

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Fuel and purchased power cost recovery
clause with generating performance incentive
factor.

DOCKET NO. 20210001-EI
ORDER NO. PSC-2021-0466-FOF-EI
ISSUED: December 21, 2021

The following Commissioners participated in the disposition of this matter:

GARY F. CLARK, Chairman
ART GRAHAM
ANDREW GILES FAY
MIKE LA ROSA
GABRIELLA PASSIDOMO

ORDER APPROVING CRYSTAL RIVER UNIT 4 REPLACEMENT
POWER COSTS FOR DUKE ENERGY FLORIDA, LLC

BY THE COMMISSION:

BACKGROUND

As part of the continuing fuel and purchased power adjustment and generating performance incentive factor clause proceedings, an administrative hearing was held on November 2, 2021. At the hearing, certain stipulated issues for Duke Energy Florida, LLC (DEF or Company), Florida Power & Light Company (FPL), Florida Public Utilities Company (FPUC), Gulf Power Company (Gulf), and Tampa Electric Company (TECO), were approved by bench decision. We approved stipulations on all but one of the issues before us concerning each of the investor-owned utilities (IOUs) actual and projected fuel and capacity costs. The only issue left outstanding was Issue 1C, a company-specific issue with respect to DEF. More specifically, the subject matter of Issue 1C concerns the recoverability of replacement power costs associated with the January 2021 through April 2021 forced outage of Crystal River Unit No. 4 (CR4). CR4 is an approximately 715 megawatt (MW) coal-fired steam unit located in Citrus County, Florida. With regard to Issue 1C, we are being asked to determine if DEF's actions were reasonable and prudent with respect to the factors leading to the forced outage of CR4, and to determine if the associated replacement power costs are recoverable by the Company.

On November 15, 2021, DEF filed its brief on Issue 1C. The Florida Industrial Power Users Group (FIPUG), the Florida Retail Federation (FRF), the Office of Public Counsel (OPC), and White Springs Agricultural Chemicals, Inc. d/b/a PCS Phosphate – White Springs (PCS Phosphate) also filed a joint brief addressing Issue 1C on November 15, 2021.

We are vested with jurisdiction over the subject matter of this proceeding by the provisions of Chapter 366, Florida Statutes (F.S.), including Sections 366.04, 366.05, and 366.06, F.S.

DECISION

DEF argues that no adjustments are necessary with respect to replacement power costs associated with the January 2021 to April 2021 forced outage of CR4, and that these costs should be deemed fully recoverable. DEF asserts that the testimony and exhibits presented with respect to this matter clearly demonstrate that it could not have known that a highly-reliable plant component (a Beckwith manual sync check relay) failed, which was identified as a “root cause” of the outage. Further, even though operations procedures were changed as a result of the incident, it was not reasonably foreseeable for DEF to have planned for this unexpected failure of the manual sync check relay in advance of the incident.

FRF, FIPUG, OPC, and PCS Phosphate (Joint Intervenors) argue that DEF did not demonstrate that the actions which led to the forced outage of CR4 were reasonable and prudent, or that replacement power costs should be borne by DEF’s customers. Further, the DEF operating team at CR4 failed to follow established start up procedures and thereby damaged the plant when attempting to synchronize the generator to the electric grid. The Joint Intervenors argue that we should find that DEF failed to demonstrate that it acted prudently in operating CR4 with respect to the actions leading to the forced outage.

Analysis

In its brief, DEF states that the Company’s actions leading up to the CR4 outage were prudent and reasonable. DEF is requesting cost recovery of the replacement power costs associated with the CR4 outage. To calculate replacement power costs, DEF ran a simulation model that produced the total system costs assuming CR4 was fully available compared to actual system costs for the outage time period. The difference between the two costs represents the estimated system replacement power cost for the outage time period, which totals \$14.5 million (\$14.4 million retail). No party disputed the estimated system replacement power costs at the hearing.

The events leading up to the forced outage at CR4 occurred when the operator was attempting to synchronize the unit to the grid on December 17, 2020. Synchronization is a process by which the generating unit is connected to DEF’s power system by matching the generator’s electric parameters, such as, voltage, frequency, phase angle, and the power system’s electric parameters. It is important that the electric parameters of each are matched as closely as possible to avoid excessive torque placed upon the generator rotor, which could lead to machine damage. Standard Operating Procedure (SOP) at CR4 is to synchronize the unit to the grid in automatic mode; but, manual synchronization of the unit is permitted and has been done at CR4 before and after the outage event.

DEF’s operator unsuccessfully attempted to synchronize CR4 to the grid three times, using the automatic synchronization process. The operator’s subsequent actions resulted in an out-of-phase synchronization attempt of CR4 to the grid causing damage to the generator rotor and directly leading to the forced outage event. The unit remained in a forced outage status until all repairs and inspections to the generator had occurred. This event also caused a relay malfunction that tripped the Citrus Combined Cycle Power Block 1 (Citrus) station offline. Replacement power costs for Citrus are not at issue here.

Both DEF and the Joint Intervenors agree that the standard for review of prudence is what a reasonable utility manager would have done, in light of the conditions and circumstances that were known, or should have been known, at the time the decision was made. It is also clear that DEF has the burden of proof to meet this standard by providing credible evidence in the record.¹ The Joint Intervenors argue that DEF has not met this burden in this case.

In keeping with common industry practice, DEF performed a Root Cause Analysis (RCA) that explored the contributing factors of the event, the condition of the impacted unit, and corrective actions to prevent repeat occurrences. The RCA was performed by a team of DEF employees, including DEF witness Simpson. As determined by the RCA, the two root causes of the CR4 outage were: (1) the failure of the Beckwith Manual Sync Check Relay (relay) and (2) the operator's failure to follow proper operational procedures. The RCA also identified seven contributing causes related to training and communication issues that contributed to the outage.

The first root cause identified in the RCA was the failure of the protective relay. DEF witness Simpson described the relay as a highly reliable protective device, with an exceedingly low failure rate, designed to prevent the unit from attempting to synchronize to the grid in an out-of-phase condition. The relay was originally procured on February 28, 2002. The relay was then relocated to the CR4 unit and was last functionally tested in April 2020. DEF states the relay has no manufacturer published life expectancy or testing requirements; however, DEF maintains a six-year maintenance interval for protective devices, including the relay. DEF asserts that the relay was properly maintained and received regular calibrations before its failure in 2020. The evidence in the record reflects that the equipment was reasonably maintained and the failure of the relay was reasonably unforeseen by the Company. DEF contends that had this device performed as designed, the outage would not have occurred. Under such a scenario, the operator's actions would also have gone unnoticed. As DEF witness Simpson testified:

If he closed it at the correct time and the device was failed, we never would have known. Had he closed prematurely and the device had been good, this event wouldn't have happened. So when he closed early, the protective device failed to do its job, and that's what led to the event.²

The second root cause of the outage is the operator's failure to follow written operational procedures which led to the out-of-phase synchronization. In interviews conducted as part of the RCA, the operator was not attempting to synchronize in manual mode; but rather, was attempting to reset the synchronization circuit to permit automatic synchronization. According to the RCA, the operator did not follow proper procedures by attempting to reset the synchronization circuit to permit automatic synchronization. The proper written procedure would be to place the unit in a safe condition prior to repositioning the synchronization switch handle. The startup procedure manual states that, "If [a]uto synchronization is inoperable on [U]nit 4, then use manual sync listed in Enclosure 5."³ The procedure that the operator was attempting to perform was neither a manual synchronization nor automatic synchronization and was not Standard Operating

¹ *Florida Power Corp. v. Cresse*, 413 So. 2d 1187, 1191 (Fla. 1982) (the Court found that we properly imposed upon the utility the burden of showing that excess costs incurred were reasonable and were not the fault of management).

² TR 396-397.

³ Exhibit 8, Page 4.

Procedure for synchronization at CR4. The RCA states: “The operator understood the synchronizing relay would not allow an out-of-phase synchronization.”⁴ The operator’s understanding of the relay was based on past experience and training. Therefore, the evidence in the record does not suggest the operator acted with malice or intentional disregard for safety. However, the incident does highlight the importance of both following written procedures and not overly relying on protective equipment.

Under certain circumstances deviation from established written procedures may be warranted, albeit with supervisory concurrence. The RCA states: “the operations crew attempted unsuccessfully to synchronize to the grid four times without a questioning attitude and without consulting the Operations Superintendent and/or Station Manager.”⁵ According to DEF witness Simpson, the supervisor was present for some period of time during the troubleshooting process. However, witness Simpson could not confirm that the operator actually received supervisory approval to deviate from written procedures. Further, the RCA does not state that the operator received supervisory approval to disregard written procedures.

DEF witness Simpson testified that there was no approved written procedure in place for the procedure the operator was using to reset the synchronization, even though the operator had successfully utilized it at CR4 previously. DEF witness Simpson testified that the operator was properly trained and had the supporting materials necessary to correctly and safely operate the unit. However, according to the RCA, the supervisor had not received adequate on-the-job training prior to the incident.

Prior to the outage, the operator attempted to synchronize the CR4 unit to the grid three times in automatic mode over an approximate eight-second time period. For two of the three attempts, issues that may have been preventing automatic synchronization were identified, but the third attempt failed for an unknown reason. The RCA did not identify a root cause for the failed third attempt. DEF witness Simpson testified that proper procedure after a failed synchronization attempt is for operators to perform a walkdown for the purpose of discovering any issues, correcting the issues, and attempting synchronization again. According to the final version of the RCA, this walkdown process was performed for each of the three automatic synchronization attempts. However, this statement is contradicted in a draft version of the RCA that states: “The operators did not complete a thorough walkdown after each trip, therefore each time they attempted to sync there was another item holding them out.”⁶ DEF witness Simpson did not provide any explanation as to the discrepancy between the statement present in the draft RCA and the final RCA. The brief eight-second timeframe in which the automatic synchronization attempts occurred, and this contradictory statement, lead us to question whether a thorough walkdown occurred after each synchronization attempt. Since the CR4 outage event, the startup procedures have been revised to include guidance to contact either the Operations Superintendent or Plant Manager in the case of multiple failed automatic synchronization attempts.

As with all replacement power cases, our decision in this case is highly fact-specific. We find that the record is clear that if the operator had followed written procedures for either

⁴ Exhibit 8, Page 7.

⁵ Exhibit 8, Page 4.

⁶ TR 408; Exhibits 8, 64.

automatic or manual synchronization, the outage would not have occurred and the failed relay would have gone undetected until DEF performed an inspection. We also find that if the relay had not failed, then the operator's disregard of written procedures and use of an unapproved procedure would not have resulted in an outage. The record does not satisfactorily establish that either a thorough walkdown occurred after each synchronization attempt or that the operator received supervisory approval to deviate from the written procedure. Failure to follow approved written procedures for automatic or manual synchronization, coupled with the fact that although a supervisor was on site he was not consulted by the operator prior to using an unapproved procedure, is very troubling and does not constitute acceptable operational practices. However, we recognize that the operator, highly trained and with many years of experience, was relying on a procedure he had used successfully before. We also recognize that there was no device attached to the Beckwith Manual Sync Check Relay that would indicate the relay had failed since the last time the operator had used his unapproved procedure.

In sum, failure of the plant operator to follow written procedures, without supervisory approval, directly led to the outage at Crystal River Unit 4. However, the operator's reliance on an unapproved procedure that had been successful at CR4 in the past, coupled with repeated testing establishing the reliability of the relay, are mitigating factors that must also be taken into account. As such, we find that replacement power costs shall be shared equally by retail ratepayers and DEF. Therefore, DEF shall bear \$7.2 million of the \$14.4 million total replacement costs and credit its customers \$7.2 million associated with retail replacement power costs for the Crystal River Unit No. 4 outage through its 2021 Final True-Up filing.

Based on the foregoing, it is

ORDERED by the Florida Public Service Commission that the replacement power costs for the Crystal River Unit No. 4 outage shall be credited to Duke Energy Florida, LLC's retail ratepayers in the amount of \$7.2 million through its 2021 Final True-Up filing. It is further

ORDERED that the fuel and purchased power cost recovery clause docket is an on-going proceeding and shall remain open.

By ORDER of the Florida Public Service Commission this 21st day of December, 2021.



ADAM J. TEITZMAN
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Copies furnished: A copy of this document is provided to the parties of record at the time of issuance and, if applicable, interested persons.

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NOTICE OF FURTHER PROCEEDINGS OR JUDICIAL REVIEW

The Florida Public Service Commission is required by Section 120.569(1), Florida Statutes, to notify parties of any administrative hearing or judicial review of Commission orders that is available under Sections 120.57 or 120.68, Florida Statutes, as well as the procedures and time limits that apply. This notice should not be construed to mean all requests for an administrative hearing or judicial review will be granted or result in the relief sought.

Any party adversely affected by the Commission's final action in this matter may request: 1) reconsideration of the decision by filing a motion for reconsideration with the Office of Commission Clerk, 2540 Shumard Oak Boulevard, Tallahassee, Florida 32399-0850, within fifteen (15) days of the issuance of this order in the form prescribed by Rule 25-22.060, Florida Administrative Code; or 2) judicial review by the Florida Supreme Court in the case of an electric, gas or telephone utility or the First District Court of Appeal in the case of a water and/or wastewater utility by filing a notice of appeal with the Office of Commission Clerk, and filing a copy of the notice of appeal and the filing fee with the appropriate court. This filing must be completed within thirty (30) days after the issuance of this order, pursuant to Rule 9.110, Florida Rules of Appellate Procedure. The notice of appeal must be in the form specified in Rule 9.900(a), Florida Rules of Appellate Procedure.