VY Station, its spent nuclear fuel, the NDT, the SRT, and the real property within the VY Station site. ENVY will also retain all rights and obligations under the $145 million note issued to the Entergy subsidiary, VYARM, and under ENVY's Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste with the DOE. State pf. at 17; JP-SES-25 at 18; JP-SES-24 at 3.

39. Following NDH's acquisition of ENVY, NorthStar Nuclear Decommissioning Company ("NorthStar NDC") will replace ENOI as the co-holder of the Section 231 CPG. NorthStar NDC will assume ENOI's obligations under PUC Orders and NRC licenses related to

the VY Station site. NorthStar NDC will be the NRC-licensed operator of the VY Station. Petition at 4-5 (¶ 7) & 8; State pf. at 9 & 18; exh. JP-SES-Supp-1; exh. JP-SES-24; exh. JP-SES-26.

40. NDH and North Star NDC are wholly owned subsidiaries of NorthStar Group Services, Inc. State pf. at 9; Dane pf. at 14; exh. JP-SES-Supp-1 (figure 2).

41. The MOU proposes site restoration standards for the VY Station that have been agreed to by the Joint Petitioners and other parties to the MOU. Exh PUC-2 (MOU ¶¶ 1.e. & 5).

42. The Joint Petitioners propose that assets currently held in the site restoration trust be contributed to a segregated sub-account of the nuclear decommissioning trust to facilitate the concurrent conduct of decommissioning and site restoration activities. State pf. at 23-24; exh. JP-SES-2 (Site Restoration Trust Agreement); exh PUC-2 (MOU ¶¶ 1.f, 2.a.(2), and 6.).

C. Plans Related to Decommissioning and Site Restoration

43. NorthStar has committed to begin active decommissioning and site restoration at the VY Station site no later than 2021 (and possibly as early as 2019) and to complete those tasks at the VY Station site (except at the ISFSI and VELCO switchyard) no later than the end of 2030 (and possibly as early as 2026). State pf. at 21; exh. PUC-2 (MOU at 1-2); exh. DPS-WKB/GAM-2 at 7.

44. NorthStar VY will obtain a $25 million letter of credit, substantially in the form of attachment 2 to the MOU, payable to a decommissioning completion trust, if NorthStar VY does not start decommissioning activities on or before January 1, 2021, or complete radiological decommissioning and site restoration of all portions of the site other than the ISFSI area by December 31, 2030. State pf. at 18-19; exh. PUC-2 (MOU ¶ 2.a. (4) and attachment 2); exh. JP-TMT-9; exh. DPS-DSD-30.

45. Decommissioning and site restoration of the ISFSI area cannot occur until the spent nuclear fuel is removed from the site. NorthStar plans to complete these activities after the DOE removes the spent nuclear fuel from the ISFSI area. State pf. at 21-22, 43.

46. NorthStar submitted a revised PSDAR to the NRC on April 6, 2017, to advise the NRC of changes in actions and schedules previously set forth in Entergy's 2014 PSDAR and to update the information previously provided. The revised PSDAR, which sets forth NorthStar's

plans for prompt decommissioning, is contingent on the closing of NDH's acquisition of ENVY. Exh. DPS-DSD-4; exh. JP-SES-24; exh. JP-SES-25 at 5.

47. NorthStar will perform most of the decommissioning and site restoration work itself. State pf. at 10; exh. DPS-DSD-19.

48. For specialized tasks that NorthStar does not itself perform, NorthStar will engage non-affiliated companies under fixed-price arrangements. State pf. at 10.

49. NorthStar plans to perform tasks that correspond to 75% to 80% of the total costs of the project and expects to pay 20% to 25% of the costs of decommissioning and site restoration activities to non-NorthStar affiliates. State pf. at 10 and supp. pf. (5/4/18) at 1; exh. DPS-DSD-19.

50. NorthStar plans to perform radiological decommissioning and site restoration work concurrently as an integrated process. State pf. at 21, 40; exh. PUC-2 (MOU at 1-2).

51. Entergy will contribute the site restoration trust assets into a separate sub-account of the nuclear decommissioning trust prior to the closing. State pf. at 23; exh. JP-SES-2; exh. PUC-2 (MOU ¶¶ 2.a.(2) & 6).

52. NorthStar developed a model that outlines the cash flows associated with the project, the funds available to accomplish the project in the nuclear decommissioning trust and the site restoration trust, and expected recoveries from the DOE related to spent nuclear fuel management costs. NorthStar's budget is intended to enable NorthStar, with the assistance of specialized expert subcontractors, to accomplish the decommissioning and restoration of the VY Station site (other than the ISFSI) decades earlier than Entergy planned in its 2014 PSDAR. State pf. at 21 and supp. pf. (3/10/17) at 3-4; exh. JP- SES-Supp-1; Scheurich pf. at 13-19; exh. DPS-DSD-4; exh. DPS-DSD-5.

53. NorthStar's model assumes that assets in the nuclear decommissioning trust[18] will have average net annual growth of 2%. State pf. at 41.

54. NorthStar's modeling of the project is based on a series of fixed-price contracts with a budget for each of the more than 900 individual tasks included in a pay-item disbursement schedule dated September 8, 2016. State pf. at 12; exh. PUC-2 (MOU ¶ 2.a.(6)).

[18] References in this Order to the nuclear decommissioning trust (NDT) after the closing of the acquisition of ENVY include the site restoration trust (SRT) sub-account unless otherwise indicated.

55. There is a 10% contingency amount built into each line item in NorthStar's pay-item disbursement schedule. State pf. at 38 and reb. pf. (10/17/17) at 10, 33; exh. DPS-DSD-26; exh. DPS-DSD-40.

56. NorthStar will withdraw from the nuclear decommissioning trust the entire allotted amount for a task (including the contingency amount) and, subject to the MOU, may retain any excess over the actual cost of the task for its own account. State pf. at 38; exh. DPS-BEW-3; exh. DPS-DSD-40; exh. PUC-2 (MOU ¶ 2).

57. If the actual cost of a line-item task exceeds the estimated cost to complete that task, NorthStar will bear that expense. Under no circumstance may a withdrawal from the nuclear decommissioning trust for a specific task exceed the amount for that task listed in the pay-item disbursement schedule. State pf. at 38; exh. DPS-BEW-3; exh. PUC-2 (MOU ¶ 2(a)(6)).

58. In addition to the costs of decommissioning and site restoration, NorthStar will continue to incur costs related to the management of spent nuclear fuel in the ISFSI until the fuel is removed from the site. The ISFSI area can be decommissioned, released, and restored only after the DOE removes the spent nuclear fuel from the site. NorthStar expects over time to recover its spent nuclear fuel management costs from the DOE (as damages for the DOE's partial breach of its obligation to remove spent fuel from the VY Station). State pf. at 19-20, 22, 40-41, 43-44.

59. The NRC will allow NorthStar the limited use of up to $20 million of funds from the nuclear decommissioning trust on a revolving basis for purposes of spent nuclear fuel management. For purposes of this limitation, the cumulative amount of NDT withdrawals for spent fuel management will be reduced by the amount of any replenishment of the NDT from the DOE recoveries. If unreimbursed spent nuclear fuel management expenses at any one time exceed $20 million, NorthStar will fund the excess expenses from its own resources. State pf. at 41; exh. JP-SES-27 at 4, 9, 12.

60. NorthStar VY will obtain a performance bond in the amount of $4.3 million if there is no settlement with the DOE for reimbursement of spent fuel management expenses by January 1, 2022. If a settlement with the DOE is not reached by January 1, 2024, the amount of the required performance bond will increase to $9.3 million. Exh. JP-SES-24 at 6-7.

61. After the DOE removes the spent nuclear fuel from the ISFSI area, NorthStar will decommission and restore the ISFSI area. State pf. at 43-44.

62. NorthStar's estimated costs for radiological decommissioning and NRC license termination are $498,450,000; for spent nuclear fuel management are $287,802,000; and for site restoration are $25,272,000. State supp. pf. (3/10/17) at 4.

NorthStar and its non-NorthStar subcontractors

63. NorthStar has or has engaged resources and personnel or has sufficiently detailed plans to engage resources and personnel with the relevant managerial and technical experience and expertise to complete the decommissioning of VY Station as proposed. Winn sur. pf. (12/1/17) at 2 & 3; Winn supp. pf. (5/4/18) at 18; State pf. 5-15; tr. 5/10/18 at 120 (Brewer); exh. JP-SES-SUPP 1 (Application at 12-18 and enclosure 3); findings 21 to 23, above, and findings 63 to 73, below.

64. Orano USA LLC, formerly AREVA Nuclear Materials, LLC ("Orano"), will perform and complete the decommissioning work related to the nuclear reactor. This work will include the segmentation of the nuclear reactor pressure vessel and the vessel internals. State pf. at 10-11; exh. PUC-2 (MOU ¶ 2.d).

65. Orano has experience with reactor vessel segmentation projects and has completed reactor decommissioning work at several nuclear plants since 1999. At the Wuergassen plant in Germany, it segmented the reactor vessel and internals for a boiling water reactor that was similar in type and size to the reactor at the VY Station. State pf. at 13-14; Gregory A. Maret for DPS ("Maret") sur. pf. (12/1/17) at 4.

66. NorthStar will obtain a $25 million guaranty from Orano to support the completion of decommissioning and site restoration activities at the VY Station. This guaranty will terminate upon the removal of the reactor vessel from the VY Station site provided certain conditions are met, including a certification by NorthStar, confirmed by the DPS, that the value of the NDT (including the SRT subaccount) is greater than the combined remaining estimated license termination and site restoration costs. Exh. PUC-2 (MOU ¶ 2.a(2) and 2.d).

67. Orano also will be involved in the long-term management of the spent nuclear fuel in dry storage at the site and will oversee the transfer of the fuel to the DOE when the DOE is ready to accept it. State pf. at 14.

68. Orano has substantial worldwide experience in the dry storage and transportation of spent nuclear fuel for the nuclear industry. State pf. at 14-15.

69. NorthStar has a contractual arrangement with Waste Control Specialists, LLC ("WCS"), which operates a low-level radioactive waste disposal site in Texas. This site includes the compact waste facility created by a compact between Texas and Vermont to dispose of low-level radioactive waste and is one of the few commercial facilities in the United States licensed to dispose of all types of low-level radioactive waste. State pf. at 11.

70. WCS will be involved with on-site waste processing, management, packaging, loading, and the ultimate disposal at the Texas compact waste facility. WCS has provided NorthStar with preferred pricing for the removal of waste from the VY Station site. State pf. at 35-36; State reb. pf. (10/17/17) at 31-32; exh. JP-SES-25 at 21; exh. JP-SES-SUPP-1 (Application at 15-16).

71. NorthStar's decommissioning approach will seek to optimize waste streams for economical waste disposal, taking advantage of both the dedicated compact waste facility for Class A, B, and C low-level radioactive waste and WCS's other disposal cells for exempt waste. State pf. at 11.

72. NorthStar will also retain an engineering firm, Burns & McDonnell, for support with engineering and the termination of the NRC license. State pf. at 11-12.

73. NorthStar plans to retain Haley & Aldrich, LLC, as a subcontractor for non-radiological site characterization work at the VY Station site. This firm has experience and has demonstrated proficiency in performing the types of activities proposed for the VY Station site that fall under ANR's purview. Chuck Schwer for ANR ("Schwer") supp. pf. (5/4/18) at 5.

D. <u>Funds Available for Project; Additional Financial Assurances</u>

74. NorthStar's model and the NRC license transfer application generally contemplate that assets in the nuclear decommissioning trust (including the proposed SRT sub-account) and recoveries from the DOE claims will be sufficient to cover the estimated costs of decommissioning, site restoration, spent nuclear fuel management, and NRC license termination. Dane pf. at 36-37; State pf. at 40-41,43-45 and supp. pf. (3/10/17) at 3-4; Scheurich reb. pf. (10/17/17) at 10-11; exh. JP-SES-SUPP-1 (Application at 19).

75. The NorthStar decommissioning cost estimate represents a reasonable estimate of the cost to complete the known scope of license termination and site restoration. Winn supp. pf. (5/4/18) at 16; Schwer supp. pf. (5/4/18) at 8; Scheurich reb. pf. (10/17/17) at 10-11; exh. JP-SES-24 at 17; exh. JP-SES-25 at 5-6; exh. DPS-WKB/GAM-2 at 7-9.

76. The Joint Petitioners have provided and agreed to financial assurances that, while not eliminating project risks, reduce risks and increase the likelihood that the project will be adequately funded if project costs are higher than currently estimated by NorthStar. State supp. pf. (3/9/18) at 2; Winn supp. pf. (3/9/18) at 3; Winn supp. pf. (5/4/18) at 7; Dane supp. pf. (3/9/18) at 3-10; exh. PUC-2 (MOU ¶¶ 2 and 3). *See also* findings 44 (obligation to obtain letter of credit if start or completion of project activities is delayed), 57 (limitation on withdrawals from NDT), 60 (performance bond for spent fuel management related to timing of DOE settlement), and 66 (Orano guaranty), above, and 77-91, below.

Entergy Contribution to Increase SRT Balance at Closing to $60 Million

77. Pursuant to the MOU, Entergy will contribute to the site restoration trust an amount that will bring the balance of the site restoration trust at the closing of NDH's acquisition of ENVY to $60 million. Exh. PUC-2 (MOU ¶ 3. a.).

78. The State of Vermont will be designated as a material beneficiary of the NDT sub-account holding the SRT assets. As more fully detailed in numbered paragraph 6 of the MOU, all distributions from the NDT sub-account that holds the SRT assets will be used exclusively to pay for site restoration costs, and the Department will have 30 days to object to certain proposed expenditures from this sub-account as specified in the MOU. Exh. PUC-2 (MOU ¶ 6.d.).

Performance Bonds

79. NorthStar will obtain performance bonds or equivalent performance assurance on major subcontracted work with a value of approximately $400 million, substantially in the form of attachment 1 to the MOU. Most project tasks will be subject to performance bonds or similar financial support. State pf. at 38-39; exh. PUC-2 (MOU ¶ 2.a.(3) and attachment 1).

80. The performance bonds will provide protection under certain circumstances related to the completion of contracted tasks if a contractor materially defaults in the performance of its construction contract and fails to complete contracted work in accordance with the contract's terms. State pf. at 38-39; exh. PUC-2 (MOU ¶ 2.a(3) and attachment 1).

Support Agreement

81. NorthStar Group Services, Inc. has agreed pursuant to a parent support agreement to provide funds in an aggregate amount of up to $140 million for required decommissioning and site restoration activities at the VY Station as necessary. State supp. pf. (3/9/18) at 3; exh. PUC-2 (MOU ¶¶ 2.a.(5) and 2.b); exh. JP-SES-22 (Attachment 1); exh. JP-SES-23.

82. Pursuant to the MOU, the Commission may order NorthStar Group Services, Inc. to make payments under the support agreement, provided that such an order is supported by a reasonable determination by the DPS Commissioner and the ANR Secretary that additional work is needed to complete site restoration. Exh. PUC-2 (MOU ¶ 2.b.(1)).

83. NorthStar may not amend, terminate, or assign the support agreement for any reason without first obtaining approval of the PUC and the NRC. The support agreement will remain in place until the NRC grants release of the entire site (including the ISFSI area). Exh. PUC-2 (MOU ¶ 2.b.(2)); State reb. pf. (10/17/17) at 11.

Escrow Account (MOU ¶ 2.c.)

84. Pursuant to the MOU, NorthStar will establish an escrow account to which it will contribute $55 million, with $30 million in funds deposited in the account at the closing of NDH's acquisition of ENVY. After NorthStar has withdrawn the first $100 million from the nuclear decommissioning trust (NDT), NorthStar will contribute "an additional $25 million into the escrow account over time, which shall be accomplished by depositing 10% of each invoice paid with funds from the NDT for decommissioning and site restoration work at the VY Station site." NorthStar expects to withdraw the first $100 million from the NDT before the end of 2021, and projects that the escrow account balance will reach $55 million before the end of 2024. Exh. PUC-2 (MOU ¶ 2.c.).

85. Pursuant to the MOU, withdrawals from the escrow account may be made only with the approval of the Department and ANR provided that reasonable requests for withdrawals for site restoration will not be denied, subject to a determination as to the sufficiency and availability of certain other funding resources. Exh. PUC-2 (MOU ¶ 2.c.(1)).

86. The Department will have an opportunity to review final forms of the escrow agreement documents prior to the closing of the ENVY acquisition. Winn supp. pf. (5/4/18) at 4-5; tr. 5/11/18 at 61 (State).

Pollution Legal Liability Insurance

87. Pursuant to the MOU, NorthStar will obtain a $30 million pollution legal liability insurance product that will provide coverage for site restoration activities to address previously unknown or not fully characterized non-radiological environmental conditions identified at the VY Station site. Exh. PUC-2 (MOU ¶ 2. e. and Attachment 4); exh. CLF-MOH-8.

88. Proceeds from claims under the pollution legal liability insurance coverage will only be available for site restoration activities. Schwer supp. pf. (5/4/18) at 3; tr. 5/10/18 at 149 (Winn).

89. The Department plans to conduct a review of the final pollution legal liability insurance policy prior to closing to ensure that the policy complies with the MOU. Chuck Schwer supp. pf. (5/4/18) at 2-3; Winn supp. pf. (5/4/18) at 4-5.[19]

Round 3 DOE Claim Proceeds; Separate Escrow Account for Certain Proceeds

90. NorthStar will contribute $10 million of expected proceeds from the Round 3 DOE Claim to a decommissioning completion trust dedicated to meeting the liabilities of NorthStar VY. State supp. pf. (3/9/18) at 3; Exh. PUC-2 (MOU ¶ 2.a.(7)); exh. JP-TMT-9.

91. If certain conditions specified in the MOU are not met, NorthStar VY will retain and deposit into a separate escrow account the first $40 million of proceeds received from the Round 3 DOE Claim and shall not transfer those funds to the Entergy subsidiary, VYARM. Funds deposited in this escrow account will be used to fund decommissioning and site restoration activities at the VY Station to the extent that funds in the nuclear decommissioning trust are insufficient or unavailable to complete such activities. Exh. PUC-2 (MOU ¶ 3.c. & 3.d.).

E. NRC Proceedings and Rulings

92. In February 2017, NorthStar and Entergy jointly filed a license transfer application with the NRC. The NRC application was supplemented by filings in April, August, and December 2017 and in May and June 2018. State supp. pf. (3/10/17) at 1 and supp. pf. (5/4/18) at 5-6; exh. JP-SES-supp-1; exh. JP-SES-25.

[19] The Commission notes that the Joint Petitioners stated in their initial brief that they have no objection to the Department engaging an expert to review the pollution legal liability insurance policy "to confirm that its terms are consistent with the MOU and sufficiently protective." Initial Brief of Joint Petitioners Joined by Intervenor Elnu Abenaki Tribe of 6/11/18 at 3.

93. In an order dated October 11, 2018, the NRC approved, subject to conditions, the application for the transfer of the NRC licenses for VY Station and the ISFSI. Exh. JP-SES-24 at 6.

94. In its order, the NRC concluded that NorthStar NDC and NorthStar VY are financially and technically qualified to hold the NRC license for the VY Station and the license for the ISFSI. Exh. JP-SES-24 at 5-6; Exh. JP-SES-25 at 17, 22-23, and 25

95. The NRC determined, based in part on the NRC staff's independent cash flow analysis, that NorthStar had provided reasonable assurance of obtaining the funds necessary to cover the estimated costs of decommissioning the VY Station and the ISFSI and of spent fuel management in accordance with applicable NRC requirements. Exh. JP-SES-24 at 5-6; exh. JP-SES-25 at 12-13, 17, and Attachment 1.

96. The NRC determined that NorthStar provided reasonable assurance that the NRC's technical qualification requirements have been met. The NRC also concluded that the proposed NorthStar "management and technical support organization" and "onsite organization" will adequately support the proposed maintenance and decommissioning activities at the VY Station. Exh. JP-SES-24 at 5-6; exh. JP-SES-25 at 22-23.

F. Site Restoration Process and Standards

Site Characterization; Corrective Actions

97. The MOU requires the submission of a draft comprehensive site investigation work plan within 60 days of the closing of the ENVY acquisition. As more fully detailed in the MOU, the site investigation work plan will be subject to ANR's review and approval and will, among other things, include: a plan to perform groundwater sampling for non-radiological contamination; a plan to characterize below-ground structures that NorthStar proposes to leave in place; a plan for any use of concrete fill; a detailed description of how concrete material will be processed and managed on site; identification of the specific locations where concrete will be managed and used as fill; a plan for any use of off-site materials as fill; and a schedule for the completion of site-investigation activities. Exh. PUC-2 (MOU ¶ 5.d.).

98. For areas of the VY Station site where investigation activities do not create an actual conflict with the Atomic Energy Act, the MOU requires NorthStar to submit a site investigation

report pursuant to Section 35-305 of ANR's "I-Rule"[20] within six months of the closing. Exh. PUC-2 (MOU ¶ 5.d.(3)).

99. NorthStar is obligated to complete the comprehensive site investigation and any required corrective actions in accordance with the I-Rule and pursuant to a schedule developed in consultation with the Town of Vernon and approved by ANR. The MOU requires NorthStar to complete any required corrective actions to address releases of non-radiological hazardous materials in accordance with the I-Rule. Exh. PUC-2 (MOU ¶ 5.d.).

Standards for Site Restoration and Remediation

100. As more fully detailed in the MOU, the MOU requires NorthStar, among other things:

a. to remove all above-ground structures at the VY Station site other than the ISFSI and associated security facilities,[21] the VELCO switchyard, the administrative office building known as the plant support building, and a portion of the railroad spur;

b. to remove all underground structures at the VY Station site—including, without limitation, building foundations, buried piping, and contained piping—to a depth of four feet below ground surface, except for certain structures, material, and substances that are to be removed to a greater depth or entirely regardless of depth;

c. to ensure the stability of the ground above by filling "pipes and other spaces with void space that are four feet below ground surface and allowed to be left in place" with concrete or other material as necessary;

d. to fill all subsurface voids with fill material that meets conditions specified in the MOU;

e. not to use concrete or other materials from buildings or structures on the VY Station site as fill at the VY Station site, except that concrete from the VY Station cooling tower structures and intake structure may be used as fill under certain conditions;

[20]Investigation and Remediation of Contaminated Properties Rule, dated July 27, 2017.

[21] For purposes of this Order, the Commission assumes that this exception relates only to the period prior to the removal of spent nuclear fuel from the ISFSI area by the DOE and does not affect NorthStar's plans to remove any remaining ISFSI structures and associated security facilities and to restore the ISFSI area after the spent nuclear fuel is removed from the ISFSI area by DOE. *See* finding 61, above; State pf. at 43-44.

f. not to reuse at the VY Station site surface and sub-surface soil excavated as part of demolition except to the extent certain conditions are met; and

g. to regrade and reseed the land.

Exh. PUC-2 (MOU ¶ 5.b., e., f., and g.).

101. The MOU requires NorthStar to remediate the VY Station site to compliance with the residential standard values identified in Appendix A of the I-Rule, except as to any operable unit of the VY Station site for which NorthStar submits and ANR approves an institutional control plan. Exh. PUC-2 (MOU ¶ 5.e.).

102. The MOU provides that NorthStar will decommission, release, and restore the VY Station site: (1) while complying with the Vermont Radiological Health Rule, including meeting the requirements for "unrestricted areas" as that term is defined in Vermont Department of Health Rules 5-301 and 5-302(42); (2) to a radiological dose limit of 15 mrem/year from all pathways combined and with no more than 5 mrem/year from liquid effluents; and (3) for "unrestricted use," as that term is used in 10 C.F.R. § 20.1402, and not under "restricted conditions," as that term is used in 10 C.F.R. § 20.1403. NorthStar shall attempt to attain a calculated annual 10mR TEDE All Pathways and 4mR TEDE Water residual radiation standard, but attainment of this standard will not be required if, in NorthStar's sole discretion, it is cost prohibitive or technically not feasible because of site conditions. Exh. PUC-2 (MOU ¶ 5.c.).

103. Upon completion of decommissioning and site restoration of the VY Station site, NorthStar shall provide to ANR, the Vermont Department of Health ("VDH"), and the Town of Vernon a comprehensive survey and site plan identifying the location and depth of all below-grade structures remaining at the site and confirming that every remaining subsurface structure meets the release criteria described in the MOU. NorthStar is required to record the comprehensive survey and site plan in the land records of the Town of Vernon and erect field monumentation on the VY Station site to provide notice of all remaining below-grade structures in a manner that does not impede future use of the site. Exh. PUC-2 (MOU ¶ 5.g.(2)).

104. NorthStar will perform and pay for any on-site radiological monitoring analyses and all final survey status analyses required by the NRC. It will provide the results of the monitoring analyses and copies of any submissions to the NRC regarding the final status survey analysis to ANR, DPS, and VDH. Exh. PUC-2 (MOU ¶ 5.h.).

105. NorthStar will perform biannual radiological monitoring of groundwater for three years based on a post-completion monitoring plan that the NRC, VDH, and ANR will approve. Exh. PUC-2 (MOU ¶ 5.i.).

106. NorthStar agrees to perform regular and appropriate off-site radiological surveys, consistent with industry-standard practices. Exh. PUC-2 (MOU ¶ 5.j.).

107. NorthStar will work cooperatively with ANR and VDH to develop appropriate protocols related to non-radiological remediation and site restoration for information sharing, for obtaining samples from on-site environmental media, and for conducting site visits and inspections, site characterization, remediation, site restoration, and notifications. These protocols must be acceptable to ANR and VDH and be publicly available and shall recognize that ANR and VDH must approve all work plans and testing protocols prior to implementation and retain authority over all determinations of compliance related to non-radiological site characterization and remediation, non-radiological site closure, and site restoration. NorthStar agrees to provide VDH with copies of all decommissioning radiological surveys and radiochemical analysis data provided to the NRC or maintained on site as required by NRC regulations. ANR and VDH shall have the right to obtain confirmatory measurements and sampling throughout decommissioning and site restoration, provided that this does not interfere with NorthStar's schedule. ANR and VDH agree to work expeditiously with NorthStar beginning immediately upon issuance of an Order by the PUC approving the terms and conditions of the MOU "to develop and review the workplans necessary to facilitate NorthStar pre- and post-closing site restoration activities at the VY Station site." Exh. PUC-2 (MOU ¶ 5.k.).

G. Monitoring and Oversight of NorthStar and Project

108. NorthStar will provide to the DPS, ANR, and the Vermont Attorney General's Office monthly summaries of all expenditures at the site. Those agencies will be permitted access to and will have the right to inspect those expenditures and the books of NorthStar Group Holdings, LLC, NorthStar Group Services, Inc., and NorthStar VY at all reasonable times and at reasonable intervals. Exh. PUC-2 (MOU ¶ 2(f)).

109. As more fully detailed in the MOU, NorthStar will notify the DPS, ANR, and the Vermont Attorney General's Office within seven days of the following events: (a) all significant changes to the ability of NorthStar Group Service, Inc. to fund the support agreement; (b) every draw on the support agreement; (c) any event during the conduct of decommissioning, spent fuel management, or site restoration activities that could, individually or cumulatively with other events, have an adverse financial consequence of greater than $2 million; (d) any proposed change in the organization or equity ownership of NorthStar Group Holdings, LLC, NorthStar Group Services, Inc., or NorthStar VY; and (e) any breach of debt covenants, default, acceleration, insolvency, reorganization, bankruptcy, or liquidation of NorthStar Group Holdings, LLC, NorthStar Group Services, Inc., or NorthStar VY. Exh. PUC-2 (MOU ¶ 2(g)).

110. As more fully detailed in the MOU, NorthStar will provide the DPS, ANR, VDH, and the Vermont Attorney General's Office with an annual public certification that includes: (a) a detailed description of all work completed pursuant to corrective action plans approved by ANR; (b) a detailed description and schedule of remaining corrective actions and site restoration work; (c) the amount of available funds remaining for site restoration; and (d) the amount of funds estimated to be required to complete site restoration. Exh. PUC-2 (MOU ¶ 2(h)).

111. As more fully detailed in the MOU, NorthStar will provide to the DPS on an annual basis: (a) audited financial statements for NorthStar; (b) audited statements of the NDT and the SRT fund balances and an accounting of all disbursements from these accounts; (c) a schedule of both cumulative historic and projected fund activity for the NDT and SRT funds, including a breakdown of all future decommissioning, site restoration, and spent fuel management activities, an updated "pay item disbursement schedule," and the equivalent of an update of the current "deal model"; and (d) a variance analysis, comparing actual disbursements detailed in the updated "deal model" to estimated disbursements in the prior year's reporting, explaining all variances in excess of 10% or $2 million. Exh. PUC-2 (MOU ¶ 2(i)).

112. The DPS, ANR, and VDH may retain advisors pursuant to 30 V.S.A. §§ 20 and 21 and applicable State contracting procedures in support of the review processes established in the MOU. Exh. PUC-2 (MOU ¶ 10); Winn supp. pf. (5/4/18) at 3.

113. The DPS, ANR, and VDH will have regular access to the Vermont Yankee site, and NorthStar VY will remain bound by an existing memorandum of understanding related to site access. Winn supp. pf. (5/4/18) at 4; tr. 5/10/18 at 132 (Schwer); tr. 5/11/18 at 60 (State).

114. The DPS, ANR, VDH, and the Vermont Attorney General's Office will coordinate their monitoring and oversight activities, including a process to coordinate the review of information and other materials submitted by NorthStar, to oversee the work performed by NorthStar, and to consult as necessary to make any required determinations. The Department and the other State agencies will develop and implement an appropriate management plan to direct the coordination of their efforts in the oversight process. Tr. 5/10/18 at 129-131 (Schwer) and 145-146, 171-174, 181-183 (Winn).[22]

H. <u>Other Findings</u>

115. The DECON decommissioning approach provides greater certainty and less risk, both technically and financially, than the delayed SAFSTOR decommissioning approach, which presents the potential for reduced costs and greater financial growth but with greater uncertainty and more risk. Exh. DPS-WKB/GAM-2 at 5.

116. Considering the overall balance of advantages and disadvantages of the two decommissioning approaches, the greater certainty (reduced risk) associated with the DECON approach leads to a general conclusion that, if funding is available or can be ensured at reasonable expense, a DECON approach is more desirable. Brewer pf. at 4; exh. DPS-WKB/GAM-2 at 6.

117. The discovery of previously unknown or unidentified contamination, both radiological and hazardous non-radiological and other conditions, can lead to unexpected costs and delays in planned work activities. Exh. DPS-WKB/GAM-2 at 11; Arnold Gundersen for NEC ("Gundersen") pf. reb. at 14.

118. The condition of a site to be decommissioned is an essential input in evaluating the work that will be required and the cost of that work. The conditions of interest include the levels, types, extent, and location of contamination, both radiological and non-radiological, as well as presence of subsurface material or structures. The more thorough, detailed, and current

[22] *See also* Brief and Proposed Findings of ANR (6/11/18) at 5-6.

the site characterization work is, the less uncertainty there will be in the scope of work needed to fully remediate the site and hence the less risk there will be of unanticipated costs. Exh. DPS-WKB/GAM-2 at 12.

119. No matter the extent of the characterization performed, site conditions are never known with absolute precision, in part because some conditions, including levels of contamination in some structures, equipment, or soils, are not possible to discern until the dismantlement work is underway. Uncertainty in the site conditions means that there are potential unexpected changes in the scope of work that result in unanticipated costs. The unanticipated changes and costs can range from relatively small to extremely large. Exh. DPS-WKB/GAM-2 at 12, 14-15.

120. NorthStar's commitments in the MOU regarding site characterization and site restoration standards and processes reduce uncertainties and risks in the project plan. Earlier identification of unknown or unexpected plant conditions will facilitate the integration of any necessary remediation work with other decommissioning and site restoration activities and allow for earlier and more accurate scoping of work and project management to anticipate funding needs and manage project expenditures. Brewer supp pf. (3/9/18) at 3; Winn supp. pf. (3/9/18) at 3-4.

121. The financial assurance-related commitments made in the MOU provide meaningful risk mitigation and significant additional funds that will be available for the project. In addition, the reliability of the additional funding has been enhanced. These enhancements are not available under the status quo. Dane supp. pf. (3/9/18) at 10.

122. Given the uncertainty inherent in any major nuclear decommissioning and site restoration project, financial risks related to cost overruns and NorthStar's financial capacity to fund them will remain. Dane supp. pf. (3/9/18) at 10; Winn supp. pf. (5/4/18) at 13.

123. Under the MOU, NorthStar will retain a cultural expert to develop a cultural resource plan, in consultation with Elnu Abenaki and the Abenaki Nation of Missisquoi. Exh. PUC-2 (MOU ¶ 7).

124. NorthStar has committed to collaborate with stakeholders to establish an appropriate public engagement process regarding the decommissioning and restoration of the VY Station site, including exploration of forming a subcommittee of the existing Nuclear Decommissioning

Citizens Advisory Panel for this purpose. Exh. PUC-2 (MOU ¶ 8); State pf. at 45; tr. 5/11/18 at 53-56 (State).

125. NorthStar will continue to cooperate with the Nuclear Decommissioning Citizens Advisory Panel and to work with local citizens and government throughout the project and when considering site reuse. State pf. at 45; exh. PUC-2 (MOU ¶ 8).

126. The Department is satisfied that NorthStar will be a fair partner to the State. In particular, the Department was impressed by the time and effort that NorthStar put forward over the course of the negotiations that resulted in the MOU. NorthStar showed a willingness to listen to and account for the concerns of both the State agencies involved in those negotiations and the intervenor parties. By committing fully to a collaborative and open process, NorthStar demonstrated its willingness and ability to serve as a fair partner to the State going forward. Winn supp. pf. (3/9/18) at 7; Robert Spencer for the Town of Vernon ("Spencer") supp. pf. (3/9/18) at 3.

127. The proposed transaction will not interfere with the orderly development of the region. By removing most of the structures on the VY Station site other than the ISFSI and switchyard portions of the site on an accelerated schedule, the project could enhance the region's orderly development by making most of the site available for reuse sooner than originally envisioned and could further the objectives of the Vernon Town Plan and the Windham Regional Plan. Winn pf. at 14; Harry Dodson for the Joint Petitioners ("Dodson") pf. at 5-8; Susan Tierney for the Joint Petitioners pf. at 18-23.[23]

128. The proposed transaction will not have an adverse effect on aesthetics or historic sites.[24] The removal of most buildings and structures and restoration of the site could result in a significant improvement to the visual quality of the site. Winn pf. at 15; Dodson pf. at 8-10; Exh. JP-HLD-5 at 13; Exh. JP-HLD-6 at 5-6.

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[23] *See also* Brief of Windham Regional Commission (6/11/18) at 1:

> The WRC has long advocated for prompt decommissioning and site restoration to Vermont standards upon the cessation of operations and closure of the Vermont Yankee Nuclear Power Station. After years of analysis of information presented in this and prior dockets, it is our determination that these positions are in the best interest of the orderly development of the region.

[24] *See also* comments of the Vermont Division for Historic Preservation filed 10/19/17 that were submitted to the Commission.

129. NorthStar's proposed accelerated decommissioning and site restoration schedule is likely to provide economic benefits to the State of Vermont and to the Windham County region as compared with the SAFSTOR status quo and a decommissioning process commencing in 2053. Berkman pf. 3-4; exh. JP-MPB-2 at 7-9 and 33; Winn pf. at 14-15 and supp. pf. (3/9/18) at 7.

VII. DISCUSSION AND CONCLUSIONS

The most significant consequences of the proposals before the Commission in this case involve: (1) the acceleration by more than 30 years of the current schedule for decommissioning the VY Station and restoring most of the VY Station site; and (2) the transfer of the ownership and responsibility for decommissioning and site restoration from Entergy to NorthStar, a national provider of large-scale demolition and abatement services.

Early decommissioning and site restoration have broad support among the parties, government officials, and the public, and there is substantial evidence in the record about the benefits of commencing and completing this process on the schedule proposed by NorthStar.[25] The evidence establishes that early decommissioning and site restoration are preferable to the current SAFSTOR plan provided that adequate funding is available to complete the process successfully.[26]

As proposed, NorthStar VY (the renamed ENVY) will own the VY Station, and NorthStar NDC will replace ENOI as the co-holder of the CPG to own and operate the VY Station. NorthStar's assumption of ownership of the VY Station and of responsibility for decommissioning and site restoration requires an assessment of NorthStar and its plans to complete decommissioning and site restoration at the VY Station. This assessment involves, among other things, evaluations of NorthStar's financial strength and resources, its technical and managerial competence, and its reputation. Given circumstances specific to the VY Station, the Commission needs to consider the extent to which NorthStar VY will have adequate funding and financial resources to successfully complete the decommissioning and site restoration process, whether NorthStar and the team it has assembled have the technical skills, expertise, and

[25] *See* findings 115, 116, 120, 127, 128. above.

[26] *See* finding 116, above.

experience to manage and conduct required decommissioning and site restoration activities, and whether NorthStar has demonstrated that it will be a fair partner for Vermont.[27]

The principal areas of significant disagreement among the parties relate to the adequacy of the funding and financial resources available to NorthStar if the actual costs of decommissioning and site restoration were to significantly exceed NorthStar's current cost estimates.[28] The resolution of these questions is central to assessing the likelihood that Vermont will realize the benefits of accelerated decommissioning and site restoration and the suitability of NorthStar as the owner and operator of the VY Station.

Decommissioning a nuclear power plant and restoring the site inevitably involve uncertainty and risk regardless of the approach chosen.[29] The actual costs of decommissioning and site restoration can significantly exceed estimated costs depending, among other things, on the extent, location, and spread of radiological and non-radiological contaminants. Early site characterization efforts, increasing the amount of available funds and financial support for the project, and other risk-mitigation measures can reduce uncertainties and risks to successful project completion.

Parties to the MOU argue that, after taking into account the MOU, the available financial assurances will either "ensure that NorthStar completes the project on time and with full protection of the environment"[30] or "help ensure that necessary funding remains in place throughout the course of [NRC] license termination and site restoration of VY Station."[31] CLF, on the other hand, maintains that the provided financial assurances are not adequate to protect against risks related to known and unknown sources of contamination at the site.

In the Commission's view, the MOU provides additional financial assurances and other provisions that reduce or have the potential to reduce the risks and uncertainties related to the

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[27] The Commission's determinations with respect to these criteria are discussed in separate sections below.

[28] Following the filing of the MOU, no party has raised significant issues concerning the technical or managerial competence of NorthStar's decommissioning and site restoration team or whether NorthStar will be a fair partner for Vermont.

[29] *See* findings 115 to 119, above.

[30] Initial Brief of Joint Petitioners (6/11/18) at 2 and 9.

[31] Department's Proposed Findings and Initial Brief (6/11/18) at 42; *see also* Winn supp. pf. (3/9/18) at 3-4; Schwer supp. pf. (5/4/18) at 11; tr. 5/10/18 at 131 and 133-134 (Schwer) and at 140 (Winn).

adequacy of the funding and other financial resources committed to the project. We take specific note of the enhanced financial assurances related to site restoration and the various provisions of the MOU designed to reduce uncertainties and risk by setting forth requirements for non-radiological site characterization, informational reporting, and oversight by State agencies.

We must also take into account the decision of the NRC to approve the transfer of the NRC licenses to NorthStar. The NRC has responsibility for overseeing radiological decommissioning and has specialized knowledge, experience, and expertise regarding the decommissioning of nuclear power plants. The NRC found NorthStar to be both technically and financially qualified to hold the licenses and specifically concluded that NorthStar had provided reasonable assurance of obtaining the funds necessary to cover the estimated costs of decommissioning the VY Station and the ISFSI and of spent fuel management in accordance with applicable NRC requirements.

Despite NRC approval and the additional assurances provided by the MOU, risks related to the adequacy of available funding remain. As acknowledged in the Department's testimony, the additional financial assurances provided in the MOU reduce but do not eliminate risks related to the adequacy of financial support for the project, and "approval of this transaction under the terms memorialized in the MOU represents a balancing of interests"[32]

We therefore remain faced with a situation in which the benefits of the proposed transfer must be balanced against the uncertainty and risk that remain after accounting for the additional financial assurances and contingent resources provided for in the MOU. As the parties to the MOU point out, our consideration must also include the status quo, which also involves substantial uncertainties and risks. Under Entergy's current schedule for delayed decommissioning and site restoration, these uncertainties and risks would fall on a future generation that realized no benefits from electricity generated by Vermont Yankee.[33] In

[32] Winn supp. pf. (3/9/18) at 7-8; Dane supp. pf. (3/9/18) at 10.

[33] The importance of this consideration to the State may be inferred from 30 V.S.A. § 2(d). Although not directly relevant to the Commission's responsibilities in this case, this statute would seem to indicate a State policy preference to not place the burden of decommissioning and site restoration uncertainties and risks on "the state's future consumers who never obtain benefits from [the VY Station]." The statute specifically provides as follows:

> In any proceeding where the decommissioning fund for the Vermont Yankee Nuclear Facility is involved, the Department shall represent the consuming public in a manner that acknowledges that the general public interest requires that the consuming public, rather than either the State's future

addition, significant financial assurances and risk-mitigation measures provided for in the MOU are not available under the status quo.

For these and other reasons discussed more fully below, we conclude, on balance and subject to the MOU, that the proposals now before the Commission in this case will promote the public and general good of the State of Vermont and, accordingly, we have determined to provide the requested approvals and consents.

A. Available Funds and Assurances; Financial Resources

Upon the acquisition by NorthStar of an Entergy subsidiary, NorthStar will own the VY Station, the spent nuclear fuel stored on the site, the site property, and all the assets in the nuclear decommissioning trust (NDT), including the site restoration trust (SRT) sub-account. NorthStar generally anticipates that the trust funds and claim recoveries from the U.S. Department of Energy (DOE) will be adequate to cover the costs of all decommissioning, site restoration, and spent fuel management activities.

As noted above, the MOU provides significant additional financial assurances to support site restoration activities at the VY Station. These financial assurances significantly increase the likelihood that adequate funds will be available for site restoration as compared both with the original proposals of the Joint Petitioners and the existing commitments of Entergy related to site restoration. NorthStar estimates that the total site restoration costs of the project will be about $25.3 million.[34] Pursuant to the MOU, Entergy will contribute additional funds to the site restoration trust to increase the balance of that trust account to $60 million at the closing of the acquisition. Distributions from the SRT sub-account are to be used exclusively to pay site restoration costs, and the Department will have the right to object to certain proposed disbursements from the sub-account.

In addition, the MOU requires NorthStar to contribute $30 million at closing to a newly established escrow account and to make additional deposits of $25 million over a period of

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> consumers who never obtain benefits from the facility or the State's taxpayers, ought to provide for all costs of decommissioning. The Department shall seek to have the decommissioning fund be based on all reasonably expected costs.

30 V.S.A. § 2(d).

[34] State supp. pf. (3/10/17) at 4; finding 62, above.

several years. Withdrawals from this escrow account may be made only with approval from the Department and ANR. The MOU's only restriction on their exercise of these approval rights is in the case of a reasonable withdrawal request for the purpose of site restoration.[35] NorthStar must also obtain a $30 million pollution legal liability insurance policy that provides coverage for previously unknown or not fully characterized non-radiological environmental conditions at the VY Station site.[36] The MOU also clarifies that the $140 million parental support agreement to be provided by NorthStar Group Services, Inc. will be available to fund site restoration requirements and gives the Commission authority to order NorthStar Group Services to provide funding under the support agreement when supported by a reasonable determination by the Department and ANR of a need for additional site restoration work.[37]

NorthStar's ability to complete site restoration successfully depends not only on the financial resources available for site restoration but also on the adequacy of the total amount of funds available for the project, including the funding sources dedicated to radiological decommissioning and spent nuclear fuel management. Although Vermont has a strong interest in the adequacy of funds available for the entire project, the responsibility for oversight of radiological decommissioning and spent fuel management rests principally with the NRC, which has substantial expertise and experience related to assessing the adequacy of funding and overseeing the decommissioning process.

In approving the transfer of the NRC licenses from Entergy to NorthStar, the NRC found NorthStar to be both technically and financially qualified under applicable requirements. The NRC also determined, based on an independent cash flow analysis, that NorthStar had provided reasonable assurance of obtaining the funds necessary to cover the estimated costs of decommissioning the VY Station and the ISFSI and of spent fuel management in accordance with applicable NRC requirements.

The NRC's conclusions regarding the funding available for decommissioning and spent fuel management deserve substantial deference given the NRC's expertise and experience and its

[35] Exh. PUC-2 (MOU ¶ 2.c.(1)); finding 85, above.

[36] Exh. PUC-2 (MOU ¶ 2.e); findings 87 to 89, above. *See also* discussion below regarding a review of the final forms of the pollution legal liability insurance policy and the escrow account documents.

[37] Exh. PUC-2 (MOU 2.b.(1)); finding 82, above.

ultimate responsibility for overseeing radiological decommissioning, spent fuel management, and NRC license termination. However, the NRC order and conclusions do not ensure that adequate funding will be available under all contingencies -- for example, in the event of large cost overruns for significant unexpected work related to radiological contamination at the site.

In such an eventuality, NorthStar VY will depend in large part on the $140 million support agreement to be provided by NorthStar Group Services, Inc. to cover such cost overruns. Even after last year's recapitalization of NorthStar and the availability of a revolving credit line, there remain questions, based on testimony by Department witnesses, about the ability of NorthStar Group Services, Inc. to fund the full amount of the support agreement if needed.[38]

Although uncertainties and risks remain, we rely in our determinations not only on the NRC expert conclusions but also on other considerations we find relevant to reducing risks associated with the adequacy of financial resources. These include:

- The entire package of financial assurances from a variety of sources provided for in the MOU, including the commitment by NorthStar not to withdraw funds from the NDT for any task in an amount exceeding that specified for the task in the pay-item disbursement schedule;
- The provisions in the MOU, which with appropriate oversight by State agencies should enable significant problems to be identified and addressed soon after they arise; and
- The commitment of NorthStar to a business model and strategy that depend on the success of its decommissioning and site restoration work at the VY Station and incentives inherent in the business structure of the proposed plans for decommissioning and site restoration.[39]

In addition to the financial assurances provided in the MOU, the MOU contains numerous other provisions that reduce potential uncertainties and risks related to the project. Among other things, NorthStar commits to submit, no later than six months after the closing, a

[38] *See* Dane sur. pf. (12/1/17) at 3, 6-8 and supp. pf. (3/9/18) at 9; Winn supp. pf. (3/9/18) at 6; tr. 5/11/18 at 73-75 (Dane) and tr. 5/10/18 at 149-150 (Winn).

[39] NorthStar's interest in taking on the decommissioning of the VY Station is part of a business opportunity identified by NorthStar related to the decommissioning of nuclear power plants in the United States. Given J.F. Lehman & Co.'s investments in NorthStar and its acquisition of Waste Control Specialists, LLC., it appears that NorthStar's principal owner is supportive of NorthStar's business strategy with respect to the decommissioning of nuclear power plants. Tr. 5/11/18 at 35-36 (State).

site investigation report pursuant to ANR's I-Rule for each operable unit of the site where site investigation activities do not create an actual conflict with the Atomic Energy Act.[40] The MOU provides for the following: a plan to perform groundwater sampling of non-radiological contamination; a plan to characterize below-ground structures that NorthStar plans to leave in place; a plan for any use of concrete fill; a detailed description of how concrete material will be processed and managed on site; identification of the specific locations where concrete will be managed and used as fill; a plan for any use of off-site materials as fill; and a schedule for the completion of site investigation activities.

Furthermore, NorthStar agrees in the MOU to work cooperatively with ANR and VDH to develop appropriate protocols related to non-radiological remediation and site restoration, for information sharing and notifications, for obtaining samples from on-site environmental media, and for conducting site visits and inspections, site characterization, remediation, and site restoration. NorthStar will complete the comprehensive site investigation and any required corrective actions in accordance with the I-Rule and pursuant to a schedule developed in consultation with the Town of Vernon and approved by ANR.

We emphasize the importance of the post-closing oversight activities by the relevant State agencies in mitigating risks to the State related to funding adequacy. In addition to other measures that have the potential to mitigate post-closing risks, NorthStar will be providing monthly summaries of all expenditures at the site, informative and detailed annual certifications regarding the project's progress, and prompt notification of material developments affecting NorthStar or the project. The State agencies will also have significant rights in overseeing the project, including the right to inspect books and records, to access the site, and to object to disbursements from certain funding sources. Given the importance of project oversight by the State agencies, we trust that the State agencies will retain appropriate resources, devote the necessary time and attention, and constructively manage and coordinate their efforts to ensure that the available tools are effectively used in accordance with the interests of Vermont.

Among other things, the protections afforded by the MOU should allow for early identification of issues and, if necessary, reassessment of plans and schedules before available

[40] Exh. PUC-2 (MOU ¶ 2.d.(3)); finding 98, above.

funds and resources are substantially reduced and reasonable alternatives become more limited. In the worst case, it might be necessary to reassess plans, schedules, and budgets and explore, depending on circumstances, the possibility of a SAFSTOR option.[41]

To ensure appropriate legal documentation for certain financial assurances in the MOU, this Order will be conditioned on the receipt of notification, prior to the transfer of ownership, from the Department that the Department is satisfied, based on a review of the final form of insurance and escrow documents, that the pollution legal liability insurance policy and escrow account provided for in paragraph 2. c. of the MOU will meet the requirements of the MOU and, to the extent reasonably possible, will protect the interests of the State of Vermont in the event of an insolvency or bankruptcy event involving NorthStar.

CLF asserts that the Commission should either deny the petition or impose additional financial assurance requirements. We note that the parties to the MOU spent several months discussing and negotiating various assurances and other issues before reaching agreement on the MOU. Although the imposition of additional financial assurance requirements would further reduce risks associated with the proposed transaction, it might also jeopardize the proposed transaction.[42] Based on the MOU, we are satisfied that the benefits of the proposed transaction when balanced against the remaining risks are enough to reach a conclusion that the proposed transaction will promote the public good. We discuss and address the specific arguments of CLF in section VII. G., below.

B. Technical and Managerial Competence

As a national provider of demolition services, NorthStar has substantial management and technical experience and expertise in the decommissioning of large structures, including energy facilities. Its decommissioning work has involved activities related to the investigation, management, abatement, remediation, and disposal of hazardous contaminants such as asbestos, lead paint, and PCBs. It has worked on several nuclear facility decommissioning projects involving research reactors at universities and DOE facilities. However, NorthStar has never been involved in the decommissioning of a commercial nuclear power plant.

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[41] Tr. 5/10/18 at 162-163 (Winn); Winn supp. pf. (5/4/18) at 8; tr. Brewer 5/10/18 at 118-119 (Brewer).

[42] *See* Spencer supp. pf. (3/9/18) at 3.

Questions were initially raised by parties to this case and members of the public about whether NorthStar had the necessary expertise and experience to decommission the VY Station because NorthStar has never taken the lead on a nuclear decommissioning project or on a project of the scale and complexity of the decommissioning of the VY Station.

During this proceeding, witnesses for non-petitioning parties who had expressed concerns about NorthStar's lack of experience in managing the decommissioning of commercial nuclear reactors expressed increased confidence in NorthStar's ability to successfully complete the project. This increased confidence was based on increasing familiarity with NorthStar's plans for decommissioning and site restoration, its project management team, and the relevant expertise and experience of its team of sub-contractors.

NorthStar will contract with Orano to perform work related to the decommissioning of the reactor vessel and vessel internals, which will require the segmentation of the reactor vessel. This work is one of the primary challenges related to decommissioning a commercial nuclear power plant, and Orano has specific experience in the segmentation of a boiling water reactor similar in type and size to the one at the VY Station. Orano also has substantial experience in the management of spent nuclear fuel, and Orano will manage spent nuclear fuel at the VY Station. The evidence supports the conclusion that Orano is well suited to perform the contracted activities related to the segmentation of the nuclear reactor and the long-term management of spent nuclear fuel at the VY Station site.

NorthStar will also engage Waste Control Specialists, LLC (WCS), which operates a low-level radioactive waste disposal site in Texas. It will be involved in the on-site processing, packaging, loading, and off-site disposal of low-level waste. As the operator of the only facility capable of handling each of the categories of low-level radioactive waste, WCS provides necessary technical capabilities and a useful synergy given that the facility includes the disposal site that is subject to a compact between Texas and Vermont on the disposal of low-level radioactive waste.

ANR observes that NorthStar has experience related to the non-radiological contaminants that are likely to be encountered at the VY Station site. ANR concludes that NorthStar and its subcontractors have the experience and expertise to conduct the required non-radiological activities at the VY Station site in connection with the restoration of the site. The Department's

testimony also acknowledged the experience and expertise of NorthStar and its subcontractors. Prior to the MOU, the Department indicated that NorthStar has obtained or will obtain the managerial and technical resources and personnel with relevant expertise in the technical and managerial aspects of a commercial reactor decommissioning project.[43] The NRC also concluded that the proposed NorthStar "management and technical support organization" and "onsite organization" will adequately support the proposed maintenance and decommissioning activities at the VY Station.[44] The record contains no significant evidence that challenges the technical and managerial qualifications of NorthStar and its subcontractors to perform spent nuclear fuel management, decommissioning, and site restoration activities at the VY Station. Based on the evidence, we conclude that NorthStar will have the necessary managerial and technical expertise to complete the project.

C. Fair Partner

There is no evidence in the record that indicates a concern with NorthStar's history of regulatory compliance in any jurisdiction. Although NorthStar does not have prior experience in Vermont, other parties to the MOU have credited NorthStar for its willingness to engage with the parties to this case, other stakeholders, and the public and for its efforts in negotiating and reaching agreement on the MOU while maintaining the civil tenor of discussions.[45] As the Department stated in its brief:

> NorthStar's conduct during this proceeding—specifically, its willingness to engage in thoughtful discussions and negotiations and reach compromise on the MOU—supports a finding pursuant to that standard that NorthStar will operate as a fair partner to the State of Vermont. *See* Winn [supp. pf. (3/9/18) at 7]. NorthStar actively participated in numerous meetings (both public and directly with parties and intervenors) to hear and respond to concerns. . . . NorthStar's responsiveness to those concerns, both during MOU negotiations and through future commitments, demonstrates a dedication to serve as a fair partner to the State.[46]

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[43] Winn sur. pf. (12/1/17) at 2.

[44] Exh. JP-SES-25 at 22-23.

[45] Spencer supp. pf. (3/9/18) at 3; Winn supp. pf. (3/9/18) at 7; DPS Proposed Findings and Initial Brief (6/11/18) at 26 to 28; ANR Brief and Proposed Findings (6/11/18) at 18 to 20; Windham Regional Commission Brief (6/11/18) at 1; Proposed Findings and Conclusions of NEC (6/11/18) at 1.

[46] DPS Proposed Findings and Initial Brief (6/11/18) at 26. *See also* finding 126, above.

The MOU parties also point to provisions in the MOU that evidence a continued commitment by NorthStar to a collaborative process of consultation and public engagement. These commitments include: coordination of site investigation, corrective action, and other work with State agencies; further collaboration with stakeholders to establish an appropriate public engagement process regarding decommissioning and site restoration; consultations with the Town of Vernon regarding site restoration to provide for future use of the site in a manner consistent with the Vernon Town Plan; and the retention of a cultural expert to develop a cultural resource plan in consultation with the Elnu Abenaki and the Abenaki Nation of Missisquoi.

Based on the foregoing considerations, we conclude that NorthStar has adequately demonstrated that it will be a fair partner for Vermont in the decommissioning and site restoration process and, generally, in its ownership and operation of the VY Station.

D. Site Restoration Standards

The MOU in Docket 7862 deferred the resolution of site restoration standards, instead requiring the parties to work in good faith to establish standards at a later date. Paragraph 5 of the MOU in this case resolves those standards, specifying a detailed process and timeline by which NorthStar will develop and execute a plan for site characterization of the VY Station site and the site restoration standards to which NorthStar will return the VY Station site.[47]

Except for CLF, all State, regional, and local parties, including the Town of Vernon Planning and Economic Development Commission, the Windham Regional Commission, and NEC, have agreed to the site restoration standards in the MOU. Although CLF did not sign the MOU, CLF has not objected to the site restoration standards on any substantive ground.

The site restoration standards in the MOU benefit State and local interests. At the State level, the site restoration standards require NorthStar to remediate non-radiological contamination to residential standard values pursuant to ANR's I-Rule, with any departure requests approved by ANR.[48] The I-Rule governs investigations and corrective actions for properties affected by releases of hazardous materials to "protect the public health and the

[47] *See* finding 100; exh. PUC-2 (MOU ¶ 5).

[48] Finding 101.

environment."[49] The residential standard values require cleanup to residual levels of contamination that are appropriate for a residential or equivalent use.[50] If ANR permits a departure from the residential standard, NorthStar is required to implement additional measures to protect health and the environment and limit the future residential use of the property. The MOU also requires compliance with the Vermont Radiological Health Rule and its requirements for "unrestricted areas," and includes additional radiological cleanup commitments from NorthStar beyond those required by the NRC for license termination.

At the local level, the MOU requires NorthStar to work closely with the Town of Vernon on issues related to non-radiological contamination, both in developing its plan for corrective actions and in ensuring that any requested departures from the residential standard of the I-Rule are consistent with the Vernon town plan. The MOU also includes detailed requirements for the removal of above- and below-ground structures, the use of on-site and off-site materials as fill on the VY Station site, and the final regrading and reseeding of the site. The Town of Vernon was an active participant in developing the terms of the MOU and is satisfied that the final restoration of the site will be consistent with the Vernon town plan.[51]

In light of the efforts of the parties in developing site restoration standards, the compliance with State and local requirements, and the lack of objections to the substantive requirements, we are satisfied that the site restoration standards contained in the MOU are adequate to protect the interests of Vermont.

E. Note Issuance by NorthStar VY

Entergy incurred significant costs to construct the second ISFSI pad and to transfer spent nuclear fuel from the spent fuel pool to that pad. The expenses incurred to construct the second ISFSI pad and transfer the spent fuel are included in the Round 3 DOE Claim.

The Joint Petitioners propose that NorthStar VY issue a new note to VYARM in the approximate amount of $145 million to cover the costs borne by Entergy for the second ISFSI

[49] *Investigation and Remediation of Contaminated Properties Rule* (eff. July 27, 2017), p. 4.

[50] Schwer supp. pf. (3/9/18) at 5-6.

[51] Spencer supp. pf. (3/9/18) at 2-3.

pad and spent fuel transfer.[52] NorthStar expects that NorthStar VY's obligations under this note will be offset by the amount of its Round 3 DOE Claim recovery related to these costs. NorthStar will not be required to repay any remaining balance on the note that exceeds the amount of proceeds recovered from the DOE until after NorthStar's completion of planned decommissioning and site restoration activities except for the ISFSI area. NorthStar VY will also deposit into an escrow account the first $40 million of Round 3 DOE Claim proceeds until the conditions specified in paragraph 3.c. of the MOU are satisfied. These proceeds will be retained in the escrow account and used, if needed, to cover decommissioning and site restoration costs. The proceeds will not be paid to VYARM until the applicable conditions are met, including requirements related to the adequacy of funding in the nuclear decommissioning trust and NorthStar's compliance, as determined by ANR, with site investigation and corrective action plans.

The proposed note issuance by NorthStar VY to VYARM appears to be substantially justified by the unreimbursed costs incurred by Entergy and the expectation that such amounts will be recovered by NorthStar VY as part of the Round 3 DOE Claim. The repayment terms of the note and the MOU provisions related to establishment of a $40 million escrow account for DOE proceeds provide substantive protections and help ensure the adequacy of the financial support that will be available for the completion of planned decommissioning and site restoration activities other than for the ISFSI area.

The MOU parties request that the Commission grant consent to the issuance of the proposed note to VYARM subject to the applicable provisions of the MOU. No party has specifically challenged the proposed note issuance. Based on the foregoing, we conclude that the proposed note issuance as modified by the MOU will promote the general good of the State.

F. Transfer of SRT Assets to Sub-Account of NDT

The Docket 7862 MOU provided for the establishment of a site restoration trust (SRT) solely dedicated to site restoration at the VY Station, with the State of Vermont designated as a

[52] ENVY currently has a credit facility that it used to fund the transfer of spent nuclear fuel to the ISFSI. Prior to the closing of NorthStar's acquisition of ENVY, ENVY's existing credit facility will either be assumed by an Entergy subsidiary, VYARM, or will be paid off from the proceeds of a new replacement credit facility that Entergy will enter into through VYARM.

material beneficiary of the trust. The Docket 7862 MOU also contemplated that site restoration would be conducted after radiological decommissioning had been completed to the satisfaction of the NRC.[53] NorthStar's decommissioning and site restoration plans and budgets rely on the concurrent conduct of decommissioning and site restoration activities.

The Joint Petitioners request that the Commission approve a transfer of the site restoration trust assets to a sub-account of the NDT because such transfer would facilitate the concurrent conduct of and payment for decommissioning and site restoration activities. The NDT trustee would serve as the trustee both for the SRT sub-account and for the rest of the NDT. Any distributions from the SRT sub-account would be used exclusively to pay for site restoration. The Department will have the same rights to object to proposed disbursements from the SRT sub-account as it currently has under the site restoration trust agreement.[54]

The MOU parties support the proposed transfer and request that the Commission amend its Order in Docket 7862[55] to allow the site restoration trust assets to be contributed into the segregated sub-account of the nuclear decommissioning trust. The MOU expressly provides that the State of Vermont will be designated as a material beneficiary of the sub-account and sets forth conditions related to disbursements of sub-account funds. Except for a procedural objection raised by CLF (which is discussed in section VII. G., below), no party challenged the transfer of SRT assets to a segregated NDT sub-account.

The evidence in the record supports the conclusion that the interests of the State are not likely to be affected by the transfer of site restoration trust assets to a sub-account of the nuclear decommissioning trust. The proposed transfer to an NDT sub-account must also be viewed in the context of the entire set of proposals, which will promote the public and general good of the State. Accordingly, we find good cause to amend our Order in Docket 7862.

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[53] Docket 7862 MOU (¶ 5). *See* Docket 7862, Order of 3/28/14 (Attachment B).

[54] Exh. PUC-2 (MOU ¶ 6); State pf. at 23-24; exh. JP-SES-2 (§ 4.01).

[55] Docket 7862, Order of 3/28/14 at 95 (¶ 3).

G. Discussion of CLF Arguments

1. Entergy's Liability for the VY Station

CLF criticizes the proposed transfer on the grounds that it will relieve the Entergy entities from their liability for decommissioning the VY Station. CLF argues that the Entergy entities are better capitalized than NorthStar and more capable of addressing any unplanned or unexpected issues that may arise during the decommissioning process.

The primary assumption underlying CLF's argument is that Entergy entities other than ENVY and ENOI (the owner, operator, and CPG holders) have or may have legal liability for decommissioning under the United States Supreme Court's decision *United States v. Bestfoods*.[56] In *Bestfoods*, the Supreme Court explained that a parent corporation may be liable for a subsidiary's actions under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("CERCLA")[57] indirectly under a traditional veil-piercing theory or directly if the parent corporation is also an operator of the subsidiary's polluting facility.[58] CLF's expert, Mr. Hill, appears to focus on the veil-piercing form of liability described in the *Bestfoods* case.[59]

The MOU is silent on the issue of liability with the exception of paragraph 16, which expressly states that the MOU has no impact on liabilities and obligations under Chapter 159 of Title 10 of the Vermont Statutes Annotated. The Joint Petitioners, the Department, and ANR all agree that the Entergy entities are not released from any liability that arises under CERCLA or 10 V.S.A. § 6615.[60] CLF has not identified any specific facts demonstrating that a release of liability will result from the transfer of ownership.

We recognize CLF's concerns related to the transfer of ownership and decommissioning responsibility from Entergy to NorthStar, as Entergy Corporation is a stronger parent company

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[56] 524 U.S. 51 (1998).

[57] 42 U.S.C. §§ 9601 *et seq.*

[58] 524 U.S. at 61-66.

[59] Hill sur. pf. (12/1/17) at 6.

[60] Reply Brief of Joint Petitioners of 6/25/18 at 8; Department Reply Brief of 6/25/18 at 3-4; ANR Reply Brief of 6/25/2018 at 1-2.

than NorthStar Group Services, Inc.[61] The issue presented in our view is not strictly one of legal liability or of the willingness of a parent corporation to support a corporate subsidiary, but rather involves the resources and ability of the parent corporation to provide necessary support to the subsidiary.[62] In weighing the risks and benefits of the transfer of ownership, we have considered the relative financial strength of the Entergy group and NorthStar (especially as it relates to NorthStar's ability to fully fund the support agreement if it becomes necessary) and have determined, particularly in light of the financial assurances and other risk-mitigation measures provided for in the MOU, that the transfer will promote the public and general good of the State.

As CLF references, in Docket 7404 the Commission denied a request by Entergy to transfer the ownership of the VY Station to a new company, Enexus. The Commission noted, as a factor in that decision, that Entergy Corporation had significantly more assets, more revenue, more income, and a more diverse revenue stream than the proposed transferee.[63]

In Docket 7404, the potential benefits of the proposed transaction were not enough to outweigh, among other things, the loss of a stronger corporate parent. In this case, NorthStar's accelerated schedule for decommissioning presents the opportunity for significant benefits to the State. In addition, the potential future liabilities associated with the VY Station no longer include the capital-intensive requirements of reliably operating and maintaining a nuclear plant.[64] Finally, we note that under Entergy's SAFSTOR decommissioning plan, the financial strength of Entergy would have become most relevant in three decades or more, and we cannot assume that it would have been the same or better than it is now.

2. Transaction Structure Provides Obligations and Incentives

CLF argues that the structure of the transfer does not create any binding obligation on NorthStar to complete the decommissioning of the VY Station within the accelerated time frame proposed. CLF further argues that NorthStar's financial assets increase the possibility of an

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[61] *See* findings 6, 26, 30, and 31, above.

[62] One minor instance of how such parental support may benefit a subsidiary through, for example, lower borrowing rates is provided by Entergy Corporation's guarantee of ENVY's credit facility that funded the transfer of spent nuclear fuel to the ISFSI. *See* finding 36, above.

[63] Docket 7404, Order of 6/24/10, at 13-16.

[64] *Id.* at 12.

untimely completion of decommissioning or even a failure to complete the decommissioning at all.

As discussed above, the funds that will be available to NorthStar following the transfer—the NDT and SRT, Entergy's contributions to the SRT, performance bonds obtained by NorthStar, the support agreement from NorthStar Group Services, Inc., the $55 million escrow account to be established by NorthStar, the pollution legal liability policy, and the escrow of the Round 3 DOE Claim proceeds—provide reasonable assurance that NorthStar will have the assets required to complete the decommissioning within the proposed time frame. It is not possible to eliminate every risk associated with decommissioning the VY Station or to structure a transfer that anticipates every development that may arise. The MOU, however, provides a structure that mitigates the potential risks of decommissioning through a combination of financial support and oversight with the ultimate goal of achieving a full decommissioning of most of the VY Station decades earlier than any presently proposed alternative.

We also disagree with CLF's argument that the transaction as structured does not provide adequate incentives for NorthStar to complete the decommissioning according to the accelerated schedule. NorthStar will be compensated according to the pay-item disbursement schedule only when the specified tasks are completed. The longer it takes NorthStar to complete the tasks, the longer NorthStar must wait to be compensated. NorthStar is obligated to provide a letter of credit in the amount of $25 million if it does not start or finish on time[65] and may not terminate the $55 million escrow account until it completes a partial release of the decommissioned and restored site. The MOU also establishes preliminary deadlines and subsequent processes for developing a schedule for site investigation and remediation work. We conclude that the financial framework of the transaction, all of which will be subject to oversight by State agencies, provides NorthStar with adequate incentives to complete the decommissioning according to the accelerated schedule that it has proposed.

3. NorthStar Must Obtain Pollution Legal Liability Insurance

CLF criticizes the MOU provisions requiring NorthStar to obtain pollution legal liability insurance for several reasons. CLF maintains that the draft pollution legal liability policy

[65] Exh. PUC-2 (MOU ¶ 2(a)(4)).

presented as evidence does not permit the Commission to adequately assess the financial assurance it will provide due to its preliminary draft status. CLF also argues that a later review of the pollution legal liability policy prior to closing is insufficient for the Commission's decision regarding whether the proposed transfer will promote the general good of the State.

Paragraph 2(e) of the MOU requires NorthStar to obtain a pollution legal liability policy in the amount of $30 million to address potential non-radiological contamination that may be discovered during the decommissioning process. The policy must remain in effect until NorthStar completes planned decommissioning and site restoration activities, except for the ISFSI area. Although the terms of the policy have not been finalized, the Joint Petitioners state that the final policy will provide that the insurer cannot unreasonably withhold consent to the assignment of the policy and that the policy will include the State of Vermont as an additional insured party.[66] Both the Joint Petitioners and the Department agree that they will work together to finalize the details of the policy such that its terms are sufficiently protective of the public good.[67] Preliminary drafts of the policy are part of the evidentiary record in this case.[68]

Given the MOU requirements and the Joint Petitioners' agreement to cooperate with the Department in finalizing the terms of the policy, we do not consider the lack of a final pollution legal liability policy at this stage—prior to our approval—to preclude a finding that the transfer will promote the general good of the State. In addition, as a condition of our Order, we require notification from the Department when it is satisfied that the terms of the pollution legal liability policy are final and comply with the requirements of the MOU, including that the final policy be reasonably assignable and include the State of Vermont as an additional insured party.

4. Confidential Treatment of Materials Does Not Preclude Approval

CLF argues that the volume of confidential material in this proceeding precludes finding that the transfer will promote the general good of the State. The basis of CLF's argument is not clear.

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[66] Initial Brief of Joint Petitioners Joined by Intervenor Elnu Abenaki Tribe of 6/11/18 at 30-31.

[67] *Id.*; Reply Brief of DPS of 6/25/18 at 6-7.

[68] *See, e.g.*, exh. CLF-MOH-8.

Before the Commission will grant a protective order, the party seeking protection bears a heavy burden to show that protection is warranted. The Commission determined that the Joint Petitioners satisfied that burden for the information protected in this case.[69] CLF did not oppose the Joint Petitioners' request or challenge the confidential treatment of the information during the proceeding, and CLF does not now allege that confidential treatment is not warranted for any specific information.

The Commission has reviewed the confidential information in this case and concludes that the confidential information does not prevent a finding that the transfer will promote the general good of the State. We further note that our decision and findings are based on publicly available information rather than any confidential material submitted in this case. State agencies with oversight responsibilities related to the transfer and subsequent decommissioning and site restoration activities have access to the confidential information if needed.

5. NorthStar's Corporate Structure

CLF criticizes the corporate structure of the NorthStar entities that will take over ownership and responsibility for the VY Station. CLF is concerned about the number and complexity of the involved entities and argues that the evidence is unclear as to how assets and obligations will be distributed among the entities. As discussed above, CLF is also concerned about the capitalization of the entities that will have obligations.

The new proposed corporate structure is no more complicated than the existing corporate structure for the Entergy entities that we approved in Docket 6545.[70] Under the current ownership structure, ENVY owns the VY Station. ENVIC holds 100% of the membership interests in ENVY. ENOI, along with ENVY, holds the CPG for the VY Station. All three entities are indirect, wholly owned subsidiaries of Entergy Corporation.[71]

After the transfer, the membership interests in ENVY that are currently held by ENVIC will be transferred to NDH. ENVY will change its name to NorthStar VY. NorthStar NDC will

[69] Order of 1/11/18.

[70] *See* simplified organization charts in Appendix C to this Order. *See also* Docket 6545, Order of 6/13/02 at 4, 11, 37-38, 158, and Appendix D.

[71] Docket 7862, Order of 3/28/14 at 27.

replace ENOI as the co-holder of the CPG and will assume ENOI's obligations. NDH and NorthStar VY are both wholly owned subsidiaries of NorthStar Group Services, Inc., a national provider of demolition and remediation services. In the post-transfer structure, NorthStar VY will own the assets, including the VY Station, its spent nuclear fuel, the NDT, the SRT, and the real property within the VY Station site. NorthStar NDC will be the licensed operator of the VY Station and will have the primary responsibility for decommissioning activities.[72]

CLF cites to Docket 7404 as an instance when the Commission rejected a proposed transfer of the VY Station because of the complex corporate structure of the acquiring entity. The basis for the Commission's decision in Docket 7404, however, was not the complexity of the corporate structure. Instead, the Commission was concerned about the financial capability of the proposed acquirer, Enexus, to operate the VY Station safely and reliably. For example, the Commission explained that:

> [w]hen it comes to the transfer of ownership of a nuclear power plant, the [Commission] regards the relative financial capability and resources of the new owner as compared with the current owner as a more important consideration than it may be in the context of other acquisitions, particularly in light of the capital-intensive requirements of reliably operating and maintaining a nuclear plant.[73]

The Commission also stated that its "concerns are heightened by the dependence of Enexus for its revenue, cash flow and income on the safe and continued reliable operation of six merchant nuclear plants, all of which are now between 34 and 39 years old, and on the still uncertain financial and economic environment," including the significant debt carried by Enexus that would require refinancing in the future.[74]

In contrast to the situation in Docket 7404, the VY Station is no longer operational. Also in contrast to Docket 7404, the transfer proposed here brings the potential for significant benefits to Vermont in the form of an accelerated cleanup of the VY Station site. For these reasons, we do not agree that NorthStar's corporate structure raises the concerns that were present in the Commission's decision in Docket 7404.

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[72] *See* findings 2-7, 25-27, 33-40, above. One additional intermediary entity, VYARM, will involved in the transfer process and will remain a wholly owned subsidiary of Entergy.

[73] Docket 7404, Order of 6/24/10, at 12.

[74] *Id.* at 15.

6. The MOU Adequately Addresses Risks

CLF's criticisms of the specific funding mechanisms provided by the MOU reiterate some of the issues we have already discussed. In particular, CLF argues that the individual financial assurances in the MOU are unreliable and inadequate to support a conclusion that the transfer to NorthStar is in the public good. CLF agrees that the new assurances added as a result of the NRC proceedings strengthen the assurances in the original MOU but maintains that serious shortcomings remain.

As we have acknowledged throughout this Order, any approach taken for the decommissioning of the VY Station will involve risk. Our review of the proposed transfer requires an assessment of whether the financial assurances proposed in the MOU sufficiently mitigate that risk when balanced against the benefits that the MOU provides. The MOU provides financial assurances from different sources that exist at different times throughout the decommissioning process. These financial assurances are in addition to the funds that will be available in the NDT and SRT and from DOE claim recoveries, which are expected to cover NorthStar's estimated costs of decommissioning, site restoration, spent fuel management, and NRC license termination. While every contingency cannot be accounted for prior to the transfer, we are satisfied that the financial assurances provided by the MOU, in combination with the NDT and SRT funds and the substantial oversight by the State agencies involved, sufficiently mitigate the risks of unforeseen developments during the decommissioning and site restoration process.

7. Risk of Bankruptcy

CLF states that "[m]onies held in an escrow account are generally not property of the estate,"[75] but then addresses circumstances in which escrowed funds would be considered a part of a bankruptcy estate. The Department explains that the final escrow agreements will be drafted to ensure that they are as protective as possible in the event of insolvency or bankruptcy of NorthStar VY or NorthStar Group Services, Inc.[76]

[75] CLF Brief of 6/11/18 at 24 (citations omitted).

[76] Reply Brief of DPS of 6/25/18 at 15-16.

While we cannot anticipate all factual scenarios that may exist in the event of a NorthStar bankruptcy, we are satisfied that the Department and the Joint Petitioners will work together to ensure that the maximum protection of the escrowed funds is in place. The substantial oversight by the State entities during the decommissioning and site restoration process provide the means for the State to identify insolvency risks at an early stage when steps might be taken to avoid it. To address some of CLF's concerns, our Order includes a condition requiring notification from the Department that the final escrow documents and pollution legal liability insurance policy meet the requirements of the MOU and provide as much protection as reasonably possible against insolvency or bankruptcy.

8. Continued Oversight of NorthStar's Compliance with MOU

CLF argues that permitting the finalization of the numerous transaction documents required by the MOU amounts to an impermissible condition subsequent. We disagree. In approving the transfer, we are not delegating our authority to determine whether the transfer will be in the public good. Instead, we are deciding that the transaction is in the public good based on the transaction structure and parameters as reflected by the evidence presented, including the MOU, understanding that the requirements will be met and all necessary documentation obtained as stated in the MOU. Any deviations from the requirements of the MOU are subject to ongoing State oversight and can be brought to our attention if necessary.

9. Modifying Prior Orders and CPGs

CLF argues that our prior orders involving the VY Station in Dockets 6545 and 7862 cannot be amended in this proceeding. According to CLF, the doctrines of issue preclusion, claim preclusion, and VRCP 60(b) prohibit amending prior orders without reopening the original docket.

We do not agree that claim preclusion or issue preclusion requires reopening our prior dockets under these circumstances. The petition that initiated this proceeding requested modification of prior orders and CPGs from Dockets 6545 and 7862 with respect to certain requirements including rubblization, separate trust accounts, and the timing of site restoration.[77]

[77] *See* Petition at 5, 6, 8-9.

The Joint Petitioners provided notice of the petition to the entire service list from Docket 7862, which was the last CPG proceeding involving the VY Station.[78] In response to the notice of this proceeding, many of the Docket 7862 parties intervened, including CLF. Many of those same parties, including CLF, attended several days of evidentiary hearings on the modifications requested in the petition and reflected in the terms of the MOU in this case.

The statutory scheme under Section 231 of Title 30 contemplates the possibility that the Commission may need to modify prior orders and CPGs to ensure that they continue to promote the general good of the State if circumstances change. Section 231 expressly grants the Commission authority to amend CPGs.[79] Although CLF's argument is limited to the amendment of orders (rather than CPGs) in this case, the argument necessarily extends to CPGs also because every CPG issues with an accompanying order. If accepted, CLF's argument would layer an additional procedural requirement on top of the Commission's statutory authority to modify CPGs for good cause. CLF's argument would also be contrary to the Commission's historical practice of amending prior orders and CPGs in new dockets, as occurred in prior dockets concerning the VY Station.[80]

The considerations underlying our prior orders in Dockets 6545 and 7862 have changed. The Joint Petitioners have proposed a transfer of the VY Station to NorthStar, along with new financial assurances and an accelerated decommissioning and site restoration schedule, that provides tangible benefits for the State of Vermont. Our prior orders and CPGs in Dockets 6545 and 7862 issued against a backdrop that included floating start dates and an unknown duration for decommissioning and site restoration.[81] Those orders also left the finalization of some details, such as site restoration standards, to be negotiated at a later date by the parties.[82]

The modifications of our orders proposed by the Joint Petitioners will facilitate the accelerated decommissioning and site restoration schedule that accompanies the proposed

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[78] *See* cover letter filed with petition on December 16, 2016 (including service list).

[79] *See* 30 V.S.A. § 231(a) ("For good cause, after opportunity for hearing, the Commission may amend or revoke any certificate awarded under the provisions of this section.").

[80] *See, e.g.*, Docket 7862, Order of 3/28/14 at 94-95.

[81] *Id.* at 89.

[82] *Id.* at 88, 91.

transfer of the VY Station. As we have discussed, the proposed transfer introduces new considerations with respect to the balance of risks and benefits compared to what the Commission has considered and resolved in its prior orders involving the VY Station. Because the underlying considerations have changed, the issues and claims presented in this case are different from those the Commission has previously addressed. Issue preclusion and claim preclusion,[83] therefore, do not apply.

VIII. ORDER

IT IS HEREBY ORDERED, ADJUDGED, AND DECREED by the Vermont Public Utility Commission ("Commission") that:

1. The direct acquisition of a controlling interest in Entergy Nuclear Vermont Yankee, LLC ("ENVY") by NorthStar Decommissioning Holdings, LLC ("NDH"), and the indirect acquisition of a controlling interest in ENVY by NorthStar Group Holdings, LLC, LVI Parent Corporation, and NorthStar Group Services, Inc., will promote the public good and are approved pursuant to 30 V.S.A. § 107.

2. The ownership and operation of the Vermont Yankee Nuclear Power Station in Vernon, Vermont ("VY Station") by ENVY, which is to be renamed NorthStar Vermont Yankee, LLC ("NorthStar VY"), and NorthStar Nuclear Decommissioning Company, LLC ("NorthStar NDC") will promote the general good of the State. Accordingly, there is good cause to amend, effective upon the acquisition of ENVY by NDH, the certificate of public good ("CPG") issued pursuant to 30 V.S.A. § 231 to ENVY and Entergy Nuclear Operations, Inc. ("ENOI") to change ENVY's name and to substitute NorthStar NDC for ENOI, and to issue an amended CPG in accordance with this Order. NorthStar NDC shall assume all the obligations of ENOI under prior Commission Orders and CPGs to operate and perform decommissioning and site restoration at the VY Station and as otherwise provided in this Order and the amended CPG.

3. The issuance by ENVY of a note payable to Vermont Yankee Asset Retirement Management in the approximate amount of $145 million will promote the general good of the

[83] *See also In re Tariff Filing of Vermont Public Service Corp.*, 172 VT 14, 41 (2001) (noting that claim preclusion is inconsistent with a statutory scheme authorizing the Commission to make modifications to prior determinations).

State, and consent for such note issuance is granted pursuant to 30 V.S.A. § 232.

4. The memorandum of understanding filed with the Commission on March 2, 2018, among ENVY, Entergy Nuclear Vermont Investment Company, LLC, ENOI, NDH, NorthStar Group Holdings, LLC, NorthStar NDC, NorthStar Group Services, Inc., LVI Parent Corporation, the Vermont Department of Public Service ("Department"), the Vermont Agency of Natural Resources, the Elnu Abenaki Tribe, the Abenaki Nation of Missisquoi, Windham Regional Commission, the New England Coalition of Nuclear Pollution, Inc., the Town of Vernon Planning and Economic Development Commission, and the Vermont Attorney General's Office is approved, and the terms of this memorandum of understanding ("MOU"), which is attached to this Order as Appendix D, are incorporated as terms of this Order.

5. The site restoration standards described and provided for in the MOU are approved by the Commission.

6. The Commission's Order of March 28, 2014, in Docket 7862 is amended to allow the contribution of the assets of the site restoration trust to a segregated sub-account of the nuclear decommissioning trust.

7. Prior to the closing of the acquisition of ENVY by NDH, the Department shall make a filing with the Commission stating that it is satisfied, based on a review of the final forms of agreements and other documents related to the escrow account provided for in paragraph 2. c. of the MOU and of documents constituting the pollution legal liability insurance policy provided for in paragraph 2. e. of the MOU, that such documents comply with the requirements of the MOU and, to the extent reasonably possible, will protect the interests of the State of Vermont in the event of the insolvency or bankruptcy of NorthStar VY or NorthStar Group Services, Inc. In the case of the pollution liability insurance policy, the Department shall also confirm that the policy is reasonably assignable and includes the State of Vermont as an additional insured party.

8. Within five days of the closing of NDH's acquisition of ENVY, the joint petitioners shall make a filing informing the Commission as to the closing of the acquisition and the date on which it occurred.

Dated at Montpelier, Vermont this 6th day of December, 2018.

Margaret Cheney	)	PUBLIC UTILITY
	)	
	)	COMMISSION
Sarah Hofmann	)	OF VERMONT

OFFICE OF THE CLERK

Filed: December 6, 2018

Attest: Judith C. Whitney
Clerk of the Commission

Notice to Readers: This decision is subject to revision of technical errors. Readers are requested to notify the Clerk of the Commission (by e-mail, telephone, or in writing) of any apparent errors, in order that any necessary corrections may be made. (E-mail address: puc.clerk@vermont.gov)

Appeal of this decision to the Supreme Court of Vermont must be filed with the Clerk of the Commission within 30 days. Appeal will not stay the effect of this Order, absent further order by this Commission or appropriate action by the Supreme Court of Vermont. Motions for reconsideration or stay, if any, must be filed with the Clerk of the Commission within 28 days of the date of this decision and Order.

APPENDIX A – APPEARANCES

For the Vermont Department of Public Service

James Porter, Esq
Daniel Burke, Esq.
Vermont Department of Public Service
and
Robert C. Kirsch, Esq.
Bonnie Heiple, Esq.
Felicia H. Ellsworth, Esq.
Nathaniel Custer, Esq.
Mark Gordon, Esq.
Wilmer Cutler Pickering Hale and Dorr, LLP

For the NorthStar Petitioners[84]

Joselyn L. Wilschek, Esq.
Wilschek Iarrapino Law Office, PLLC

For the Entergy Petitioners[85]

John H. Marshall, Esq.
Downs Rachlin Martin PLLC

Daniel P. Richardson, Esq.
Tarrant Gillies and Richardson
and
Sanford I. Weisburst, Esq.
Jonathan B. Oblak, Esq.
Ingrid Scholze, Esq.
Quinn Emanuel Urquhart & Sullivan, LLP

For the Vermont Agency of Natural Resources

Jordan Gonda, Esq.
John Zaikowski, Esq.
Vermont Agency of Natural Resources

For the Vermont Attorney General's Office

Joshua R. Diamond, Esq.

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[84] NorthStar Decommissioning Holdings, LLC ("NDH"), NorthStar Nuclear Decommissioning Company, LLC ("NorthStar NDC"), NorthStar Group Services, Inc., LVI Parent Corporation, NorthStar Group Holdings, LLC.

[85] Entergy Nuclear Vermont Investment Company, LLC ("ENVIC") and Entergy Nuclear Operations, Inc. ("ENOI"), and any other necessary affiliated entities to transfer ownership of Entergy Nuclear Vermont Yankee, LLC ("ENVY").

Vermont Attorney General's Office

For Windham Regional Commission

Lawrence Christopher Campany
Executive Director, Windham Regional Commission

For the Town of Vernon Planning and Economic Development Commission

David Carpenter, Esq.
Facey, Goss & McPhee, P.C.

For the Conservation Law Foundation

Sandra Levine, Esq.
Conservation Law Foundation

For the New England Coalition on Nuclear Pollution

James A. Dumont, Esq.
Law Office of James A. Dumont

Other Parties (did not make appearance at evidentiary hearings)

Elnu Abenaki Tribe

Abenaki Nation of Missisquoi

Associated Industries of Vermont

International Brotherhood of Electrical Workers, Local 300

APPENDIX B -- PROCEDURAL HISTORY

On December 16, 2016, the Joint Petitioners[86] filed the petition, which was accompanied by prefiled testimony and exhibits.

On January 27, 2017, the New England Coalition on Nuclear Pollution, Inc. ("NEC") filed a motion to intervene.

On February 1, 2017, the Vermont Public Utility Commission ("Commission") held a prehearing conference in this case.

On February 3, 2017, the Windham Regional Commission ("WRC") filed a motion to intervene.

On February 8, 2017, the Commission issued a prehearing conference memorandum and scheduling Order.

On February 14, 2017, the Conservation Law Foundation ("CLF") filed a motion to intervene.

On February 20, 2017, the International Brotherhood of Electrical Workers, Local 300 ("IBEW") filed a motion to intervene.

On February 22, 2017, the Commission issued an order granting the intervention motions of NEC and WRC.

On March 1, 2017, the Vermont Office of the Attorney General ("AGO"), the Vermont Agency of Natural Resources ("ANR"), the Town of Vernon Planning and Economic Development Commission ("Vernon"), and Associated Industries of Vermont ("AIV") each filed a motion to intervene.

On March 7, 2017, the Elnu Abenaki Tribe filed a motion to intervene.

On March 10, 2017, the Joint Petitioners filed supplemental prefiled testimony and exhibits.

On March 13, 2017, the Commission issued an Order granting the intervention motions of CLF, IBEW, AGO, ANR, Vernon, and AIV.

[86] NorthStar Decommissioning Holdings, LLC, NorthStar Nuclear Decommissioning Company, LLC, NorthStar Group Services, Inc., LVI Parent Corporation, NorthStar Group Holdings, LLC, Entergy Nuclear Vermont Investment Company, LLC and Entergy Nuclear Operations, Inc., and any other necessary affiliated entities to transfer ownership of Entergy Nuclear Vermont Yankee, LLC.

On March 15, 2017, the Abenaki Nation of Missisquoi filed a motion to intervene.

On March 17, 2017, the Commission issued an Order granting the intervention motion of the Elnu Abenaki Tribe.

On March 24, 2017, the Commission issued an Order granting the intervention motion of the Abenaki Nation of Missisquoi.

On April 6, 2017, the Commission held a public hearing in Vernon, Vermont.

On April 20, 2017, the Commission issued a revised scheduling Order.

On May 5, 2017, NEC filed a motion for summary judgment, which it withdrew on March 12, 2018.

On May 26, 2017, the Commission issued a Procedural Order Re: Protective Agreement.

On June 30, 2017, the Commission issued a Procedural Order Re: Special Protocol for the confidential treatment of certain discovery documents.

On July 24 and August 22, 2017, the Commission issued revised scheduling Orders.

On August 30, 2017, the Vermont Department of Public Service ("DPS"), ANR, CLF, and NEC each submitted prefiled testimony and exhibits.

On September 13, 2017, Vernon submitted prefiled testimony and exhibits.

On October 17, 2017, the Joint Petitioners submitted prefiled rebuttal testimony and exhibits.

On December 1, 2017, the DPS, ANR, CLF, and NEC each submitted prefiled surrebuttal testimony and exhibits.

On January 11, 2018, the Commission issued a Protective Order for Prefiled Evidence.

On January 12, 2018, the Commission issued a Procedural Order postponing the evidentiary hearings.

On February 1, 2018, the Commission issued a reconsideration Order related to certain determinations in the Protective Order for Prefiled Evidence of January 11, 2018.

On February 23, 2018, the Commission held a status conference.

On March 2, 2018, the DPS filed a memorandum of understanding ("MOU") among the Joint Petitioners, the DPS, ANR, WRC, Vernon, NEC, the Elnu Abenaki Tribe, the Abenaki Nation of Missisquoi, and, as to certain matters, AGO.

On March 9, 2018, the Joint Petitioners, the DPS, ANR, and Vernon submitted

supplemental prefiled testimony in support of the MOU.

On April 10, 2018, CLF submitted supplemental prefiled testimony and exhibits.

On April 12, 2018, the Commission held a second public hearing in Brattleboro, Vermont.

On May 3, 2018, Vernon submitted supplemental prefiled testimony in response to Commission questions to the parties that were distributed on April 24, 2018.

On May 4, 2018, the Joint Petitioners, DPS, and ANR submitted supplemental prefiled testimony in response to Commission questions.

On May 8, 2018, CLF submitted supplemental prefiled testimony and exhibits in response to Commission questions.

On May 10, 11, and 14, 2018, the Commission held evidentiary hearings in Montpelier, Vermont.

On May 23, 2018, the Joint Petitioners filed supplemental testimony and exhibits.

On June 11, 2018, the Commission issued an Order Re: Certain Requests and Confidential Treatment of NorthStar Financial Statements.

On June 11, 2018, the Joint Petitioners (joined by the Elnu Abenaki Tribe), DPS, ANR, AGO, WRC, NEC, and CLF each filed briefs and proposed findings.

On June 25, 2018, the Joint Petitioners, DPS, ANR, AGO, Vernon, NEC, the Elnu Abenaki Tribe, and CLF each filed reply briefs or comments.

On July 2, 2018, the Joint Petitioners filed supplemental testimony and exhibits.

On July 6, 2018, the Commission issued a Procedural Order related to the Commission's determination to delay a decision in this case until after a ruling by the U.S. Nuclear Regulatory Commission ("NRC") on the transfer of NRC licenses and possible additional process.

On July 31, 2018, the DPS filed, on behalf of the MOU parties, an amendment to the MOU that modified the date references in paragraph 13 of the MOU.

On October 19, 2018, the Joint Petitioners filed supplemental testimony and exhibits.

On October 24, 2018, the Commission issued a Procedural Order Concerning Ruling by U.S. Nuclear Regulatory Commission and Related Party Filings.

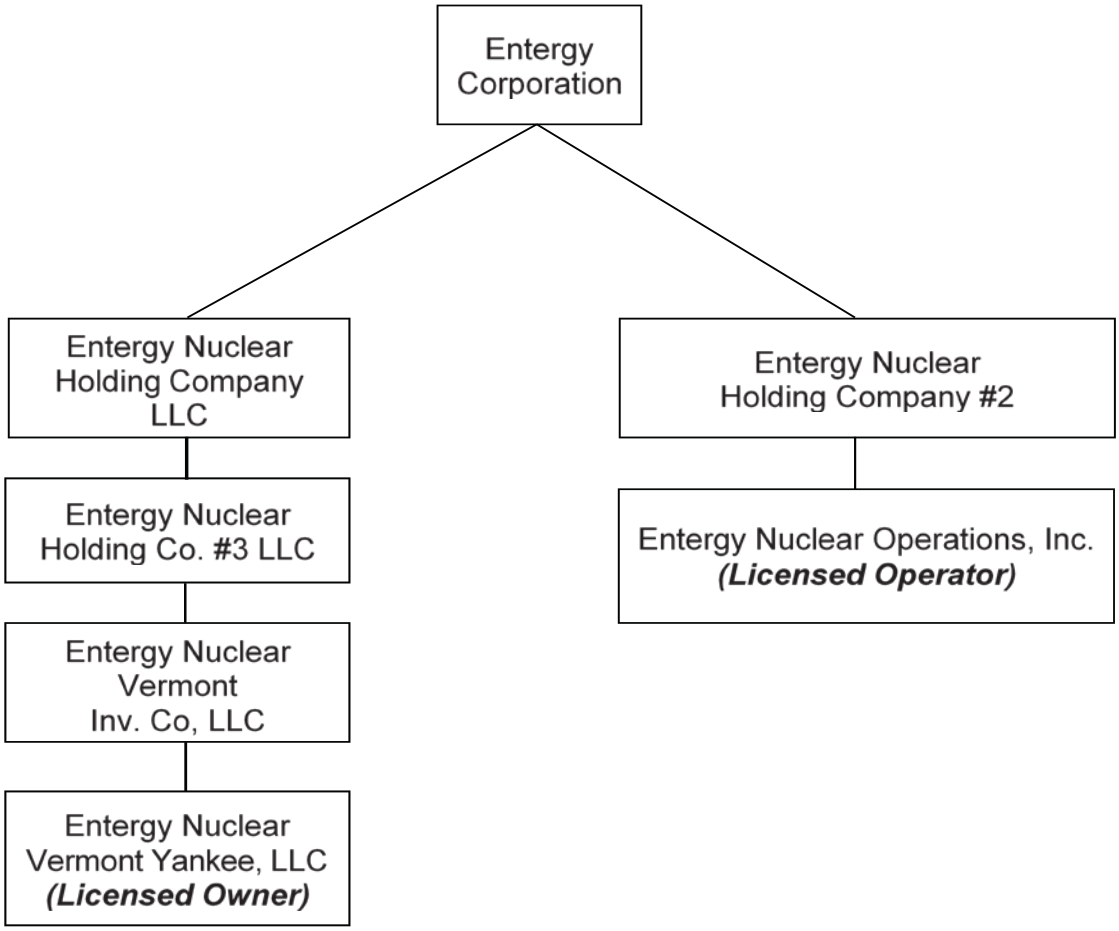
On October 30, 2018, the Joint Petitioners filed, on behalf of the MOU parties, an amendment to the MOU that further modified the date references in paragraph 13 of the MOU.

On December 3, 2018, the DPS filed, on behalf of the MOU parties, another amendment to the MOU that modified the date references in paragraph 13 of the MOU to December 10, 2018.

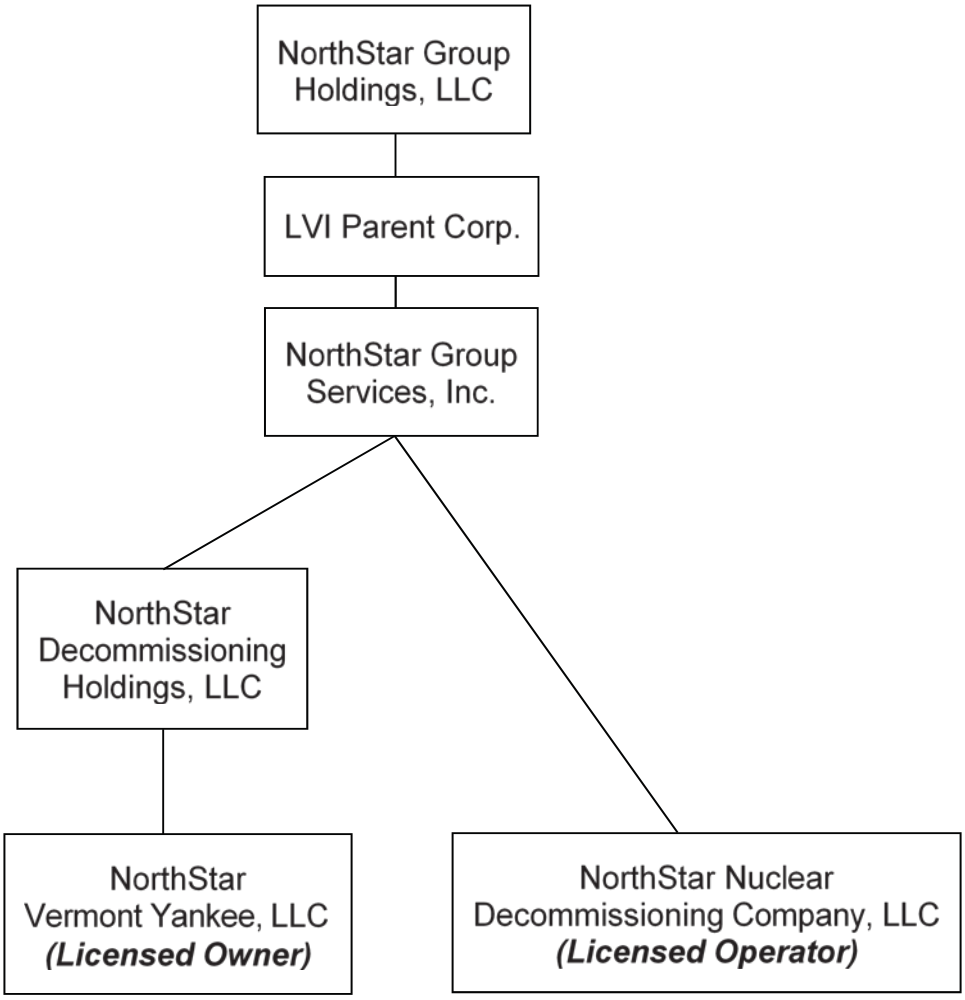
APPENDIX C – SIMPLIFIED ORGANIZATIONAL CHARTS

From JP-SES-SUPP-1

Simplified Pre-Transfer Organization



Simplified Post-Transfer Organization

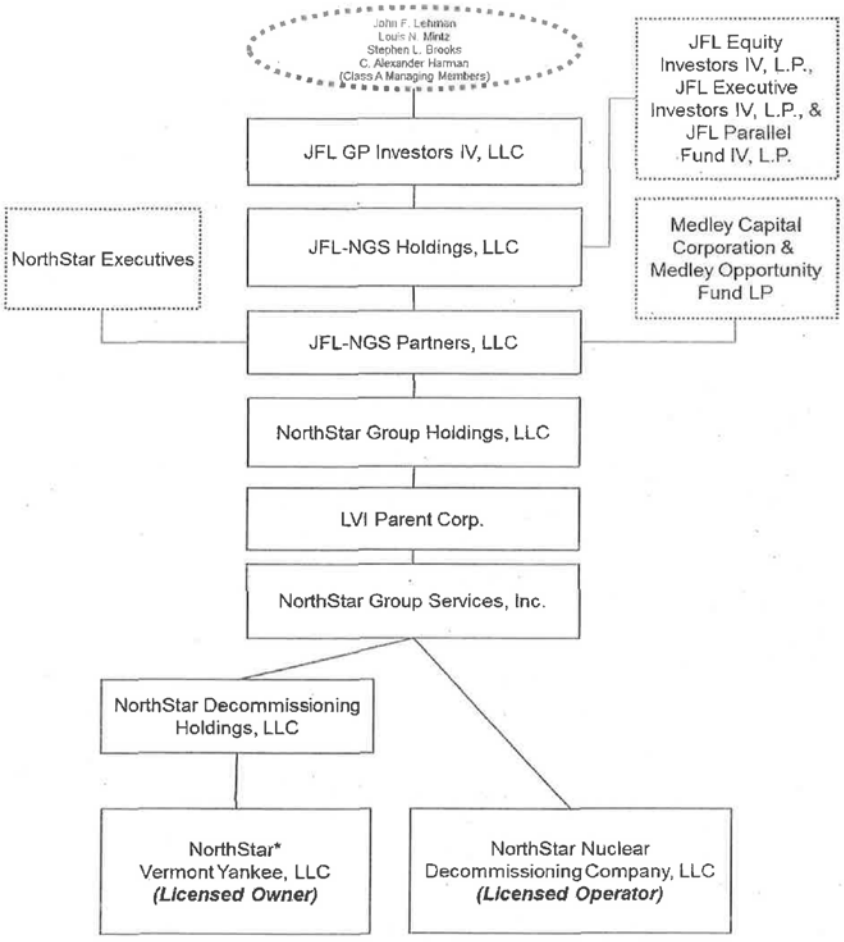


From exhibit PUC-4

Simplified Post-Transfer Organization

(including owners of NorthStar Group Holdings, LLC)

Figure 2 (Revised): SIMPLIFIED ORGANIZATION CHART



* Formerly known as Entergy Nuclear Vermont Yankee, LLC

APPENDIX D – MEMORANDUM OF UNDERSTANDING AND ATTACHMENTS

(not including amendments to change date references in paragraph 13)

STATE OF VERMONT
PUBLIC UTILITY COMMISSION

Joint Petition of NorthStar Decommissioning Holdings, LLC, NorthStar Nuclear Decommissioning Company, LLC, NorthStar Group Services, Inc., LVI Parent Corp., NorthStar Group Holdings, LLC, Entergy Nuclear Vermont Investment Company, LLC, and Entergy Nuclear Operations, Inc., and any other necessary affiliated entities to transfer ownership of Entergy Nuclear Vermont Yankee, LLC, and for certain ancillary approvals, pursuant to 30 V.S.A. §§ 107, 231, and 232	)	**Docket No. 8880**

MEMORANDUM OF UNDERSTANDING

With respect to the above-captioned docket, Entergy Nuclear Vermont Yankee, LLC ("ENVY"); Entergy Nuclear Vermont Investment Company, LLC ("ENVIC"), Entergy Nuclear Operations, Inc. ("ENOI") (together, "Entergy"); NorthStar Decommissioning Holdings, LLC; NorthStar Group Holdings, LLC; NorthStar Nuclear Decommissioning Company, LLC ("NorthStar NDC"); NorthStar Group Services, Inc., LVI Parent Corp.; (together, "NorthStar"[1]), the Vermont Department of Public Service ("DPS"), the Vermont Agency of Natural Resources ("ANR"), the Elnu Abenaki Tribe, the Abenaki Nation of Missisquoi, Windham Regional Commission, the New England Coalition on Nuclear Pollution, Inc., and the Town of Vernon Planning and Economic Development Commission (collectively, "the Parties"), and as to certain provisions, the Vermont Attorney General's Office ("AGO"), stipulate and agree as follows:

WHEREAS, ENVY and ENOI hold a Certificate of Public Good ("CPG") to own, operate, and decommission the Vermont Yankee Nuclear Power Station ("VY Station") located in Vernon, Vermont;

WHEREAS, on November 7, 2016, ENVY and its parent company, ENVIC, entered into a Membership Interest Purchase and Sale Agreement ("MIPA") with NorthStar Decommissioning Holdings, LLC and NorthStar Group Holdings, LLC, under which NorthStar Decommissioning Holdings, LLC would acquire 100% of the membership interests of ENVY, which would then be renamed NorthStar Vermont Yankee, LLC ("NorthStar VY") (the "Proposed Transaction");

WHEREAS, if the Proposed Transaction is completed, NorthStar Decommissioning Holdings, LLC has committed to begin active decommissioning[2] and site restoration at the VY

[1] To the extent that a provision in this Memorandum of Understanding ("MOU") applies to "NorthStar" after the closing of the Proposed Transaction, "NorthStar" shall also include NorthStar Vermont Yankee, LLC.

[2] Except where expressly noted, as used in this MOU, "decommission" and "decommissioning" refer to the

Station site no later than 2021 (and possibly as early as 2019) and to complete those tasks at the VY Station site (except at the Independent Spent Fuel Storage Installation ("ISFSI") and VELCO switchyard) no later than the end of 2030 (and possibly as early as 2026);

WHEREAS, the closing of the Proposed Transaction is contingent upon several conditions, including approval by the Vermont Public Utility Commission ("PUC") and the U.S. Nuclear Regulatory Commission ("NRC");

WHEREAS, on December 16, 2016, NorthStar, ENVIC, and ENOI submitted a joint petition to the Vermont Public Service Board (now the PUC) requesting approval of the Proposed Transaction ("Joint Petition"), including approval of the transfer of ownership of ENVY, and certain ancillary approvals;

WHEREAS, on February 9, 2017, ENOI, ENVY, and NorthStar NDC submitted a joint application to the NRC requesting the NRC's consent to the direct and indirect transfers of control over the NRC-issued VY Station operating license; and

WHEREAS, in consideration of the compromises made by and between the Parties to this MOU, NorthStar and Entergy have made the commitments described below;

NOW, THEREFORE, the Parties agree as follows:

1. The Parties hereto agree that the approval of the Proposed Transaction, if all terms and conditions described in this MOU are met, will promote the general good of the State of Vermont. The Parties shall jointly request that the PUC issue an Order approving the terms and conditions of this MOU, incorporating certain of them as terms and conditions of the Order, and taking such actions as in the PUC's judgment are necessary or advisable in connection with the resolution of the Joint Petition, including granting the following elements of relief requested in the Joint Petition:

    a. Approve the transfer of ownership of ENVY to NorthStar Decommissioning Holdings, LLC, including the resulting transfer of the Nuclear Decommissioning Trust ("NDT") and Site Restoration Trust ("SRT"), pursuant to the terms of the MIPA;

    b. Consent under 30 V.S.A. § 232 for ENVY/NorthStar VY to issue a note payable to Vermont Yankee Asset Retirement Management, LLC ("VYARM") in the amount of approximately $145 million, subject to Paragraph 3 below;

    c. Amend the CPG currently held by ENVY and ENOI to change ENVY's name to NorthStar VY and to substitute NorthStar NDC for ENOI;

    d. Authorize NorthStar NDC to assume the obligations of ENOI under prior PUC orders and CPGs to operate and to perform decommissioning and site restoration at the VY

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removal of a facility or site safely from service and the reduction of residual radioactivity to a level that permits termination of the license issued by the U.S. Nuclear Regulatory Commission ("NRC"). As used in this MOU, "decommissioning" does not include spent fuel management activities.

Station site, including as reflected herein, and by the PUC in approving the transaction;

e. Approve site restoration standards for the VY Station site, as set forth in Paragraph 5 below; and

f. Amend the Docket No. 7862 Order to allow contribution of the assets of the SRT into a segregated sub-account of the NDT.

2. NorthStar shall provide financial assurance in support of the Proposed Transaction as follows.

a. NorthStar shall provide the financial assurance package proposed by NorthStar in the Joint Petition to complete the decommissioning and site restoration of the VY Station site, including the following components:

(1) the NDT;

(2) the SRT funds, dedicated to funding site restoration activities, which Entergy will transfer to a segregated sub-account of the NDT at or before the closing of the Proposed Transaction(as used hereinafter, the term "NDT" shall include the segregated site restoration sub-account);

(3) performance bonds or equivalent performance assurance on major subcontracted work with a value of approximately $400 million, substantially in the form of Attachment 1;

(4) a $25 million contingent letter of credit tied to start and/or completion date milestones,[3] payable to the VY Station Decommissioning Completion Trust, and substantially in the form of Attachment 2;

(5) a Support Agreement from NorthStar Group Services, Inc., payable to the VY Station Decommissioning Completion Trust in the amount of $140 million;

(6) a commitment by NorthStar VY not to withdraw funds from the NDT for any task in an amount exceeding that specified for that task in version 1.0 of the pay-item disbursement schedule dated September 8, 2016; and

(7) $10 million in expected litigation proceeds from NorthStar VY's "Round 3" claim against the U.S. Department of Energy ("DOE") for the recovery of

[3] The "start" date is the initiation of Railroad Refurbishment on or before the later of January 1, 2021, or the date that is one hundred eighty (180) days after the date of completion of the ISFSI Expansion. The "completion" date is release pursuant to 10 C.F.R. § 50.83 and completion of Site Restoration of all portions of the Site other than the ISFSI on or before the later of December 31, 2030, or the date that is ten (10) years after the date of completion of the ISFSI Expansion. All capitalized terms in this footnote are ascribed the same meaning within this MOU as is set out in the MIPA and the Decommissioning Completion Assurance Agreement.

costs for existing ISFSI operations activities, to be deposited in the VY Station Decommissioning Completion Trust.

b. NorthStar Group Services, Inc. shall execute Attachment 3 regarding the $140 million Support Agreement. NorthStar Group Services, Inc. shall update the Support Agreement that was filed with the NRC on February 7, 2017, as modified by a letter filed with the NRC on December 22, 2017, to clarify that the Support Agreement is available for State of Vermont site restoration requirements, in addition to NRC requirements related to decommissioning and spent fuel management. NorthStar Group Services, Inc. further agrees that, regardless of any limitations expressed in the Support Agreement:

(1) the PUC has authority to order NorthStar Group Services, Inc. to provide funding up to the $140 million Support Agreement limit, supported by a reasonable determination by the Commissioner of DPS and the Secretary of ANR[4] that additional work at the site is needed to complete site restoration, and after NorthStar Group Services, Inc. has an opportunity to present its position on the need for such funding to the PUC; and

(2) NorthStar shall not seek any amendment, termination, or assignment of the Support Agreement for any reason without first obtaining approval of the PUC, including a PUC determination that the amendment, termination, or assignment will not impact NorthStar's ability to complete site restoration.

c. NorthStar shall establish an escrow account that will have a minimum balance of $55 million. The escrow account shall be funded over time as follows: (1) at the closing of the Proposed Transaction, NorthStar shall deposit $30 million into the escrow account; and (2) after the Proposed Transaction has closed, and after NorthStar VY has withdrawn the first $100 million from the NDT, NorthStar shall deposit an additional $25 million into the escrow account over time, which shall be accomplished by depositing 10% of each invoice paid with funds from the NDT for decommissioning or site restoration work at the VY Station site. NorthStar represents that NorthStar VY is expected to withdraw the first $100 million from the NDT before the end of 2021, and the escrow account balance is projected to reach $55 million before the end of 2024. All earnings on escrow account funds will be retained in the account, and the full amount of account funds are to be used to fund completion of decommissioning and/or site restoration activities at the VY Station site, in the event and to the extent that NDT funds are insufficient or unavailable, consistent with Paragraph 4.

(1) Withdrawals from this escrow account may be made only with approval from DPS and ANR. Reasonable requests for withdrawals for site restoration shall not be denied, subject to a determination, consistent with Paragraph 4, that proceeds from claims under the Pollution Legal Liability product described in

[4] References to DPS and ANR hereafter refer to the Commissioner in the case of DPS and the Secretary in the case of ANR.

Paragraph 2(e) and funds available pursuant to the Support Agreement are insufficient or unavailable.

(2) NorthStar may terminate the escrow account, and any funds remaining in the escrow account may be withdrawn by NorthStar and used for any purpose in its sole discretion, after: (i) NorthStar completes partial site release of the VY Station site (with the exception of the ISFSI and VELCO switchyard) as approved by the NRC pursuant to 10 C.F.R. § 50.83 or an approved license termination plan; and (ii) NorthStar has submitted all corrective action construction completion reports for the VY Station site (with the exception of the buildings and structures identified in Paragraph 5(f)) to ANR and ANR determines that no additional site investigation or corrective actions are required, except long-term monitoring, pursuant to the process set forth in the Investigation and Remediation of Contaminated Properties Rule dated July 27, 2017 ("I-Rule").

(3) The escrow account shall be maintained with a commercial bank or trust company incorporated under the laws of the United States or any state thereof, and for purposes of this requirement, M&T Bank, Wilmington Trust, and JPMorgan Chase shall be deemed acceptable institutions. Other institutions may be selected, subject to the requirements of maintaining an office or branch in New York, New York, having an aggregate capital surplus in excess of $25 billion, and having a senior unsecured debt rated at least "A" by Standard & Poors Corporation or "A2" by Moody's Investor Service.

d. NorthStar shall obtain an unconditional guaranty from Orano USA LLC (formerly AREVA Nuclear Materials, LLC) ("Orano Guaranty") to provide $25 million of funding to complete decommissioning and/or site restoration activities at the VY Station site in the event and to the extent that the total amount of NDT funds, and funds available pursuant to the Support Agreement, escrow account funds described in Paragraph 2(c), and the Round 3 Retained DOE Litigation Proceeds described in Paragraphs 3(c) and (d) are insufficient or unavailable to complete such activities. The Orano Guaranty shall terminate when: (1) the reactor pressure vessel has been shipped from the VY Station site; (2) Orano receives all payments due for that work; (3) ANR, pursuant to Subchapter 3 of the I-Rule, has approved a site investigation report for each operable unit where non-radiological site investigation activities do not create an actual conflict with the Atomic Energy Act; and (4) NorthStar has certified in a submission with then current figures and data, and DPS has confirmed (which shall be deemed to have occurred if DPS has not responded in writing to NorthStar's certification within 60 calendar days), that the value of the NDT is greater than the combined remaining estimated license termination and site restoration costs, including, without limitation, as shown in the notices and certifications to be provided by NorthStar pursuant to Paragraph 2.

e. NorthStar shall obtain a $30 million Pollution Legal Liability ("PLL") insurance product, substantially in the form of Attachment 4, that will provide coverage for site restoration activities to address previously unknown or not fully characterized

non-radiological environmental conditions identified at the VY Station site after the closing of the Proposed Transaction. This policy may be terminated by NorthStar at the time NorthStar completes the decommissioning and site restoration of the VY Station site (with the exception of the buildings and structures identified in Paragraph 5(f)), but NorthStar shall maintain such PLL coverage until completion of that work.

f. NorthStar shall provide to DPS, ANR, and AGO monthly summaries of all expenditures at the site. Those agencies shall be permitted access to and shall have the right to inspect those expenditures and the books of NorthStar Group Holdings, LLC, NorthStar Group Services, Inc., and NorthStar VY at all reasonable times and at reasonable intervals.

g. NorthStar shall notify DPS, ANR, and AGO within 7 calendar days of any of the following events.

(1) All significant changes to NorthStar Group Services, Inc.'s ability to support or fund the Support Agreement, including any significant reduction in overall debt capacity;

(2) Every draw on the Support Agreement;

(3) Any event that has occurred in the conduct of decommissioning, spent fuel management, or site restoration activities at the VY Station site that could, individually or cumulatively with other events, have an adverse financial consequence of greater than $2 million, including but not limited to accidents, delays, contractual disputes, unknown site conditions, and changes in regulatory requirements, including a detailed description of the event and an assessment of the amount of any such consequence along with any mitigation plan(s);

(4) Any proposed organizational change or change in equity ownership of NorthStar Group Holdings, LLC; NorthStar Group Services, Inc.; and/or NorthStar VY; and

(5) Any breach of debt covenants, default, acceleration, insolvency, reorganization, bankruptcy or liquidation of NorthStar Group Holdings, LLC; NorthStar Group Services, Inc.; and/or NorthStar VY.

h. On or before March 31 of each calendar year following the close of the Proposed Transaction, NorthStar shall provide to DPS, ANR, VDH, and AGO an annual public certification that includes the following:

(1) A detailed description of all work completed as of that date pursuant to corrective action plans approved by ANR pursuant to Subchapter 5 of the I-Rule;

(2) A detailed description and schedule of remaining corrective actions and site restoration work;

(3) The amount of funds available for site restoration as of the end of the calendar year preceding the date of the report; and

(4) The amount of funds estimated to be required to complete site restoration.

This annual requirement shall continue until (i) NorthStar completes partial site release of the VY Station site (with the exception of the ISFSI and VELCO switchyard) as approved by the NRC pursuant to 10 C.F.R. § 50.83 or an approved license termination plan; and (ii) NorthStar has submitted all corrective action construction completion reports for the VY Station site (with the exception of the buildings and structures identified in Paragraph 5(f)) to ANR and ANR determines that no additional site investigation or corrective actions are required, except long-term monitoring, pursuant to the process set forth in the I-Rule.

i. On or before March 31 of each calendar year following the close of the Proposed Transaction, NorthStar shall provide to DPS the following disclosures and reports covering the prior calendar year (or specified 12-month period):

(1) Audited financials for NorthStar Group Holdings, LLC and NorthStar Group Services, Inc. as of the end of the calendar year preceding the report date;

(2) Audited statements of NDT and SRT fund balances (with current investment mix), and an accounting of all disbursements from such accounts;

(3) A schedule of both cumulative historic (from the closing date of the Proposed Transaction) and projected fund activity for NDT and SRT funds, including a breakdown of all future decommissioning, site restoration, and spent fuel management activities, including an updated "pay item disbursement schedule" and provide the equivalent of an update of the current "Deal Model" through completion of partial site release and site restoration of the VY Station site (with the exception of the buildings and structures identified in Paragraph 5(f)); and

(4) A variance analysis, comparing actual disbursements detailed in the updated "Deal Model" to estimated disbursements in the prior year's reporting, explaining all variances in excess of 10% or $2 million.

This annual requirement shall continue until (i) NorthStar completes partial site release of the VY Station site (with the exception of the ISFSI and VELCO switchyard) as approved by the NRC pursuant to 10 C.F.R. § 50.83 or an approved license termination plan; and (ii) NorthStar has submitted all corrective action construction completion reports for the VY Station site (with the exception of the buildings and structures identified in Paragraph 5(f)) to ANR and ANR determines that no additional site investigation or corrective actions are required, except long-

term monitoring, pursuant to the process set forth in the I-Rule.

j. To the extent NorthStar determines that the information it must submit to DPS, ANR, VDH, or AGO pursuant to this MOU constitutes NorthStar trade secret or confidential business information or other information that is exempt from the public inspection and copying requirements of the Vermont Public Records Act (1 V.S.A. §§ 315-320), NorthStar shall designate the information as such and shall provide a redacted version suitable for public disclosure, unless redaction would render the document meaningless.

3. Entergy shall provide financial assurance in support of the Proposed Transaction as follows.

a. Entergy shall contribute to the SRT an amount that will bring the balance of the SRT at the closing of the Proposed Transaction to $60 million. Pursuant to the MOU adopted in Docket No. 7862, at the time the SRT balance reaches $60 million, including as a result of such contribution, Entergy Corporation will terminate the existing $20 million parent guaranty in support of the SRT. Prior to the closing of the Proposed Transaction, Entergy shall contribute 100% of the SRT assets into a segregated sub-account in the NDT for the purpose of completing site restoration activities. For the avoidance of doubt, the Parties agree that such contribution is an Entergy contribution and not a contribution made by Vermont ratepayers. Any amounts remaining in such sub-account after NorthStar completes decommissioning and has submitted all corrective action construction completion reports for the VY Station site (with the exception of the buildings and structures identified in Paragraph 5(f)) to ANR and ANR determines that no additional site investigation or corrective actions are required, except long-term monitoring, pursuant to the process set forth in the I-Rule, shall belong solely to NorthStar VY and shall not be considered "Excess Funds" that are subject to Paragraph 3 of the MOU entered in Docket No. 6545 (as modified by the Order issued on June 13, 2002, in Docket No. 6545).

b. Pursuant to Section 1.1 of the Decommissioning Completion Assurance Agreement ("DCAA"), ENVY will file the Round 3 claim against the DOE for the recovery of spent fuel management costs 30 days after the earlier of (i) the date all physical work related to the VY Station dry fuel storage transfer project has been completed and all invoices for such work have been paid; or (ii) the closing date of the Proposed Transaction. The Round 3 claim is expected to include, among other costs, approximately $145 million for the second ISFSI pad construction and the costs associated with the 2017-18 fuel loading campaigns. Pursuant to section 6.23 of the MIPA, at the closing of the Proposed Transaction, VYARM and NorthStar VY will enter into a promissory note for this amount, which NorthStar VY will be required to repay to VYARM upon NorthStar VY's receipt of sufficient proceeds from the Round 3 DOE litigation (expected in approximately 2023), and if such funds are insufficient to repay the note, NorthStar VY will pay the remaining balance only after NorthStar completes the decommissioning and site restoration of the VY Station site (with the exception of the buildings and structures identified in Paragraph 5(f)).

c. Notwithstanding any contrary requirement of transactional documents (including, without limitation, the MIPA and DCAA), NorthStar VY shall retain and deposit into an escrow account (separate from the escrow account described in Paragraph 2(c)) the first $40 million received from the Round 3 DOE litigation (the "Round 3 Retained DOE Litigation Proceeds"), and shall not transfer those funds to VYARM, unless all of the following conditions are satisfied at the latter of the time that money is received, or April 30, 2023.

(1) The complaint initiating the Round 3 DOE litigation was filed on or before 30 days after the earlier of (i) the date all physical work related to the VY Station dry fuel storage transfer project has been completed and all invoices for such work have been paid; or (ii) the Proposed Transaction closing date;

(2) NorthStar has certified in a submission with then current figures and data, and DPS has confirmed (which shall be deemed to have occurred if DPS has not responded to NorthStar's certification within 60 calendar days), that the value of the NDT is greater than the combined remaining estimated license termination and site restoration costs, including, without limitation, as shown in the notices and certifications to be provided by NorthStar pursuant to Paragraph 2;

(3) ANR has determined: (i) pursuant to Section 35-306(b) of the I-Rule that the site investigation report is complete and adequately defines the scope and extent of contamination for all operable units at the VY Station Site (except at the buildings and structures identified in Paragraph 5(f)); and (ii) that NorthStar is in substantial compliance with all approved corrective action plan(s) pursuant to Subchapter 5 of the I-Rule; and

(4) NorthStar has not: (i) made any payments for the project using funds from the Support Agreement identified in Paragraph 2(a)(5) that cumulatively exceed $40 million; and (ii) filed any notice required by Paragraph 2(g)(1).

d. The Round 3 Retained DOE Litigation Proceeds referred to in Paragraph 3(c) shall remain in the escrow account to be used for funding decommissioning and/or site restoration activities at the VY Station site in the event and to the extent that NDT funds are insufficient or unavailable to complete such activities, consistent with Paragraph 4. The Round 3 Retained DOE Litigation Proceeds shall remain in the escrow account until the earlier of the following:

(1) The conditions in Paragraph 3(c) have each been met at the time, or, in the case of Paragraph 3(c)(1) and (3), either before or at the time, a request to release the funds has been made by NorthStar, Entergy, or VYARM; or

(2) NorthStar completes partial site release of the VY Station site (with the exception of the ISFSI and VELCO switchyard) as approved by the NRC pursuant to 10 C.F.R. § 50.83 or an approved license termination plan, and NorthStar has submitted all corrective action construction completion reports

for the VY Station site (with the exception of the buildings and structures identified in Paragraph 5(f)) to ANR and ANR determines that no additional site investigation or corrective actions are required, except long-term monitoring, pursuant to the process set forth in the I-Rule.

At the time that either one of the above requirements has been met, NorthStar VY shall transfer any remaining Round 3 Retained DOE Litigation Proceeds to VYARM toward repayment of the note owed by NorthStar VY to VYARM.

4. For the avoidance of doubt, in the event and to the extent that the NDT is insufficient (or unavailable due to NorthStar's commitment in Paragraph 2(a)(6)) to complete decommissioning and/or site restoration activities at the VY Station site, NorthStar VY shall draw upon or demand the funds described in Paragraphs 2(a)-(e) and 3(c)-(d) in the following order, with each later-listed source to be drawn upon or demanded to the extent that the total funds available pursuant to the previous source are unavailable or insufficient.

   a. *First,* proceeds from claims under the PLL insurance product described in Paragraph 2(e), to the extent such claims are within the product's scope of coverage;

   b. *Second,* the Support Agreement;

   c. *Third,* the escrow account described in Paragraph 2(c);

   d. *Fourth,* the $10 million in expected litigation proceeds from NorthStar VY's Round 3 DOE claim for existing ISFSI operations activities;

   e. *Fifth,* the Round 3 Retained DOE Litigation Proceeds; and

   f. *Sixth,* the Orano Guaranty.

5. The Parties agree that the site restoration standards identified below shall apply to the VY Station site.

   a. All activities conducted at the VY Station site shall comply with applicable environmental and human-health based standards and regulations, to the extent such standards and regulations do not conflict with the standards identified in this MOU. The non-radiological environmental media standards identified in Paragraphs 5(e) and 5(g) of this MOU are the remediation standards solely for purposes of ANR's determination pursuant to item (ii) of Paragraph 2(c)(2) of this MOU and are not applicable for purposes of liability pursuant to 10 V.S.A. § 6615.

   b. All subsurface voids shall be filled, and the land shall be regraded and reseeded. All fill material must comply with the approved radiological and non-radiological remediation standards.

   c. NorthStar shall decommission, release, and restore the VY Station site: (1) while complying with the Vermont Radiological Health Rule, including meeting the

requirements for "unrestricted areas" as that term is defined in VDH Rules 5-301 and 5-302(42); (2) to a radiological dose limit of 15 mrem/year from all pathways combined, with no more than 5 mrem/year from liquid effluents; and (3) for "unrestricted use," as that term is used in 10 C.F.R. § 20.1402, and not under "restricted conditions," as that term is used in 10 C.F.R. § 20.1403. NorthStar shall attempt to attain a calculated annual 10mR TEDE All Pathways and 4mR TEDE Water residual radiation standard, but attainment of this standard will not be required if, in NorthStar's sole discretion, it is cost prohibitive or technically not feasible because of site conditions.

d. NorthStar shall complete a comprehensive site investigation and any required corrective actions in accordance with the I-Rule and pursuant to a schedule developed in consultation with the Town of Vernon and approved by ANR, which may include a phased schedule (i.e. breaking up the site into specific operable units) for site characterization and remediation.

(1) Within 60 days of the closing of the Proposed Transaction, NorthStar shall provide the Secretary of ANR with a draft site investigation workplan for the VY Station site that complies with Subchapter 3 of the I-Rule and includes the following:

(a) A list and delineation of proposed operable units for the VY Station site, including a detailed description as to whether site investigation activities or remediation of releases will create an actual conflict with the Atomic Energy Act for each operable unit. Consistent with the Atomic Energy Act, NorthStar shall delineate operable units in a manner that maximizes areas available for immediate site characterization;

(b) A plan to perform groundwater sampling of non-radiological contamination at the VY Station site that includes, at a minimum, the following:

(i) Quarterly sampling plan for list of analytes as proposed by NorthStar and approved by ANR at the VY Station site's existing groundwater monitoring well network; and

(ii) Proposal for installation and sampling of any additional monitoring wells necessary to characterize the scope and extent of non-radiological contamination.

(c) A plan to characterize below-grade structures that NorthStar proposes to leave in place pursuant to Paragraph 5(g) that includes, at a minimum, the following:

(i) Identification and description of historical uses of all below-grade structures, including all materials known or suspected to

be generated, stored, contained, spilled, released, or disposed in each structure;

(ii) Description of a process for characterization of each below-grade structure, including all steps to remove and manage all materials generated, stored, contained, spilled, released, or disposed in each below-grade structure; and

(iii) Description of a process to characterize soil and groundwater near each below-grade structure.

(d) A proposed plan for any use of concrete as fill at the VY Station site pursuant to Paragraph 5(g) that includes, at a minimum, the following elements.

(i) A detailed description of the concrete proposed to be used as fill material, including:

(1) identification of the structures from which the concrete will be obtained;

(2) identification of any paints and other coatings on the structures; and

(3) a description of all non-radiological wastes or materials that have been stored in each of the structures, any non-radiological wastes or materials which have contaminated the structures, and any wastes or materials which have been discharged from the structures.

(ii) A detailed description of how the concrete material will be processed and managed on site, including:

(1) How concrete materials will be processed (removal of rebar and other reinforcing materials), and resulting size specifications of resulting aggregate material; and

(2) Total volume of crushed aggregate material to be used as fill (expressed in cubic yards).

(iii) Identification of the specific location(s) at the site where concrete will be managed and used as fill. This shall include, at a minimum, a site map (minimum dimensions of 8½" by 11") that identifies: the location(s) on site where concrete fill material will be stockpiled; the locations(s) on site where the fill material will be disposed of; the waste management

boundary(ies) of the disposal site(s); and any other siting information required by the Secretary.

(iv) A schedule of all proposed activities to be undertaken under the plan (including characterization, demolition, on-site management, and filling activities).

(v) A plan to characterize concrete proposed to be used as fill on site that includes, at a minimum, the following:

(1) a list of all non-radiological contaminants for which the concrete from each structure will be characterized; and

(2) the specific sampling and analysis methods and processes that will be used to characterize the concrete from each structure (including all coatings or paints) for non-radiological contaminants.

(e) A proposed plan for any use of off-site materials proposed to be used as fill on site, including a plan to characterize off-site materials that includes, at a minimum, the following:

(i) a list of all non-radiological contaminants for which the off-site materials will be characterized; and

(ii) the specific sampling and analysis methods and processes that will be used to characterize the off-site materials.

(f) A proposed schedule for completion of site investigation activities for each operable unit of the VY Station site or the VY Station site. Where site investigation activities will create an actual conflict with the Atomic Energy Act for an operable unit, NorthStar shall propose a schedule that ensures commencement of site investigation activities as soon as the conflict no longer exists.

(2) ANR agrees to complete its review of the draft site investigation workplan and provide comments to NorthStar within 60 days of receiving the draft workplan that ANR determines meets the requirements of Subchapter 3 of the I-Rule. Within 30 days of receiving comments from the Secretary, NorthStar shall submit a final site investigation workplan addressing the Secretary's comments. Upon approval of the site investigation workplan by ANR, NorthStar shall implement the site investigation workplan and submit a site investigation report in accordance with the schedule approved by the Secretary of ANR.

(3) For each operable unit of the site where site investigation activities do not create an actual conflict with the Atomic Energy Act, NorthStar shall submit

a site investigation report pursuant to Section 35-305 of the I-Rule to the Secretary of ANR no later than six months after the close of the transaction.

(4) NorthStar shall complete any required corrective actions to address releases of non-radiological hazardous materials in accordance with the I-Rule.

e. NorthStar shall remediate the VY Station site to compliance with the residential standard values identified in Appendix A of the I-Rule, except as to any operable unit(s) of the VY Station site for which NorthStar submits and ANR approves an institutional control plan. Any such institutional control plan shall:

(1) be developed by NorthStar in consultation with the Town of Vernon and limit future residential uses of the site in a manner consistent with the Town Plan of the Town of Vernon; and

(2) meet the requirements of Subchapter 6 of the I-Rule.

Upon approval of the institutional control plan by ANR for an operable unit(s), NorthStar shall remediate that operable unit(s) of the VY Station site to compliance with the industrial standard values identified in Appendix A of the I-Rule.

f. NorthStar shall remove all above-ground structures at the VY Station site, other than the ISFSI and associated security facilities, the VELCO switchyard, the administrative office building known as the Plant Support Building, and the portion of the railroad spur that is able to be released for unrestricted use from the NRC-issued VY Station operating license.

g. NorthStar shall remove all underground structures at the VY Station site—including, without limitation, building foundations, buried piping, and contained piping[5]—to a depth of 4 feet below ground surface (with "ground surface" meaning existing site contours, which are depicted in Attachment 5 to this MOU) and to a greater depth wherever required to meet the site release standards described in Paragraph 5 of this MOU. Asbestos-containing material shall be removed regardless of depth. Pipes and other spaces with void space that are 4 feet below ground surface and allowed to be left in place shall be filled with concrete or other material as necessary to ensure stability of the ground above.[6] All regulated substances shall be removed from pipes and other structures, and managed in accordance with applicable standards. All sheathed cables with PCB coatings shall be excavated, and managed and disposed of in accordance with the Vermont Hazardous Waste Management Regulations and other applicable standards.

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[5] For purposes of this MOU, "buried piping" means piping that is underground and in direct contact with the ground/soil; "contained piping" means piping that is underground but within some other structure and thus not in direct contact with the ground/soil.

[6] In the case of a pipe the top portion of which is above the 4-foot cut-off, and the bottom portion of which is deeper than the 4-foot cut-off, NorthStar shall remove the portion that is above the 4-foot cut-off and shall be permitted to leave in place the portion that is deeper than the 4-foot cut-off.

(1) Structures that are more than 4 feet below ground surface may remain in place only if: (1) no residual radioactivity in the structures exceeds the residual radioactivity limits specified in Paragraph 5(c); (2) no non-radiological contamination in the structures exceeds the approved non-radiological remediation standards set forth in Appendix A of the I-Rule or other site specific remediation standard approved by ANR pursuant to the I-Rule; and (3) results of characterization of soil and groundwater in proximity of the structures do not exceed the approved non-radiological remediation standards set forth in Appendix A of the I-Rule. Buried piping and enclosed structural chambers that are more than 4 feet below ground surface may remain in place only after a survey demonstrates that any radiological contamination on the inner surfaces of such pipes and structures does not exceed the Derived Concentration Guideline Levels for 15 mrem/year from all pathways combined.

(2) Upon completion of decommissioning and site restoration of the VY Station site, NorthStar shall provide to ANR, VDH, and the Town of Vernon a comprehensive survey and site plan identifying the location and depth of all below-grade structures remaining at the site, and confirming that every remaining subsurface structure meets the release criteria described in this MOU. NorthStar shall record the comprehensive survey and site plan in the land records of the Town of Vernon and erect field monumentation on the VY Station site to provide notice of all remaining below-grade structures in a manner that does not impede future use of the site.

(3) NorthStar shall not use concrete or other materials from buildings or structures on the VY Station site as fill at the VY Station site, with the exception that concrete from the VY Station cooling tower structures and intake structure may be used as fill if: (1) it contains no reactor-derived radionuclides as distinguishable from background for the VY Station site pursuant to the material characterization process employed at the Yankee Rowe Nuclear Power Station for onsite reuse of backfill material; (2) any non-radiological contamination in that concrete does not exceed background soil concentrations identified in Appendix A of the I-Rule, or site-specific background concentrations approved by ANR pursuant to Appendix B of the I-Rule; and (3) the reuse of concrete is conducted in accordance with a corrective action plan approved by ANR pursuant to Subchapter 5 of the I-Rule.

(4) Surface and sub-surface soil excavated as part of demolition may be reused at the VY Station site only to the extent it complies with the approved radiological and non-radiological standards for the relevant survey unit area and the use is consistent with Section 35-512 of the I-Rule.

(5) NorthStar shall use (1) a “basement inventory model” to determine the amount of residual radioactivity that remains in any remaining below-grade

structures or building materials that will be used as backfill; and (2) the "resident farmer scenario" to model the potential exposure to residual radioactivity in the soil. NorthStar shall provide to VDH the results of the NRC's confirmatory surveys of: (1) surface soils, to ensure that site release criteria for the resident farmer scenario of the NRC-approved License Termination Plan ("LTP") are met; and (2) any structures that remain above grade, to ensure site release criteria for the building occupancy scenario of the NRC-approved LTP are met. NorthStar shall provide a copy to VDH and ANR of the work plan for the Final Status Survey for NRC License Termination.

h. NorthStar shall perform and pay for any on-site radiological monitoring analyses required by the NRC, and shall provide the results to VDH, ANR, and DPS. NorthStar shall perform and pay for all final survey status analyses required by the NRC and shall provide copies of any submissions to the NRC regarding the results of the final status survey analysis to VDH, ANR, and DPS.

i. NorthStar shall perform biannual radiological monitoring of groundwater (including both previously impacted and down gradient monitoring wells) for three years. A post-completion monitoring plan approved by NRC, VDH, and ANR will identify the sampling locations and analytical parameters specific to each location.

j. NorthStar agrees to perform regular and appropriate offsite radiological surveys consistent with industry-standard practices.

k. NorthStar shall work cooperatively with ANR and VDH to develop appropriate protocols related to non-radiological remediation and site restoration for information sharing, obtaining samples from onsite environmental media, conducting site visits and inspections, site characterization, remediation, site restoration, and notifications. These protocols must be acceptable to ANR and VDH, be made publicly available, and shall recognize that ANR and VDH must approve all work plans and testing protocols prior to implementation and retain authority over all determinations of compliance related to non-radiological site characterization and remediation, non-radiological site closure, and site restoration. NorthStar shall provide to VDH copies of all decommissioning radiological surveys and radiochemical analysis data provided to the NRC or maintained on site as required by NRC regulations. ANR and VDH shall have the right to obtain confirmatory measurements and sampling throughout decommissioning and site restoration, provided that it does not interfere with NorthStar's schedule. ANR and VDH agree to work expeditiously with NorthStar beginning immediately upon issuance of a PUC Order approving the terms and conditions of this MOU to develop and review the workplans necessary to facilitate NorthStar pre- and post-closing site restoration activities at the VY Station Site.

6. The Parties agree that, if the PUC allows Entergy and NorthStar to contribute the SRT assets into a segregated sub-account of the NDT, the State of Vermont shall be designated as a material beneficiary of that sub-account in accordance with Paragraph 7 of the MOU entered in Docket No. 7862. Entergy and NorthStar shall not make any contrary representations to or

requests of the NRC. Entergy and NorthStar shall not amend the existing Site Restoration Trust Agreement in any way that materially alters Section 4.01 of that Agreement; in accordance with that Section, the following conditions shall apply to requests for disbursement of SRT funds.

a. All distributions from the sub-account shall be used exclusively to pay for site restoration costs.

b. NorthStar VY shall initiate any disbursements from the sub-account by presenting a Site Restoration Certificate ("Certificate") to the trustee.

c. For the initial Certificate requesting disbursement from the sub-account, and for every subsequent Certificate requesting disbursement from the sub-account in which NorthStar VY is the payee, NorthStar VY will first present the Certificate to DPS.

d. DPS shall have a period of 30 calendar days from receipt of a Certificate to provide written objection to NorthStar VY. If no written objection is made, after the expiration of the 30-day period, NorthStar VY shall be permitted to present that Certificate to the trustee for payment.

7. NorthStar shall retain a cultural expert to assist in developing a cultural resource plan to be implemented by NorthStar during decommissioning and site restoration work at the VY Station site. NorthStar shall seek the input of the Elnu Abenaki and the Abenaki Nation of Mississquoi in developing that plan.

8. NorthStar agrees to collaborate with the stakeholders to establish an appropriate public engagement process regarding the decommissioning and restoration of the VY Station site, including exploration of forming a subcommittee of the existing Nuclear Decommissioning Citizens Advisory Panel for this purpose.

9. [*intentionally left blank*]

10. DPS, ANR, and VDH reserve all rights to retain advisors pursuant to applicable State of Vermont contracting procedures in support of the review processes identified in this MOU, including, without limitation, pursuant to 30 V.S.A. § 20, and 21 as related to retention of external financial accounting assistance in support of the financial reviews provided for herein. For purposes of this MOU, the review processes specified herein shall be deemed to qualify as a "proceeding" within the meaning of 30 V.S.A § 20(b) if not otherwise covered in § 20.

11. Every obligation by ANR and DPS to approve or act on any request by NorthStar shall be conditioned on NorthStar's compliance with its obligations, including its reporting, certification, payment and disclosure obligations under this MOU. In the case of the annual certifications required pursuant to Paragraph 2(h), failure to provide any certification within 10 days of it becoming due will result in a denial of requests for approvals or for release of funds, unless DPS determines there was good cause for the delay and NorthStar is exercising its best efforts to cure it. In the case of payment obligations pursuant to Paragraph 10, ANR

and DPS shall act on requests from NorthStar to the extent all non-disputed portions of any requests or charges pending at the time of the request are remitted within 30 days of becoming due or are subject to a petition timely submitted to the PUC pursuant to 30 V.S.A. § 21.

12. The AGO shall not take a position opposing or objecting to the Proposed Transaction at any evidentiary hearings or in any post-hearing filings made to the PUC in this Docket No. 8880. If the PUC issues an Order approving the terms and conditions of this MOU substantially in their entirety, incorporating them as terms and conditions of the Order substantially in their entirety without any material alterations, additions, or rejections, and taking such actions as in the PUC's judgment are necessary or advisable in connection with the resolution of the Joint Petition, including granting the elements of relief identified in Paragraph 1, the AGO shall not take any action to stay, challenge, appeal, or move to reconsider such an Order.

13. In the event that the PUC issues an order that does not approve the Proposed Transaction, or has not issued an order by July 31, 2018 that approves the Proposed Transaction, incorporates the terms and conditions of this MOU substantially in their entirety, and does not contain terms or conditions that materially alter, materially add to, or materially reject what is provided for by the MOU, each Party agrees that any Party may withdraw from the MOU. If any Party so determines in its sole discretion under these circumstances to withdraw, it shall provide written notice within ten (10) days of July 31, 2018, or the date the PUC issues its order, whereupon the withdrawing Party shall not be bound by the terms or conditions of the MOU and shall be placed in the position that it occupied before entering into this MOU.

14. For purposes of this MOU, except as expressly stated herein, the Parties retain all authority and reserve all rights to take any actions authorized by law.

15. Nothing in this MOU shall be interpreted as prohibiting or restricting Entergy or NorthStar from complying with any requirements or orders of the NRC, or any obligation under the VY Station operating license. To the extent that Entergy or NorthStar would be required to obtain approval from the NRC in order to fulfill any obligation under this MOU, Entergy and/or NorthStar shall pursue such NRC approvals diligently and in good faith, and shall advance each related request by a date reasonably expected to be necessary to meet its obligations under this MOU.

16. Nothing in this MOU shall release Entergy, NorthStar, or any other party from the obligation to investigate and remediate releases of non-radiological hazardous materials in accordance with Chapter 159 of Title 10 of the Vermont Statutes Annotated and all regulations implementing Chapter 159 of Title 10.

17. Nothing in this MOU shall affect, restrict, or limit the jurisdiction or regulatory authority of any state or federal agencies over Entergy, NorthStar, or the VY Station site.

18. This MOU shall be governed by and construed in accordance with the laws of the State of Vermont. No suit or claim for relief shall be filed in any court or other tribunal or agency other than the PUC, Vermont Superior Court, or the U.S. District Court for the District of Vermont, unless the PUC, Vermont Superior Court, or the U.S. District Court for the District of Vermont lack subject matter jurisdiction over the suit or claim for relief. If none has

subject matter jurisdiction over the suit or claim for relief, the Parties reserve all rights regarding venues for the enforcement of any dispute arising under this MOU.

19. The Parties' obligations under this MOU are to be applied and enforced consistent with the plain meaning of the language used herein.

20. The Parties have made compromises on specific issues to reach this MOU. This MOU, and all orders approving and implementing provisions of this MOU shall not be construed by any party or tribunal as having precedential impact on any future proceedings involving the Parties, except in a proceeding to enforce the terms and conditions of this MOU.

21. Except as provided for in this MOU and as may expressly be modified by any PUC Order regarding the Proposed Transaction to be issued in Docket No. 8880, all other agreements, PUC orders, and MOUs remain in full force and effect. For example, as used in this MOU, the term "site restoration" may apply to the period of time during which radiological decommissioning is being conducted and/or prior to the time radiological decommissioning has been completed to the satisfaction of the NRC, and NorthStar may commence site restoration concurrently with radiological decommissioning. In addition, the AGO hereby provides its written consent to any modifications of obligations owed by Entergy to the AGO pursuant to the Docket No. 7862 Settlement Agreement, to the extent this MOU modifies those provisions.

22. The Parties shall negotiate in good faith the terms of necessary instruments to be filed with the appropriate tribunals necessary to accomplish the terms and conditions of this MOU. The Parties will cooperate in further PUC proceedings in this Docket and all Parties that have submitted testimony will sponsor testimony necessary to support this MOU. DPS will support issuance of the orders and findings of the PUC specified in Paragraph 1 of this MOU subject to DPS' obligations under Title 30 of the Vermont Statutes Annotated.

23. Entergy and NorthStar each covenant that each shall not individually or collectively assert or in any way suggest that federal regulatory authority pre-empts the PUC or any court of law from enforcing any commitment made by any Party in this MOU.

24. Each Party enters into this MOU freely and after opportunity for and actual consultation with all desired counsel, legal and otherwise, of its choice.

25. The Parties understand, agree, and acknowledge that (a) this MOU has been freely negotiated by all Parties; and (b) in any controversy, dispute or contest over the meaning, interpretation, validity, or enforceability of this MOU or any of its terms or conditions, there shall not be any inference, presumption, or conclusion drawn whatsoever against any Party by virtue of that Party having drafted this MOU or any portion thereof. The Parties agree that previous drafts, as well as verbal, electronic, or written communications related to the settlement negotiations of this MOU, shall not be used to interpret intent. The Parties further agree that all previous drafts, as well as verbal, electronic, or written communications related to the settlement negotiations of this MOU, were and must remain confidential and not admissible in any state or federal court or other tribunal.

26. Each Party to this MOU shall reasonably and in good faith cooperate in connection with this MOU, including by providing executed versions of documents reasonably requested in connection with carrying out the objectives of this MOU.

27. Each Party represents that it possesses the power and authority to execute, deliver and perform its obligations under this MOU, which obligations are valid, binding, and enforceable under this MOU.

28. This MOU shall be binding on, and inure to the benefit of, the respective successors and assigns of each Party to this MOU and, in any event, shall continue to be binding upon the Parties. Any Party may name a successor or assign its rights under this MOU by providing notice to and receiving consent from the other parties pursuant to Paragraph 29 of this MOU, such consent not to be unreasonably withheld.

29. Any notice given pursuant to this MOU shall be in writing and delivered by: hand (with mailed confirmation copy); receipted overnight delivery service; email (if acknowledged by a reply email from the recipient identified in this MOU); or mail, first class postage prepaid, with receipted delivery, to the other Party at the address set forth below:

If to DPS:

Commissioner
Vermont Department of Public Service
112 State Street - Drawer 20
Montpelier, VT 05620

With a copy to:

Director for Public Advocacy
Vermont Department of Public Service
112 State Street - Drawer 20
Montpelier, VT 05620

and a copy to:

Vermont Office of the Attorney General
109 State Street
Montpelier, VT 05609-1001

If to ANR:

Secretary
Vermont Agency of Natural Resources
1 National Life Drive, Davis 2
Montpelier, VT 05620-3901

With a copy to:

General Counsel
Vermont Agency of Natural Resources
1 National Life Drive, Davis 2
Montpelier, VT 05620-3901

and a copy to:

Vermont Office of the Attorney General
109 State Street
Montpelier, VT 05609-1001

If to VDH:

Commissioner
Vermont Department of Health
108 Cherry Street
Burlington, VT 05402

With a copy to:

Senior Policy and Legal Advisor
Vermont Department of Health
108 Cherry Street
Burlington, VT 05402

and a copy to:

Vermont Office of the Attorney General
109 State Street
Montpelier, VT 05609-1001

If to AGO:

Vermont Office of the Attorney General
109 State Street
Montpelier, VT 05609-1001

If to Entergy:

Chief Nuclear Officer
Entergy Nuclear Operations, Inc.
1340 Echelon Parkway
Jackson, MS 30213

With a copy to:

General Counsel
Entergy Nuclear Operations, Inc.
639 Loyola Avenue
New Orleans, LA 70113

If to NorthStar:

Chief Executive Officer
NorthStar Group Services, Inc.
370 7th Avenue, Suite 1803
New York, NY 10001

With a copy to:

General Counsel
NorthStar Group Services, Inc.
35 Corporate Drive, Suite 1155
Trumbull, CT 06611

If to Elnu Abenaki Tribe:

Richard Holschuh
117 Fuller Drive
Brattleboro, VT 05301

If to Abenaki Nation of Missisquoi:

William J. Brotherton
Brotherton Law Firm
2340 FM 407, Suite 200
Highland Village, TX 75077

If to Windham Regional Commission:

Executive Director
Windham Regional Commission
139 Main Street, Suite 505
Brattleboro, VT 05301

If to New England Coalition on Nuclear Pollution, Inc.:

James Dumont
PO Box 229
Bristol, VT 05443

If to Town of Vernon Planning and Economic Development Commission:

David G. Carpenter
Facey Goss & McPhee PC
PO Box 578
Rutland, VT 05702

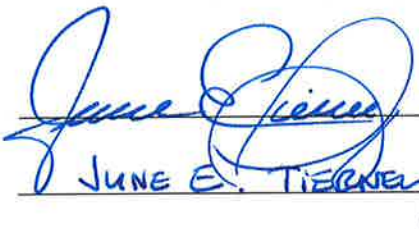
30. This MOU and any referenced Attachments hereto constitute the entire agreement between the Parties. This MOU shall not be changed, modified, or altered in any manner except by an instrument in writing executed by the Parties.

31. If any part of this MOU is determined not to be valid, such provision shall be null and void and the remainder of the MOU shall continue in full force and effect.

32. This MOU is effective as of March 2, 2018.

[Signature pages follow]

VERMONT DEPARTMENT OF PUBLIC SERVICE

By: 

Name: JUNE E. TIERNEY

Title: COMMISSIONER

Date: MARCH 2, 2018

VERMONT AGENCY OF NATURAL RESOURCES

By: Julia S. Moore

Name: Julia S. Moore

Title: Secretary

Date: 03/02/18

As to the terms of ¶¶ 1, 12, 13, 21, 22, 25-27 only and otherwise as to form:

VERMONT ATTORNEY GENERAL'S OFFICE

By: _____

Name: Thomas J. Donovan, Jr.

Title: A.G.

Date: 3/2/18

ENTERGY NUCLEAR VERMONT YANKEE, LLC

By: _____

Name: PAUL PARADIS

Title: PRESIDENT

Date: 3/2/18

ENTERGY NUCLEAR VERMONT INVESTMENT COMPANY, LLC

By: _____

Name: PAUL PARADIS

Title: PRESIDENT

Date: 3/2/18

ENTERGY NUCLEAR OPERATIONS, INC.

By: _____

Name: _____

Title: _____

Date: _____

ENTERGY NUCLEAR VERMONT YANKEE, LLC

By: _____

Name: _____

Title: _____

Date: _____

ENTERGY NUCLEAR VERMONT INVESTMENT COMPANY, LLC

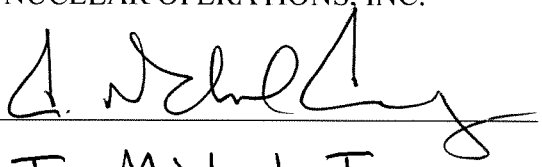
By: _____

Name: _____

Title: _____

Date: _____

ENTERGY NUCLEAR OPERATIONS, INC.

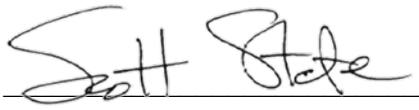
By: 

Name: T. Michael Twomey

Title: Vice President

Date: March 2, 2018

NORTHSTAR DECOMMISSIONING HOLDINGS, LLC

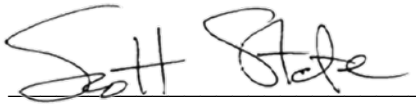
By: 

Name: Scott E. State

Title: CEO

Date: 3/1/2018

NORTHSTAR GROUP HOLDINGS, LLC

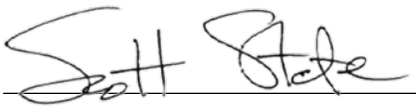
By: 

Name: Scott E. State

Title: CEO

Date: 3/1/2018

NORTHSTAR NUCLEAR DECOMMISSIONING COMPANY, LLC

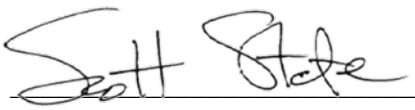
By: 

Name: Scott E. State

Title: CEO

Date: 3/1/2018

NORTHSTAR GROUP SERVICES, INC.

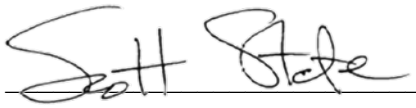
By: 

Name: Scott E. State

Title: CEO

Date: 3/1/2018

LVI PARENT CORP.

By: 

Name: Scott E. State

Title: CEO

Date: 3/1/2018

ELNU ABENAKI TRIBE

By: Richard Holschuh

Name: Richard Holschuh

Title: Appointed Liaison – Elnu Abenaki Tribe

Date: March 2, 2018

ABENAKI NATION OF MISSISQUOI

By: /s/ William J. Brotherton

Name: William J. Brotherton

Title: Counsel

Date: March 2, 2018

WINDHAM REGIONAL COMMISSION

By: _____

Name: L. Christopher Campany

Title: Executive Director

Date: March 2, 2018

NEW ENGLAND COALITION ON NUCLEAR POLLUTION, INC.

By: James Allen Dumont

Name: JAMES A DUMONT

Title: Attorney for NEC

Date: 3/2/18

TOWN OF VERNON PLANNING AND ECONOMIC DEVELOPMENT COMMISSION

By: Robert L. Spencer

Name: Robert L. Spencer

Title: Chair

Date: March 2, 2018

DRAFT

AIA® Document A312™ – 2010

Performance Bond

CONTRACTOR:
(Name, legal status and address)

« »« »
« »

SURETY:
(Name, legal status and principal place of business)

« »« »
« »

OWNER:
(Name, legal status and address)

« »« »
« »

CONSTRUCTION CONTRACT
Date: « »
Amount: $ « »
Description:
(Name and location)

« »
« »

BOND
Date:
(Not earlier than Construction Contract Date)
« »
Amount: $ « »
Modifications to this Bond: « » None « » See Section 16

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:	« »« »	Name and Title:	« »« »

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or **BROKER:**

« »
« »
« »

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

« »
« »
« »
« »
« »
« »

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

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User Notes: (2052737895)

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

.1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

.2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

.3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the

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User Notes: (2052737895)

Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and

.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

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User Notes: (2052737895)

§ 16 Modifications to this bond are as follows:

« »

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:	« »« »	Name and Title:	« »« »
Address:	« »	Address:	« »

DRAFT

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User Notes: (2052737895)

Irrevocable
Standby Letter of Credit No. _____

Beneficiary:

Applicant:

Date of Issue:

Date and Place of Expiry:

Amount:
Not Exceeding USD $25,000,000 Twenty-Five Million and 00/100 United States Dollars.

WE HEREBY ESTABLISH THIS IRREVOCABLE LETTER OF CREDIT IN FAVOR OF THE AFORESAID ADDRESSEES (EACH, THE "BENEFICIARY") FOR DRAWINGS UP TO UNITED STATES DOLLARS TWENTY-FIVE MILLION AND 00/100 EFFECTIVE IMMEDIATELY. THIS LETTER OF CREDIT IS ISSUED, PRESENTABLE AND PAYABLE AT [BANK NAME], [BANK ADDRESS] AND EXPIRES WITH OUR CLOSE OF BUSINESS ON _____.

THE TERM "BENEFICIARY" INCLUDES ANY SUCCESSOR BY OPERATION OF LAW OF EACH NAMED BENEFICIARY INCLUDING, WITHOUT LIMITATION, ANY LIQUIDATOR, REHABILITATOR, RECEIVER OR CONSERVATOR.

WE HEREBY UNDERTAKE TO PROMPTLY HONOR YOUR SIGHT DRAFT(S) DRAWN ON US, INDICATING OUR CREDIT NO. _____ FOR ALL OR PART OF THIS CREDIT IF PRESENTED AT OUR OFFICE SPECIFIED IN PARAGRAPH ONE ON OR BEFORE THE EXPIRY DATE OR ANY AUTOMATICALLY EXTENDED EXPIRY DATE. ANY ONE BENEFICIARY OR COMBINATION OF BENEFICIARIES, ACTING INDIVIDUALLY OR COLLECTIVELY, MAY DRAW ON THIS LETTER OF CREDIT IN FULL OR IN PART, AND ANY ACTION TAKEN BY ANY OR ALL BENEFICIARIES HEREUNDER SHALL BIND EACH OF THEM.

EXCEPT AS EXPRESSLY STATED HEREIN, THIS UNDERTAKING IS NOT SUBJECT TO ANY AGREEMENT, CONDITION OR QUALIFICATION. THE OBLIGATION OF [BANK] UNDER THIS LETTER OF CREDIT IS THE INDIVIDUAL OBLIGATION OF [BANK], AND IS IN NO WAY CONTINGENT UPON REIMBURSEMENT WITH RESPECT THERETO.

IT IS A CONDITION OF THIS LETTER OF CREDIT THAT IT IS DEEMED TO BE AUTOMATICALLY EXTENDED WITHOUT AMENDMENT FOR ONE YEAR FROM THE EXPIRY DATE HEREOF, OR ANY FUTURE EXPIRATION DATE, UNLESS AT LEAST THIRTY DAYS PRIOR TO ANY EXPIRATION DATE WE SHALL NOTIFY YOU BY REGISTERED MAIL THAT WE ELECT NOT TO CONSIDER THIS LETTER OF CREDIT RENEWED FOR ANY SUCH ADDITIONAL PERIOD.

THIS LETTER OF CREDIT IS SUBJECT TO AND GOVERNED BY THE LAWS OF THE STATE OF NEW YORK AND 2007 REVISION OF THE UNIFORM CUSTOMS AND PRACTICE FOR DOCUMENTARY CREDITS OF THE INTERNATIONAL CHAMBER OF COMMERCE (PUBLICATION 600) AND, IN THE EVENT OF ANY CONFLICT, THE LAWS OF THE STATE OF NEW YORK WILL CONTROL. IF THIS CREDIT EXPIRES DURING AN INTERRUPTION OF BUSINESS AS DESCRIBED IN ARTICLE 36 OF SAID PUBLICATION 600, THE BANK HEREBY SPECIFICALLY AGREES TO EFFECT PAYMENT IF THIS CREDIT IS DRAWN AGAINST WITHIN THIRTY (30) DAYS AFTER THE RESUMPTION OF BUSINESS.

[BANK NAME]

_____

NAME:
TITLE:

SUPPORT AGREEMENT BETWEEN
NORTHSTAR GROUP SERVICES, INC. AND
NORTHSTAR VERMONT YANKEE, LLC

THIS SUPPORT AGREEMENT (this "Agreement"), dated as of _____, 2018, is made by and between NorthStar Group Services, Inc., a Delaware corporation ("Parent"), and NorthStar Vermont Yankee, LLC a Delaware limited liability company f/k/a Entergy Nuclear Vermont Yankee, LLC (the "Subsidiary").

WITNESSETH:

WHEREAS, Parent is the indirect owner of 100% of the outstanding interests in the Subsidiary;

WHEREAS, the Subsidiary owns the Vermont Yankee Nuclear Power Station, located in Vernon, Vermont ("VYNPS"), Renewed Facility Operating License No. DPR-28 on the basis of which the Subsidiary and NorthStar Nuclear Decommissioning Company, LLC, a Delaware limited liability company, under the ownership of Parent, are authorized to own, possess maintain and decommission the VYNPS facilities and nuclear material (the "NRC License"); and

WHEREAS, Parent and the Subsidiary desire to take certain actions to assure the Subsidiary's ability to pay the expenses of maintaining and decommissioning VYNPS safely and protecting the public health and safety and to meet Nuclear Regulatory Commission ("NRC") requirements and State of Vermont requirements until the NRC License is terminated (the "NRC Requirements") and site restoration under state-law requirements is complete (the "Operating Costs").

NOW, THEREFORE, in consideration of the mutual promises herein contained and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. *Availability of Funding; Use of Proceeds*. From time to time, upon request of the Subsidiary, Parent shall provide or cause to be provided to the Subsidiary such funds as the Subsidiary determines to be necessary to pay the Operating Costs; provided, however, in any event the aggregate amount which Parent is obligated to provide under this Agreement shall not exceed $140 million.

2. *No Guarantee*. This Support Agreement is not, and nothing herein contained, and no action taken pursuant hereto by Parent shall be construed as, or deemed to constitute, a direct or indirect guarantee by Parent to any person of the payment of the Operating Costs or of any liability or obligation of any kind or character whatsoever of the Subsidiary. This Agreement may, however, be relied upon by the NRC in determining the financial qualifications of the Subsidiary to hold the NRC License.

3. *Waivers*. Parent hereby waives any failure or delay on the part of the Subsidiary in asserting or enforcing any of its rights or in making any claims or demands hereunder.

4. *Amendments and Termination*. This Agreement may not be amended or modified at any time without 30 days' prior written notice to the NRC and written notice to the Vermont Department of Public Service, the Vermont Agency of Natural Resources, and the Vermont Attorney General's Office. This Agreement shall terminate at such time as Parent or any affiliate is no longer the direct or indirect owner of any of the shares or other ownership interests in the Subsidiary. This Agreement shall also terminate with respect to the Operating Costs and the NRC Requirements applicable to VYNPS at such time as the NRC License is terminated for all areas of the VYNPS site and the Vermont Agency of Natural Resources has determined that site restoration is complete.

5. *Successors*. This Agreement shall be binding upon the parties hereto and their respective successors and assigns.

6. *Third Parties*. Except as expressly provided in Sections 2 and 4 with respect to the NRC and the State of Vermont, this Agreement is not intended for the benefit of any person other than the parties hereto, and shall not confer or be deemed to confer upon any other such person any benefits, rights, or remedies hereunder.

7. *Governing Law*. This Agreement shall be governed by the laws of the State of Delaware.

8. *Subsidiary Covenants*. The Subsidiary shall take no action to (a) cause Parent, or its successors and assigns, to void, cancel or otherwise modify its $140 million support commitment hereunder; (b) cause Parent to fail to perform its commitments hereunder or (c) impair Parent's performance hereunder, or remove or interfere with the Subsidiary's ability to draw upon Parent's commitment, in each case, without the prior written consent of the NRC's Director of the Office of Nuclear Reactor Regulation. Further, the Subsidiary shall inform the NRC in writing any time that it draws upon the $140 million commitment.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed and delivered by their respective officers thereunto duly authorized as of the day and year first above written.

NorthStar Group Services, Inc.

By:
Name:
Title:

NorthStar Vermont Yankee, LLC

By:
Name:
Title:

PROGRAM SUMMARY

Description	Zurich Environmental (Steadfast Insurance Company) (Non-Admitted)
Policy Term	Nine (9) Year Term
Policy Limit Options - Per claim and aggregate	**Primary (Zurich):** $25,000,000 per claim/aggregate $50,000 Crisis Management Expense Aggregate $50,000 Green Remediation Aggregate $50,000 Green Standards Aggregate **Excess (Beazley):** $5,000,000 aggregate (excess of $25,000,000)
Defense Expense	Included in the limit of liability
Deductible	$1,000,000 each pollution event deductible
Retroactive Dates	N/A
Total Program Cost (Flat Premium)	[redacted]
TRIA	1% Additional Premium
Additional Surplus Lines Tax/Fees	• VT State Surplus Lines Tax: 3% of gross premium and insurer fees only • VT Stamping Fee: 0
New Day Policy Fee	Waived *Note: Can be waived if Alliant Insurance Services executes the surplus lines filings.*

CONNECTICUT RIVER (VERNON POND)
FLOW

SLOPE 2:1
SLOPE 2:1
SLOPE 2:1

CLEAN WORKSHOP
ELF
CONSTRUCTION OFFICE BUILDING
COB WELL
CONTAINMENT ACCESS BUILDING
RADWASTE SURGE TANK
RADWASTE TANKS
SLOPE 1.5:1
SLOPE 1.5:1
RADWASTE BUILDING
EL. 227.6'
EL. 223.0'
REACTOR BUILDING
EL. 207.75'
EL. 201.75'
EL. 201.75'
EL. 207.75'
FOUNDATIONS ON BEDROCK
A.O.G. BUILDING
CONDENSATE STORAGE TANK
DEMINERALIZED WATER TANK
MAINTENANCE SHOP
SOUTH WAREHOUSE
CONTROL ROOM BUILDING
EL. 222.0'
EL. 203.0'
EL. 204.5'
EL. 204.6'
EL. 214.0'
TURBINE BUILDING
EL. 203.0'
EL. 204.5'
EL. 204.6'
SLOPES 204.6' TO 221.5'
SLOPE 1.5:1
SLOPE 1.5:1
SLOPE 1.5:1
SLOPE 1.5:1
SLOPE 1.5:1
SLOPE 1.5:1
EL. 204.0'
ADMINISTRATION BUILDING
NORTH WAREHOUSE
WAREHOUSE
SOUTHWEST WELL
COOLING TOWERS
COOLING TOWERS

LEGEND

- GZ-23S — MONITORING WELL INSTALLED BY GZA
- EW-2 — EXTRACTION WELL INSTALLED BY GZA
- SOUTHWEST WELL — BEDROCK WATER SUPPLY WELL
- 3201 — OTHER VERMONT YANKEE MONITORING WELL
- B103A — HISTORIC SOIL BORING
- PRE-CONSTRUCTION SURFACE TOPOGRAPHY CONTOUR IN FEET
- CONSTRUCTION EXCAVATION BOUNDARIES AND SLOPES

NOTES:

1. BASE PLAN, INCLUDING SITE SURFACE TOPOGRAPHY, PROVIDED TO GZA IN ELECTRONIC FORMAT BY VERMONT YANKEE.
2. THE LOCATIONS AND REFERENCE ELEVATIONS OF MONITORING WELLS AND ONSITE WATER SUPPLY WELLS WERE SURVEYED BY SOUTHERN VERMONT ENGINEERING OF BRATTLEBORO VERMONT. LOCATIONS OF OTHER WATER SUPPLY WELLS BASED ON FIELD OBSERVATIONS.
3. THE PRE-CONSTRUCTION SURFACE TOPOGRAPHY CONTOURS WERE APPROXIMATELY LOCATED FROM A PLAN ENTITLED "CONTACT DRAWING - FOUNDATION INVESTIGATION - SHEET 1" DEVELOPED BY EBASCO SERVICES INCORPORATED NEW YORK, DATED 02-15-1967, ORIGINAL SCALE: 1"=50', PLAN G-191434.
4. THE EXCAVATION BOUNDARIES AND SLOPES WERE APPROXIMATELY LOCATED FROM A PLAN ENTITLED "PLANT AREA EXCAVATION PLAN" DEVELOPED BY EBASCO SERVICES INC. NEW YORK, ORIGINAL DATE 13-15-1967, REVISION 2 DATED 8-25-1967, ORIGINAL SCALE 1"=30'. PLAN G-191437 AND A PLAN ENTITLED "SITE PLAN GRADING AND DRAINAGE" DEVELOPED BY ENERCON, REVISION DATE 9-21-2005, PLAN G-191443.

0 15' 30' 60' 90'
1 INCH = 30 FEET

ENTERGY VERMONT YANKEE

VERNON, VERMONT

PRE-CONSTRUCTION SURFACE TOPOGRAPHIC MAP

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com

PREPARED FOR: ENTERGY VERMONT YANKEE VERNON, VERMONT

PROJ. MGR.	REVIEWED BY:	CHECKED BY:	FIGURE
JRP	MMS	JRP	2.4
DESIGNED BY: MJDJAS	DRAWN BY: EMD	SCALE: 1" = 30'	
DATE: MAY 2011	PROJECT NO.: 09.0025576.11	REVISION NO.:	

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE USED, MODIFIED, REUSED, COPIED, OR MODIFIED IN WHOLE OR IN PART, FOR ANY OTHER PURPOSE OR PROJECT. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING SHALL BE AT THE USER'S OR OTHER SUCH PARTIES' SOLE RISK AND, WITHOUT ANY RISK OR LIABILITY TO GZA.

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APPENDIX E – REVISED SUPPORT AGREEMENT

SUPPORT AGREEMENT BETWEEN
NORTHSTAR GROUP SERVICES, INC. AND
NORTHSTAR VERMONT YANKEE, LLC

THIS SUPPORT AGREEMENT (this "Agreement"), dated as of , 2018, is made by and between NorthStar Group Services, Inc., a Delaware corporation ("Parent"), and NorthStar Vermont Yankee, LLC a Delaware limited liability company f/k/a Entergy Nuclear Vermont Yankee, LLC (the "Subsidiary").

W I T N E S S E T H:

WHEREAS, Parent is the indirect owner of 100% of the outstanding interests in the Subsidiary;

WHEREAS, the Subsidiary owns the Vermont Yankee Nuclear Power Station, located in Vernon, Vermont ("VYNPS"), Renewed Facility Operating License No. DPR-28 on the basis of which the Subsidiary and NorthStar Nuclear Decommissioning Company, LLC, a Delaware limited liability company, under the ownership of Parent, are authorized to own, possess maintain and decommission the VYNPS facilities and nuclear material (the "NRC License"); and

WHEREAS, Parent and the Subsidiary desire to take certain actions to assure the Subsidiary's ability to pay the expenses of maintaining and decommissioning VYNPS safely and protecting the public health and safety and to meet Nuclear Regulatory Commission ("NRC") and State of Vermont requirements until the NRC License is terminated and site restoration under state-law requirements is complete (collectively, the "Decommissioning Costs").

NOW, THEREFORE, in consideration of the mutual promises herein contained and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. *Availability of Funding; Use of Proceeds.* From time to time, upon request of the Subsidiary, Parent shall provide or cause to be provided to the Subsidiary such funds as the Subsidiary determines to be necessary to pay the Decommissioning Costs; provided, however, in any event the aggregate amount which Parent is obligated to provide under this Agreement shall not exceed $140 million.

2. *No Guarantee to Third Parties.* ~~This~~Without limiting the obligation set forth in paragraph 1, this Support Agreement is not, and nothing herein contained, and no action taken pursuant hereto by Parent shall be construed as, or deemed to constitute, a direct or indirect guarantee by Parent to any third party (other than the NRC and the Vermont Public Utility Commission) of the payment of the Decommissioning Costs or of any liability or obligation of any kind or character whatsoever of the Subsidiary. This Agreement may, however, be relied upon by the NRC as a parental guarantee in determining the financial qualifications of the Subsidiary to hold the NRC License, including funding the costs associated with the spent fuel management program, and by the ~~State of~~ Vermont ~~in~~

~~approving~~Public Utility Commission as a parental guarantee in determining financial assurance for the completion of decommissioning and site restoration.

3. *Waivers.* Parent hereby waives any failure or delay on the part of the Subsidiary in asserting or enforcing any of its rights or in making any claims or demands hereunder.

4. *Amendments and Termination.* This Agreement may not be amended or modified at any time without 30 days' prior written notice to the NRC, the Vermont Department of Public Service, the Vermont Agency of Natural Resources, and the Vermont Attorney General's Office. This Agreement shall terminate at such time as Parent or any affiliate is no longer the direct or indirect owner of any of the shares or other ownership interests in the Subsidiary. This Agreement shall also terminate with respect to the Decommissioning Costs at such time as the NRC License is terminated for all areas of the VYNPS site and the Vermont Agency of Natural Resources has determined that site restoration is complete.

5. *Successors.* This Agreement shall be binding upon the parties hereto and their respective successors and assigns.

6. *Third Parties.* Except as expressly provided in Sections 2 and 4 with respect to the NRC, the Vermont Public Utility Commission, the Vermont Department of Public Service, the Vermont Agency of Natural Resources, and the ~~State of~~ Vermont Attorney General's Office, this Agreement is not intended for the benefit of any person other than the parties hereto, and shall not confer or be deemed to confer upon any other such person any benefits, rights, or remedies hereunder.

7. *Governing Law.* This Agreement shall be governed by the laws of the State of Delaware.

8. *Subsidiary Covenants.* The Subsidiary shall take no action to (a) cause Parent, or its successors and assigns, to void, cancel or otherwise modify its $140 million support commitment hereunder; (b) cause Parent to fail to perform its commitments hereunder or (c) impair Parent's performance hereunder, or remove or interfere with the Subsidiary's ability to draw upon Parent's commitment, in each case, without the prior written consent of the NRC's Director of the Office of Nuclear Reactor Regulation. Further, the Subsidiary shall inform the NRC in writing any time that it draws upon the $140 million commitment.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed and delivered by their respective officers thereunto duly authorized as of the day and year first above written.

NorthStar Group Services, Inc.

By:

Name:
Title:

NorthStar Vermont Yankee, LLC

By:

Name: Scott E. State
Title:

Document comparison by Workshare 9 on Monday, July 02, 2018 10:14:38 AM

Input:	
Document 1 ID	file://C:\Users\ellitiawatson\Desktop\parent support agreement v1.docx
Description	parent support agreement v1
Document 2 ID	file://C:\Users\ellitiawatson\Desktop\parent support agreement v2.docx
Description	parent support agreement v2
Rendering set	Standard no moves

Legend:	
Insertion	
~~Deletion~~	
~~Moved from~~	
Moved to	
Style change	
Format change	
~~Moved deletion~~	
Inserted cell	
Deleted cell	
Moved cell	
Split/Merged cell	
Padding cell	

Statistics:	
	Count
Insertions	10
Deletions	8
Moved from	0
Moved to	0
Style change	0
Format changed	0
Total changes	18

PUC Case No. 8880 - SERVICE LIST

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CONFIDENTIAL

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 39
PARTY: OPC
DESCRIPTION: TRC White Paper -
CONFIDENTIAL DN. 03533-2020

Docket No. 20190140-EI
Cross-Examination
Hearing Exhibit

Exhibit No.: 4

Proffered by: Public Counsel

Short title: _____

Witness(s): _____

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 40
PARTY: OPC
DESCRIPTION: NRC Amendment to Operating License

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

ADP CR3, LLC

DUKE ENERGY FLORIDA, LLC

DOCKET NO. 50-302

CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 258
License No. DPR-72

1. The Nuclear Regulatory Commission (the Commission) having found that:

   A. The application for amendment by Duke Energy Florida, LLC (herein "DEF") (the owner), dated June 14, 2019, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter 1; the NRC subsequently approved the transfer of licensed responsibility for the Crystal River Unit 3 Nuclear Generating Plant (herein "the facility" or "CR3") to ADP CR3, LLC (herein "ADP CR3"), on March Date, 2020;

   B. Construction of CR3 has been substantially completed in conformity with Provisional Construction Permit No. CPPR-51 and the application, as amended, the provisions of the Act and the rules and regulations of the Commission;

   C. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;

   D. There is reasonable assurance: (i) that the activities authorized by this operating license can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the rules and regulations of the Commission;

   E. ADP CR3 is technically qualified and financially qualified to engage in the activities authorized by this operating license in accordance with the rules and regulations of the Commission;

   F. DEF has satisfied the applicable provisions of 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements," of the Commission's regulations;

   G. The issuance of this operating license will not be inimical to the common defense and security or to the health and safety of the public;

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H. The issuance of Facility Operating License No. DPR-72 subject to the conditions for protection of the environment set forth herein is in accordance with 10 CFR Part 51, (formerly Appendix D to 10 CFR Part 50), of the Commission's regulations and all applicable requirements have been satisfied;

I. The receipt, possession, and use of source, byproduct and special nuclear material as authorized by this license will be in accordance with the Commission's regulations in 10 CFR Part 30, 40 and 70, including 10 CFR Sections 30.33, 40.32, 70.23 and 70.31.

2. Facility Operating License No. DPR-72, issued to the licensee, is hereby amended in its entirety to read as follows:

A. This amended license applies to the Crystal River Unit 3 Nuclear Generating Plant, a pressurized water nuclear reactor and associated equipment (the facility), which is possessed, maintained, and decommissioned by ADP CR3, and owned by DEF, with the exception of the Independent Spent Fuel Storage Installation and its associated equipment, the special nuclear material configured as reactor fuel, high level and GTCC waste and the containers in which it is stored, which are owned but not possessed by ADP SF1, LLC (herein "ADP SF1"). The facility is located on the Gulf of Mexico, about seven and one-half miles northwest of the town of Crystal River, Citrus County, Florida, and is described in the "Defueled Safety Analysis Report" as supplemented and amended and the Environmental Report as supplemented and amended.

B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses:

(1) ADP CR3, pursuant to Section 104b of the Act and 10 CFR Part 50, "Licensing of Production and Utilization Facilities," to possess, maintain, and decommission the facility at the designated location in accordance with the procedures and limitations set forth in this license;

(2) DEF, pursuant to Section 104b of the Act and 10 CFR Part 50, "Licensing of Production and Utilization Facilities," to possess the facility at the designated location in accordance with the procedures and limitations set forth in this license;

(3) ADP CR3, pursuant to the Act and 10 CFR Part 70, to possess at any time special nuclear material configured as reactor fuel, in accordance with the limitations for storage as described in the Defueled Safety Analysis Report, as supplemented and amended;

(4) ADP CR3, pursuant to the Act and 10 CFR Parts 30, 40 and 70 to possess at any time any byproduct, source and special nuclear material as sealed neutron sources used previously for reactor startup, as fission detectors, and sealed sources for reactor instrumentation and to possess and use at any time any byproduct, source, and special nuclear material as sealed sources for radiation monitoring equipment calibration in amounts as required;

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(5) ADP CR3, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components;

(6) ADP CR3, pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not separate, such byproduct and special nuclear materials as were produced by the prior operation of the facility;

(7) ADP CR3, pursuant to the Act and 10 CFR Parts 30 and 70, to receive and possess, but not separate, that byproduct and special nuclear materials associated with four (4) fuel assemblies which were previously irradiated in the Oconee Nuclear Station, Unit No. 1 (B&W Identification Numbers 1A-01, 04, 05 and 36).

C. This license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Section 50.54 and 50.59 of Part 50, Section 70.32 of Part 70; and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Deleted per Amendment No. 247

(2) Technical Specifications

The Technical Specifications contained in Appendix A are hereby replaced with the Permanently Defueled Technical Specifications (PDTS). ADP CR3 shall maintain the facility in accordance with the Permanently Defueled Technical Specifications, as revised through Amendment No. 258.

(3) Deleted per Amendment No. 247

(4) Deleted per Amendment No. 20 dated 7-3-79

(5) Deleted per Amendment No. 247

(6) Deleted per Amendment No. 21, 7-3-79

(7) Deleted per Amendment No. 247

(8) Deleted per Amendment No. 247

(9) Deleted per Amendment No. 247

(10) Deleted per Amendment No. 247

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(11) Deleted per Amendment No. 247

(12) Deleted per Amendment No. 237

(13) Deleted per Amendment No. 229

(14) Deleted per Amendment No. 255

(15) Deleted per Amendment No. 247

(16) The financial Support Agreement between NorthStar Group Services, Inc. and ADP CR3 and ADP SF1 in the amount of $105 million, and the financial Support Agreement between Orano USA LLC and ADP CR3 and ADP SF1 in the amount of $35 million, to assure the ability of ADP CR3 and ADP SF1 to pay the expenses of: (i) maintaining and decommissioning the CR-3 facility and ISFSI safely; (ii) protecting the public health and safety; and (iii) meeting NRC requirements, are effective. These Support Agreements may not be voided, canceled, or modified without the prior written consent of the NRC staff. The Director of the Office of Nuclear Material Safety and Safeguards shall be informed, in writing, no later than 10 working days after any funds are provided under the terms of the Support Agreements.

(17) ADP CR3 shall establish a Provisional Trust consistent with Section 3.14 of the "Decommissioning Services Agreement by and between Duke Energy Florida, LLC, as Company and ADP CR3, LLC, as Contractor and ADP SF1, LLC, as Buyer Dated as of May 29, 2019" (DSA). The Provisional Trust will be initially funded with $20 million. ADP CR3 will retain six percent of each invoice for decommissioning services performed and paid from the nuclear decommissioning trust and deposit those amounts into the Provisional Trust to fund and maintain the Provisional Trust at $50 million until the ISFSI-Only Interim End-State Conditions, as defined in the DSA, are achieved.

(18) ADP CR3 shall provide financial assurance in a form and in an amount meeting the requirements of 10 CFR 72.30(e) to the ISFSI Decommissioning Trust established under Section 3.15 of the DSA. The ISFSI Decommissioning Trust shall be established to hold the financial assurance until the End-State Conditions, as defined in the DSA, are achieved.

(19) ADP CR3 must ensure that a performance bond is obtained if a settlement agreement with the U.S. Department of Energy (DOE) on DOE reimbursements for spent fuel management expenses is not entered into by January 1, 2025. The performance bond will be effective January 1, 2025, initially in an amount equal to one year's worth of spent fuel management expenses. ADP CR3 will thereafter ensure that a performance bond is maintained for subsequent years, in the amount of the applicable estimated annual expense, until a settlement agreement with the DOE is entered into.

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(20) ADP CR3 must ensure that:

The NorthStar Group Services, Inc. (NorthStar) Member Representative of Accelerated Decommissioning Partners, LLC (ADP) (NorthStar Member Representative) has the responsibility and exclusive authority to ensure and shall ensure that the business and activities of ADP CR3 and ADP SF1 with respect to the CR3 license is at all times conducted in a manner consistent with the public health and safety, and common defense and security of the United States.

The NorthStar Member Representative, and any Chief Executive Officer (CEO) or Chief Nuclear Officer (CNO) of ADP or ADP CR3 appointed by NorthStar to serve in such office, shall be a U.S. citizen.

The licensee shall not approve or take any action involving matters necessary to ensure U.S. control without the approval of NorthStar. This includes any matters relating to nuclear safety, security, or reliability, the appointment of any CEO and CNO, and any successor thereof, or any other issue reasonably determined by NorthStar in its prudent exercise of discretion.

Changes to the ADP CR-3, LLC Negation Action Plan may only be made upon recommendation of ADP CR3's CEO and approval by NorthStar. Any proposed change resulting in a decrease in the effectiveness of the plan will not be implemented without prior NRC approval. ADP CR3 will provide the NRC with 30 days prior written notice before the implementation of any material changes to the negation measures in the Limited Liability Agreement of Accelerated Decommissioning Partners, LLC dated February 7, 2017 (ADP LLC Agreement).

If at any time NorthStar is not required to have exclusive authority to approve any of the actions in Section 11.4(a) of the ADP LLC Agreement, any amendments to Section 11.4(a) must comply with applicable law, including Foreign Ownership, Control, or Domination requirements, and must be approved by the NRC.

D. Physical Security

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to 10 CFR 72.212(b)(9) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, which contain Safeguards Information protected under 10 CFR 73.21, is entitled: "Independent Spent Fuel Storage Installation Security Plan, Training and Qualification Plan, and Safeguards Contingency Plan", Revision 0, submitted by letter dated July 5, 2017.

E. Deleted per Amendment No. 247

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F. In accordance with the requirement imposed by the October 8, 1976, order of the United States Court Appeals for the District of Columbia Circuit in Natural Resources Defense Council v. Nuclear Regulatory Commission, No. 74-1385 and 74-1586, that the Nuclear Regulatory Commission "shall make any licenses granted between July 21, 1976 and such time when the mandate is issued subject to the outcome of the proceedings herein," the license issued herein shall be subject to the outcome of such proceedings.

G. This amended license is effective as of the date of issuance. Facility Operating License No. DPR-72, as amended, shall expire at midnight, December 3, 2016. *Amdt. #97 March 31, 1987*

DEF submitted the 10 CFR 50.82(a)(1) notification to the Nuclear Regulatory Commission on February 20, 2013. Per 10 CFR 50.51(b), the Facility Operating License No DPR-72 continues in effect until the Commission notifies the licensee that the License has been terminated.

FOR THE NUCLEAR REGULATORY COMMISSION

Original Signed by

Roger S. Boyd, Director
Division of Project Management
Office of Nuclear Reactor Regulation

Attachments:
Appendices A & B - Technical Specifications

Date of Issuance: Jan 28 1977

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Docket No. 20190140-EI
Cross-Examination
Hearing Exhibit

Exhibit No.: 29

Proffered by: Public Counsel

Short title: _____

Witness(s): _____

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 41
PARTY: OPC
DESCRIPTION: Hobbs LFDE

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Cc:	Daniel Hernandez; Melanie B. Senosiain; "Dianne.Triplett@duke-energy.com"; "Matthew R. Bernier"; DEF-CR3; "FLRegulatoryLegal@duke-energy.com"; "Robert.Pickels@duke-energy.com"
Subject:	Docket No. 20190140-EI - Duke Energy Florida, LLC's Responses to Late-Filed Deposition Exhibits
Date:	Thursday, July 2, 2020 10:20:14 AM
Attachments:	20190140-EI - DEF"s Responses to Late-Filed Exhibits.pdf

Good morning,

On behalf of Duke Energy Florida, LLC, please find the attached responses of Terry Hobbs to the late-filed deposition exhibits, in Docket 20190140-EI.

Should you have any questions, please do not hesitate to reach out to Daniel Hernandez, Esq. (T: 813-227-8114; E: DHernandez@shutts.com).

Thank you.

Shutts

Leslie Riehle
Certified and Florida Registered Paralegal

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Please consider the environment before printing this email

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Duke Energy Florida, LLC to Approve Transaction with Accelerated Decommissioning Partners, LLC for Accelerated Decommissioning Services at the CR3 Facility, Transfer of Title to Spent Fuel, and Assumption of Operations of the CR3 Facility Pursuant to the NRC License, and Request for Waiver From Future Application of Rule 25-6.04365, F.A.C. for Nuclear Decommissioning Study	DOCKET NO.: 20190140-EI Dated: July 2, 2020

TERRY HOBBS RESPONSES TO LATE-FILED DEPOSITION EXHIBITS ON BEHALF OF DUKE ENERGY FLORIDA, LLC

Late filed Ex. 2 – ANI / NEIL Premium assessment. Please explain who will be responsible for paying premium for each policy.

Article 14 of the DSA describes the insurance arrangement. In summary

- DEF will continue to maintain the nuclear insurance policies with NEIL and ANI
- Contractor and Buyer will be will be named as additional insureds
- DEF will pay the premiums and be entitled to any return premiums
- DEF will invoice ADP CR3 for the portion of the premiums related to the ISFSI assets from the Closing Date through reaching through reaching End-State Conditions
- ADP CR3 will pay any claim deductibles for damage they caused or Force Majeure
- DEF will pay for ADP CR3 supplemental environmental policy
- ADP CR3 will maintain transportation-related insurance

Late filed Ex. 3 – List of disbursements made from NDT between February 2013 and May 31, 2020.

1. License Termination $108.4M
2. Spent Fuel Management $191.4M
3. Site Restoration $7.5M

Late filed Ex. 4 – Explanation of difference between $131M and $90M recovery.

The decrease is related to the assumed total claim of approximately $131M and the guidance Duke Energy received from outside counsel on the amount we should assume we will receive from DOE in litigation which, in their opinion, is approximately $90M.

Late filed Ex. 5 – Project contingency estimate.

Estimated Uncertainty/Risk contingency is approximately 12.5%

Late filed Ex. 6 – Northstar financial condition analysis and peer comparison.

The subject matter experts verified that NorthStar's financial condition was in line with its peers but did not produce a report or analysis document.

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FLORIDA PUBLIC SERVICE COMMISSION
DOCKET: 20190140-EI EXHIBIT: 42
PARTY: OPC
DESCRIPTION: TRC PowerPoint 3.19.2019 - CONFIDENTIAL DN. 03533-2020