



Dianne M. Triplett
DEPUTY GENERAL COUNSEL

March 23, 2020

VIA ELECTRONIC FILING

Adam J. Teitzman, Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Re: Crystal River Unit 3 – DEF Annual Report to NRC; *Undocketed*

Dear Mr. Teitzman:

Pursuant to and in compliance with Rule 25-6.04365(6), F.A.C., please find attached for filing on behalf of Duke Energy Florida, LLC, (“DEF”), recent correspondence to the Nuclear Regulatory Commission (“NRC”) providing DEF’s Annual Decommissioning and Irradiated Fuel Management Financial Status Report and Decommissioning Funding Plan for Independent Spent Fuel Storage Installation for 2019.

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/cm
Attachment



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 50.82
10 CFR 50.75

March 19, 2020
3F0320-03

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Crystal River Unit 3 Annual Decommissioning and Irradiated Fuel Management
Financial Status Report for 2019

- References:
1. NRC to CR-3 letter dated March 13, 2013, "Crystal River Unit 3 Nuclear Generating Plant Certification of Permanent Cessation of Operation and Permanent Removal of Fuel from the Reactor" (ADAMS Accession No. ML13058A380)
 2. CR-3 to NRC letter dated December 2, 2013, "Crystal River Unit 3 – Post-Shutdown Decommissioning Activities Report" (ADAMS Accession No. ML13340A009)
 3. NRC to CR-3 letter dated January 26, 2015, "Crystal River Unit 3 Nuclear Generating Plant – Exemptions from the Requirements of 10 CFR Part 50, Sections 50.82(a)(8)(i)(A) and 50.75(h)(2)" (ADAMS Accession No. ML14247A545)
 4. NRC to CR-3 letter dated March 11, 2015, "Crystal River Unit 3 Nuclear Generating Plant Post-Shutdown Decommissioning Activities Report" (ADAMS Accession No. ML14321A751)
 5. CR-3 to NRC letter dated June 28, 2018, "Crystal River Unit 3 - 2018 Decommissioning Cost Estimate" (ADAMS Accession No. ML18178A181)
 6. CR-3 to NRC letter dated June 28, 2018, "Application for Order Consenting to Direct Transfer of Control of Licenses and Approving Conforming License Amendment" (ADAMS Accession Nos. ML19170A194, ML19170A195)

Dear Sir:

In accordance with 10 CFR 50.75(f)(1), 10 CFR 50.82(a)(8)(v), 10 CFR 50.82(a)(8)(vi), and 10 CFR 50.82(a)(8)(vii), Duke Energy Florida, LLC, (DEF) is submitting the annual status of decommissioning funding, status of funding for managing irradiated fuel, and the financial assurance status report for 2019. In Reference 1, the NRC acknowledged Crystal River Unit 3 Nuclear Generating Plant (CR-3) certification of permanent cessation of power operation and permanent removal of fuel from the reactor vessel. In Reference 2, DEF submitted its Post-Shutdown Decommissioning Activities Report (PSDAR) containing a site-specific Decommissioning Cost Estimate (DCE) pursuant to 10 CFR 50.82(a)(4)(i) and 10 CFR 50.82(a)(8)(iii). Accordingly, a status of decommissioning funding pursuant to 10 CFR 50.75(f)(1), a financial assurance status report pursuant to 10 CFR 50.82(a)(8)(v) and 10 CFR

50.82(a)(8)(vi), and a report on the status of the funding for managing irradiated fuel pursuant to 10 CFR 50.82(a)(8)(vii) are required to be submitted by March 31 of each year.

In Reference 3, the NRC provided its approval of the CR-3 exemption request to use the funds from the CR-3 Decommissioning Trust Funds for Irradiated Fuel Management and Site Restoration Costs. The financial assurance demonstration performed in this submittal has been prepared consistent with that exemption request. In Reference 4, the NRC found that the PSDAR contained the necessary information required by 10 CFR 50.82(a)(4)(i) and was consistent with the guidance of Regulatory Guide 1.185.

In Reference 5, DEF submitted an updated site-specific DCE that reflects current plant conditions, assumptions pertaining to the disposition of the nuclear unit and relevant industry experience in undertaking such projects. This update was performed at the request of Duke Energy management to verify sufficient funds remain to continue to demonstrate financial assurance and was not performed to satisfy any NRC regulation. The cash flows in this updated DCE are being used by DEF as the basis for demonstrating funding status in this Annual Decommissioning and Irradiated Fuel Management Financial Status Report, submitted pursuant to 10 CFR 50.75 (f)(1) and 10 CFR 50.82(a)(8)(v) – (vii).

In Reference 6, DEF submitted an Application for Order Consenting to Direct Transfer of Control of Licenses and Approving Conforming License Amendment. As of December 31, 2019, the effective date of this submittal, the NRC approval and Conforming License Amendment has not been implemented; therefore, the updated site-specific DCE (Reference 5) is being used by DEF as the basis for demonstrating funding status in this Annual Decommissioning and Irradiated Fuel Management Financial Status Report, submitted pursuant to 10 CFR 50.75 (f)(1) and 10 CFR 50.82(a)(8)(v) – (vii).

The attachments to this letter contain the information required by the above regulations for DEF. The report contains the following required information:

- (1) The amount of decommissioning funds estimated to be required pursuant to 10 CFR 50.75(b) and (c), (While DEF is identifying this amount because it is specified in 10 CFR 50.75(f)(1), it does not appear applicable to a plant that has permanently ceased operation, has submitted a site specific cost estimate, and is engaged in decommissioning.)
- (2) The amount of decommissioning funds accumulated to the end of the calendar year preceding the date of this report,
- (3) A schedule of annual amounts remaining to be collected,
- (4) The assumptions used regarding rates of escalation in decommissioning costs, rates of earnings on decommissioning funds, and rates of other factors used in funding projections,
- (5) Any contracts upon which the licensee is relying pursuant to 10 CFR 50.75(e)(1)(v),
- (6) Any modifications occurring to a licensee's current method of providing financial assurance since the last submitted report,
- (7) Any material changes to trust agreements or financial assurance contracts,
- (8) The amount spent on decommissioning, both cumulative and over the previous calendar year,
- (9) The remaining balance of any decommissioning funds,
- (10) The amount provided by other financial assurance methods being relied upon,

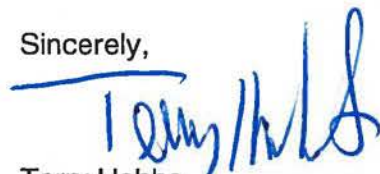
- (11) An estimate of the costs to complete decommissioning, reflecting any difference between actual and estimated costs for work performed during the year,
- (12) The decommissioning criteria upon which the estimate is based,
- (13) If the sum of the balance of any remaining decommissioning funds, plus earnings on such funds calculated are not greater than a 2 percent real rate of return, together with the amount provided by other financial assurance methods being relied upon, does not cover the estimated costs to complete the decommissioning, the financial assurance status report must include additional financial assurance to cover the estimated cost of completion,
- (14) The amount of funds accumulated to cover the cost of managing the irradiated fuel,
- (15) The projected cost of managing irradiated fuel until title to the fuel and possession of the fuel is transferred to the Secretary of Energy, and
- (16) If the funds accumulated do not cover the projected cost (of irradiated fuel), a plan to obtain additional funds to cover the cost.

The adjustment factors for labor rates and energy costs used in Item (1) for the calculation in 10 CFR 50.75(c)(2) are determined using the December 2019 indices from the U.S. Department of Labor, Bureau of Labor Statistics. The adjustment factor for the cost of low-level waste burial charges used in Item (1) for the calculation in 10 CFR 50.75(c)(2) is determined using NUREG-1307, Revision 17, "Report on Waste Burial Charges."

No new regulatory commitments have been made in this letter.

If you have any questions regarding this submittal, please contact Mr. Mark Van Sicklen, Licensing Lead, Nuclear Regulatory Affairs, at (352) 501-3045.

Sincerely,



Terry Hobbs
General Manager, Decommissioning

TDH/mvs

Attachments:

- Attachment 1 – Duke Energy Florida, Crystal River Unit 3 Funding Status Report
- Attachment 2 – Crystal River Unit 3, Estimate of Costs to Complete Decommissioning and Financial Assurance Demonstration

xc: NMSS Project Manager
Regional Administrator, Region I

DUKE ENERGY FLORIDA, LLC

**DOCKET NUMBERS 50 - 302 / 72-1035
LICENSE NUMBER DPR - 72**

ATTACHMENT 1

**CRYSTAL RIVER UNIT 3
FUNDING STATUS REPORT**

NRC Decommissioning Funding Status Report
 Report Dated as of December 31, 2019
 Duke Energy Florida
 Crystal River Unit 3
 100% Ownership

<u>Item #</u>		<u>Crystal River Unit 3</u>	
10 CFR 50.75(f)(1) - Status of decommissioning funding			
1	1a. The amount of decommissioning funds estimated to be required pursuant to 10 CFR 50.75(b) and (c);	\$ 478,109,208	
	1b. The amount of decommissioning funds estimated to be required for remaining License Termination costs.	\$ 755,730,023 ¹	
2	The amount of decommissioning funds accumulated to the end of the calendar year preceding the date of the report;	\$ 741,456,176 ^{2,3}	
3	A schedule of the annual amounts remaining to be collected;	None	
4	The assumptions used regarding rates of escalation in decommissioning costs, rates of earnings on decommissioning funds, and rates of other factors used in funding projections;	inflation	2.8% ⁴
		qualified rate of return	5.10% ⁴
5	Any contracts upon which the licensee is relying pursuant to paragraph 10 CFR 50.75(e)(1)(v);	None	
6	Any modifications occurring to a licensee's current method of providing financial assurance since the last submitted report; and	None	
7	Any material changes to trust agreements.	None	
10 CFR 50.82(a)(8)(v) - Financial assurance status report			
8	(A) The amount spent on decommissioning, both cumulative and over the previous calendar year,	\$ 14,338,956 ⁵	- Previous calendar year
		\$ 110,881,767 ⁶	- Cumulative
9	The remaining balance of any decommissioning funds, and	\$ 741,456,176 ^{2,3}	
10	The amount provided by other financial assurance methods being relied upon;	None	
11	(B) An estimate of the costs to complete decommissioning, reflecting any difference between actual and estimated costs for work performed during the year, and	See Attachment 2	
12	The decommissioning criteria upon which the estimate is based;	Unrestricted Release	
13	(C) Any modifications occurring to a licensee's current method of providing financial assurance since the last submitted report; and	None	
14	(D) Any material changes to trust agreements or financial assurance contracts.	None	
10 CFR 50.82(a)(8)(vi)			
15	If the sum of the balance of any remaining decommissioning funds, plus earnings on such funds calculated at not greater than a 2 percent real rate of return, together with the amount provided by other financial assurance methods being relied upon, does not cover the estimated cost to complete the decommissioning, the financial assurance status report must include additional financial assurance to cover the estimated cost of completion.	As demonstrated in Attachment 2, funds accumulated cover estimated cost of completion.	
10 CFR 50.82(a)(8)(vii) - Report on the status of funding for managing irradiated fuel			
16	(A) The amount of funds accumulated to cover the cost of managing the irradiated fuel;	As demonstrated in Attachment 2, funds accumulated cover estimated cost of completion.	
17	(B) The projected cost of managing irradiated fuel until title to the fuel and possession of the fuel is transferred to the Secretary of Energy; and	See Attachment 2	
18	(C) If the funds accumulated do not cover the projected cost, a plan to obtain additional funds to cover the cost.	As demonstrated in Attachment 2, funds accumulated cover projected cost of managing irradiated fuel.	

Attachment 1 Footnotes:

1 Total amount of License Termination costs in Attachment 2.

2 Amount is net of 2019 tax obligations.

3 Represents (a) the full fund balance of DEF's qualified and non-qualified decommissioning funds, which, in accordance with the NRC exemption request approval (ADAMS Accession No. 14247A545), can also be used for Spent Fuel Management and Site Restoration costs, and (b) 100% of the funds held by the City of Tallahassee on behalf of DEF, which pursuant to NRC order (ADAMS Accession No. ML020670117) will only be used for NRC radiological decommissioning.

4 Represents values approved by the Florida Public Service Commission in Order No. PSC-14-0702-PAA-EI, issued December 22, 2014, which became effective and final pursuant to Order No. PSC-15-0067-CO-EI, issued on January 23, 2015.

5 Represents the amount actually disbursed from the fund in calendar year 2019 for License Termination costs, not the costs incurred in calendar year 2019. Disbursed amounts in 2019 include costs incurred from October 2018 through October 2019. Outstanding license termination costs of \$745,221 for November 2019 and a credit of \$1,873,283 for December 2019 are expected after December 31, 2019.

6 Represents the cumulative amount actually disbursed from the fund as of December 31, 2019 for License Termination costs, not the cumulative costs incurred as of December 31, 2019. Outstanding license termination costs of \$745,221 for November 2019 and a credit of \$1,873,283 for December 2019 are expected after December 31, 2019.

DUKE ENERGY FLORIDA, LLC

**DOCKET NUMBERS 50 - 302 / 72-1035
LICENSE NUMBER DPR - 72**

ATTACHMENT 2

**CRYSTAL RIVER UNIT 3,
ESTIMATE OF COSTS TO COMPLETE DECOMMISSIONING AND
FINANCIAL ASSURANCE DEMONSTRATION**

**Crystal River Unit 3
Attachment 2 - Financial Assurance Demonstration
December 31, 2019**

	License Termination Cost (in thousands)	Spent Fuel Cost (in thousands)	Site Restoration Cost (in thousands)	Total Cost (in thousands)	Annual Earnings on Decommissioning Trust Fund at 2% (in thousands)	All Owners Decommissioning Trust Fund Year-End Balance (in thousands)
2019						741,456
2020	7,757	3,110	0	10,867	14,720	745,309
2021	7,735	3,188	0	10,923	14,797	749,183
2022	7,735	3,102	0	10,837	14,875	753,221
2023	7,735	3,102	0	10,837	14,956	757,340
2024	7,757	3,196	0	10,953	15,037	761,424
2025	7,735	3,102	0	10,837	15,120	765,707
2026	7,735	3,102	0	10,837	15,206	770,076
2027	7,735	3,188	0	10,923	15,292	774,445
2028	7,757	3,110	0	10,867	15,380	778,958
2029	7,735	3,102	0	10,837	15,471	783,592
2030	7,735	3,188	0	10,923	15,563	788,232
2031	7,735	3,102	0	10,837	15,656	793,051
2032	7,757	3,110	0	10,867	15,752	797,936
2033	7,735	3,188	0	10,923	15,849	802,862
2034	7,735	3,102	0	10,837	15,949	807,974
2035	7,735	3,102	0	10,837	16,051	813,188
2036	7,757	3,196	0	10,953	16,154	818,389
2037	7,735	8,320	0	16,056	16,207	818,540
2038	4,132	0	0	4,132	16,329	830,738
2039	4,132	86	0	4,218	16,573	843,092
2040	4,144		0	4,144	16,820	855,768
2041	4,132		0	4,132	17,074	868,710
2042	4,132		0	4,132	17,333	881,910
2043	4,132		0	4,132	17,597	895,375
2044	4,144		0	4,144	17,866	909,097
2045	4,132		0	4,132	18,141	923,105
2046	4,132		0	4,132	18,421	937,393
2047	4,132		0	4,132	18,707	951,967
2048	4,144		0	4,144	18,998	966,821
2049	4,132		0	4,132	19,295	981,984
2050	4,132		0	4,132	19,598	997,450
2051	4,132		0	4,132	19,908	1,013,225
2052	4,144		0	4,144	20,223	1,029,304
2053	4,132		0	4,132	20,545	1,045,716
2054	4,132		0	4,132	20,873	1,062,457
2055	4,132		0	4,132	21,208	1,079,532
2056	4,144		0	4,144	21,549	1,096,938
2057	4,132		0	4,132	21,897	1,114,703
2058	4,132		0	4,132	22,253	1,132,823
2059	4,132		0	4,132	22,615	1,151,306
2060	4,144		0	4,144	22,985	1,170,146
2061	4,132		0	4,132	23,362	1,189,375
2062	4,132		0	4,132	23,746	1,208,989
2063	4,132		0	4,132	24,138	1,228,995
2064	4,144		0	4,144	24,538	1,249,390
2065	4,132		0	4,132	24,946	1,270,204
2066	4,132		0	4,132	25,363	1,291,434
2067	27,098		448	27,546	25,553	1,289,441
2068	68,213		1,434	69,647	25,092	1,244,886
2069	133,736		1,678	135,414	23,544	1,133,016
2070	111,475		1,269	112,744	21,533	1,041,805
2071	90,745		888	91,633	19,920	970,092
2072	59,544		345	59,889	18,803	929,005
2073	5,549		27,540	33,089	18,249	914,166
2074	102		20,371	20,472	18,079	911,772
Total¹	\$755,730	\$61,693	\$53,972	\$871,395	\$1,041,711	

Attachment 2 Notes:

License Termination Cost - Reflects the License Termination cost portion of the Decommissioning Cost Estimate (DCE) escalated to 2019 dollars at the Consumer Price Index escalation rate of 2.5% for 2018 and 2.3% for 2019.

Spent Fuel Management Cost - Reflects the Spent Fuel Management cost portion of the Decommissioning Cost Estimate (DCE) escalated to 2019 dollars at the Consumer Price Index escalation rate of 2.5% for 2018 and 2.3% for 2019.

Site Restoration Cost - Reflects the Site Restoration cost portion of the Decommissioning Cost Estimate (DCE) escalated to 2019 dollars at the Consumer Price Index escalation rate of 2.5% for 2018 and 2.3% for 2019.

Total Cost - Reflects the sum of the License Termination, Spent Fuel Management and Site Restoration costs.

Projected Annual Earnings on Decommissioning Trust Fund at 2% - Reflects earnings on funds remaining in the trusts. Pursuant to 10 CFR 50.82(a)(8)(vi), a 2% real rate of return is used in his financial analysis. The earnings are calculated on the previous year's end-of-year fund balance (Column F) less 50% of the given year's annual expenses.

All Owners Decommissioning Trust Fund Year-End Balance - Reflects the end-of year fund balance of all funds after all projected earnings are added and projected expenditures are deducted. The 2019 end-of-year fund balance includes 100% of the \$7,300,493 in funds held by the City of Tallahassee on behalf of Duke Energy Florida, which pursuant to NRC order (ADAMS Accession No. ML020670117) will only be used for NRC radiological decommissioning.

For the purposes of demonstrating financial assurance in accordance with 10 CFR 50.82(a)(8)(vi), the methodology and assumptions in this analysis are consistent with the March 28, 2014, Request for Exemption from 10 CFR 50.82(a)(8)(i)(A) and 10 CFR 50.75(h)(2) (ADAMS Accession No. ML14098A037), which was approved by NRC on January 26, 2015 (ADAMS Accession No. ML14247A545).

¹ Total may not add due to rounding.



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 72.4
10 CFR 72.30(b)

March 19, 2020
3F0320-04

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Crystal River Unit 3 Decommissioning Funding Plan for Independent Spent Fuel Storage Installation

- References:
1. CR-3 to NRC letter dated June 28, 2018, "Crystal River Unit 3 - 2018 Decommissioning Cost Estimate" (ADAMS Accession No. ML18178A181)
 2. CR-3 to NRC letter dated June 28, 2018, "Application for Order Consenting to Direct Transfer of Control of Licenses and Approving Conforming License Amendment" (ADAMS Accession Nos. ML19170A194, ML19170A195)
 3. CR-3 to NRC letter dated March 19, 2020, "Crystal River Unit 3 Annual Decommissioning and Irradiated Fuel Management Financial Status Report for 2019"

Dear Sir:

In accordance with 10 CFR 72.30, Financial Assurance and Recordkeeping for Decommissioning, Duke Energy Florida, LLC (DEF) is submitting the Crystal River Nuclear Plant (CR-3) decommissioning funding plan for the Independent Spent Fuel Installation (ISFSI). 10 CFR 72.30(b) requires that "each holder of, or applicant for, a license under this part must submit for NRC review and approval a decommissioning funding plan"

In Reference 1, DEF submitted an updated site-specific Decommissioning Cost Estimate (DCE) that reflects current plant conditions, assumptions pertaining to the disposition of the nuclear unit and relevant industry experience in undertaking such projects. This update was performed at the request of Duke Energy management to verify sufficient funds remain to continue to demonstrate financial assurance and was not performed to satisfy any NRC regulation. The cash flows in this updated DCE are being used by DEF as the basis for demonstrating funding status for the Annual Decommissioning and Irradiated Fuel Management Financial Status Report, submitted pursuant to 10 CFR 50.75 (f)(1) and 10 CFR 50.82(a)(8)(v) – (vii) and the funding status for the Independent Spent Fuel Storage Installation (ISFSI).

In Reference 2, DEF submitted an Application for Order Consenting to Direct Transfer of Control of Licenses and Approving Conforming License Amendment. As of December 31, 2019, the NRC approval and Conforming License Amendment has not been implemented; therefore, the updated site-specific DCE (Reference 1) is being used by DEF as the basis for demonstrating funding status in this Decommissioning Funding Plan for Independent Spent Fuel Storage Installation, submitted pursuant to 10 CFR 72.30(b).

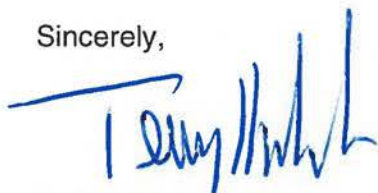
In Reference 3, DEF submitted the Annual Decommissioning and Irradiated Fuel Management Financial Status Report for 2019, filed concurrently with this report on March 19, 2020. Because these 10 CFR 72.30(b) reports rely on information contained in the 10 CFR 50.75(f)(1), 10 CFR 50.82(a)(8)(v), 10 CFR 50.82(a)(8)(vi) and 10 CFR 50.82(a)(8)(vii) decommissioning financial assurance reports, Duke Energy is submitting the reports under each regulation concurrently, with the same effective date of December 31, 2019.

Attachment 1 to this letter contains the information required by the above regulations for CR-3 ISFSI Decommissioning Funding Plan.

No new regulatory commitments have been made in this letter.

If you have any questions regarding this submittal, please contact Mr. Mark Van Sicklen, Licensing Lead, Nuclear Regulatory Affairs, at (352) 501-3045.

Sincerely,



Terry Hobbs
General Manager, Decommissioning

TDH/mvs

Attachment 1: Crystal River Unit 3 ISFSI Decommissioning Funding Plan

xc: NMSS Project Manager
Regional Administrator, Region I

DUKE ENERGY FLORIDA, LLC

**DOCKET NUMBERS 50 - 302 / 72-1035
LICENSE NUMBER DPR - 72**

ATTACHMENT 1

**CRYSTAL RIVER UNIT 3
ISFSI DECOMMISSIONING FUNDING PLAN**

Crystal River Unit 3 ISFSI Decommissioning Funding Plan

In accordance with 72.30(c), this decommissioning funding plan is being resubmitted with adjustments as necessary to account for changes in costs and the extent of contamination. This decommissioning funding plan updates the previous plan submitted on May 15, 2017 and specifically considers the effect of the following events on decommissioning costs:

- Spills of radioactive material producing additional residual radioactivity in onsite subsurface material.
- Facility modifications.
- Changes in authorized possession limits.
- Actual remediation costs that exceed the previous cost estimate.

The following statements specifically address the above events defined in 10 CFR 72.30(c). Since the submittal of the Decommissioning Funding Plan for the ISFSIs dated May 15, 2017:

1. No spills of radioactive materials producing additional residual activity in on-site subsurface material have occurred for Crystal River Nuclear Plant.
2. No facility modifications have had an effect on ISFSI decommissioning costs.
3. There were no changes in authorized possession limits for any of the sites.
4. No active decommissioning has occurred, thus there have not been any actual remediation costs that exceed the previous cost estimate.

The requirements of a decommissioning funding plan in 10 CFR 72.30(b) are provided below.

1. Information on how reasonable assurance will be provided that funds will be available to decommission the ISFSI or MRS.

10 CFR 72.30(c) requires a decommissioning funding plan be provided at least every three years and at the time of license renewal. Compliance with this part, together with the method of assuring funds described in Part 4 below, will provide reasonable assurance that funds will be available to decommission the CR-3 ISFSI.

2. A detailed cost estimate for decommissioning, in an amount reflecting:

- **The cost of an independent contractor to perform all decommissioning activities;**
- **An adequate contingency factor; and**
- **The cost of meeting the § 20.1402 of this chapter criteria for unrestricted use, provided that, if the applicant or licensee can demonstrate its ability to meet the provisions of § 20.1403 of this chapter, the cost estimate may be based on meeting the § 20.1403 criteria.**

The design and capacity of the CR-3 ISFSI is based upon the NUHOMS-32PTH1 Type 2-W spent fuel storage systems. 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 ISFSI consists of 40 HSM's with NUHOMS-32PTH1 Type 2-W DSCs that can house up to 32 spent fuel assemblies each. All CR-3 spent fuel is projected to be fully removed from the site in 2036.

Details of the NUHOMS spent fuel storage system, including physical dimensions, can be found in the proprietary version of the Final Safety Analysis Report for the Transnuclear NUHOMS, Docket Number 72-1004.

The methodology used to develop this detailed cost estimate follows the basic approach originally presented in the AIF/NESP-036 study report, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates."¹ The methodology includes elements for estimating distributed and undistributed costs. Distributed costs are activity specific and include planning and preparation costs as well as the decontamination, packaging, disposal and removal of components. Undistributed costs are typically time-dependent costs such as utility and decommissioning general contractor staff, property taxes, insurance, regulatory fees and permits, energy costs, and security staff. The methodology also uses 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.

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 this detailed cost estimate, contingency fulfills this role. Specifically, contingency is added to all costs at a constant 25% rate, consistent with the contingency evaluation criteria referenced by the NRC in NUREG-1757².

In addition, the detailed cost estimate is based on or includes the following:

- the expected ISFSI configuration after all spent fuel and some Greater-than-Class-C (GTCC) material has been removed from the site;
- the ISFSI pads not being contaminated, with only verification surveys to be performed;
- the costs necessary to terminate the ISFSI's NRC license and meet the §20.1402 criteria for unrestricted use;
- no remediation of contaminated (radiological) soil being required in order to terminate the site operating license;
- no expected interior or exterior radioactive surface contamination of the HSMs; and
- an allowance for module remediation of 6 modules that are assumed to have some level of neutron-induced activation after approximately 20 years of storage (i.e., to levels exceeding free-release limits). Controlled disposal costs are included for this allowance of concrete and steel.

¹ Atomic Industrial Forum, Inc., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986. This document is referenced in NRC's NUREG-1713, "Standard Review Plan for Decommissioning Cost Estimates for Nuclear Power Reactors."

² "Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. Nuclear Regulatory Commission's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Volume 3, Revision 1, February 2012

The cost to dispose of residual radioactivity, and verify that the remaining facility and surrounding environs meet the NRC's radiological limits established for unrestricted use, forms the basis of this cost estimate. Disposition of released material and structures is assumed to be outside the scope of this cost estimate.

A detailed breakdown of the cost to decommission the CR-3 ISFSI is provided in the table below. These costs were developed in conjunction with the 2018 Decommissioning Cost Analysis for CR-3 prepared by TLG Service, Inc. Costs were escalated using the 2018 and 2019 Consumer Price Index inflation factors of 2.5% and 2.3%, respectively.

Activity costs for ISFSI decommissioning are divided into 3 phases. The first phase covers initial planning during which the empty casks, ISFSI pads, and surrounding environs are characterized and the activity specifications and work procedures for the decontamination are developed. The next phase includes the cost of removal, packaging, transportation and disposal of the activated components, including supporting equipment, materials and supplies. The final phase includes the cost for the license termination survey, the verification survey, and the associated equipment and laboratory support. The cost estimate also includes costs for the NRC and NRC contractor reviews, CR-3's oversight staff, site security (industrial), and other site operating costs. The contents of the ISFSI are expected to be removed and transferred to the Department of Energy at the end of 2036; however, the ISFSI will not be promptly decommissioned. Instead, the decommissioning of the ISFSI and the power block structures will be synchronized. ISFSI decommissioning is expected to begin in 2073 and is estimated to occur in 120 days.

The methodology employed by TLG Services, Inc., does not assume that all decommissioning activities will be performed by an independent contractor. Because it would be impractical to identify the activities in the cost estimate that are assumed to be performed by an independent contractor, Duke has, as a conservative measure, applied a 20% markup to all costs in the estimate in order to determine the cost of an independent contractor to perform all decommissioning activities. This markup accounts for profit margin (15%) and risk premium (5%) in amounts consistent with what is applied in Duke Energy's Asset Retirement Obligation. This markup can be seen in the table below and is deemed appropriate because it is conservatively applied to all activity costs even though certain costs already account for performance by an independent contractor or are not activity costs (e.g., property taxes, insurance).

3. Identification of and justification for using the key assumptions contained in the DCE.

The assumptions and justification for those assumptions included in the CR-3 ISFSI decommissioning cost estimate are presented in the Section 2 above.

4. A description of the method of assuring funds for decommissioning from paragraph (e) of this section, including means for adjusting cost estimates and associated funding levels periodically over the life of the facility.

ISFSI decommissioning is included as a cost in the CR3 site-specific cost estimate submitted on June 28, 2018 (ML18178A181). Therefore, funding assurance for ISFSI decommissioning is provided by the Annual Decommissioning and Irradiated Fuel Management Financial Status Report, submitted in accordance with 10 CFR 50.75(f)(1), 10 CFR 50.82(a)(8)(v), 10 CFR 50.82(a)(8)(vi) and 10 CFR 50.82(a)(8)(vii) and filed concurrently with this report on March 19,

2020. The PSDAR does not include the costs associated with an independent contractor performing the work, as required by 10 CFR 72.30(b)(2)(i). The amount of surplus identified in the financial assurance demonstration is more than sufficient to fund the assumed additional third party markup costs.

In addition, Duke Energy is an electric utility and, as such, can rely solely on the external sinking fund in accordance with 10 CFR 72.30(e)(5). Cost estimates will be adjusted at least every three years and plans submitted to NRC as required by 10 CFR 72.30(c).

5. The volume of onsite subsurface material containing residual radioactivity that will require remediation to meet the criteria for license termination.

There is currently no known subsurface material containing residual radioactivity that will require remediation at decommissioning.

6. A certification that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning.

DEF hereby certifies that financial assurance for decommissioning the CR-3 ISFSI has been provided in the amount of the cost estimate for decommissioning using the methodology described in Part 4 above.

**Crystal River Unit 3 Nuclear Generating Plant
ISFSI Decommissioning Cost Estimate
(thousands of 2019 dollars)**

Activity Description	Removal	Packaging	Transport	Disposal	Other	Total	Waste Volume (cubic feet)	Craft Manhours	Oversight and Contractor Manhours
Decommissioning Contractor									
Planning (characterization, specs and procedures)	-	-	-	-	196.1	196.1	-	-	1,000
Decontamination (activated HSM disposition)	45.1	142.6	1,065.4	1,342.2		2,595.2	16,619	254	-
License Termination (radiological surveys)	-	-	-	-	1,091.6	1,091.6	-	8,241	-
Subtotal	45.1	142.6	1,065.4	1,342.2	1,287.7	3,882.9	16,619	8,495	1,000
Supporting Costs									
NRC and NRC Contractor Fees and Costs	-	-	-	-	369.1	369.1	-	-	776
Insurance	-	-	-	-	69.2	69.2	-	-	-
Property Taxes	-	-	-	-	146.8	146.8	-	-	-
Plant Energy Budget	-	-	-	-	35.7	35.7	-	-	-
Non-Labor Overhead	-	-	-	-	508.6	508.6	-	-	-
Corporate A&G	-	-	-	-	206.6	206.6	-	-	-
Florida LLRW Inspection Fee	-	-	-	-	33.6	33.6	-	-	-
Security Staff Cost	-	-	-	-	269.5	269.5	-	-	4,958
Oversight Staff Cost	-	-	-	-	257.9	257.9	-	-	3,761
Subtotal	-	-	-	-	1,896.9	1,896.9	-	-	9,495
Total (w/o contingency)	45.1	142.6	1,065.4	1,342.2	3,184.5	5,779.7	16,619	8,495	10,495
Total (w/25% contingency)	56.4	178.3	1,331.7	1,677.7	3,980.7	7,224.7			
Total (w/20% 3rd party markup)	67.6	213.9	1,598.0	2,013.3	4,776.8	8,669.6			