State of Florida

Public Service Commission

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TALLAHASSEE, FLORIDA 32399-0850

-M-E-M-O-R-A-N-D-U-M-

DATE: December 4, 2014

TO: Office of Commission Clerk (Stauffer)

FROM: Division of Engineering (Matthews, Vickery)
Division of Accounting and Finance (Polk, Fletcher)
Division of Economics (Higgins)
Office of the General Counsel (Young)

RE: Docket No. 140113-EI – Petition for approval to construct an independent spent fuel storage installation and an accounting order to defer amortization pending recovery from the Department of Energy, by Duke Energy Florida, Inc.

AGENDA: 12/18/14 – Regular Agenda – Proposed Agency Action – Interested Persons May Participate

COMMISSIONERS ASSIGNED: All Commissioners

PREHEARING OFFICER: Brisé

CRITICAL DATES: None

SPECIAL INSTRUCTIONS: None

Case Background

In February 2013, Duke Energy Florida, Inc. (DEF or Company) made the decision to retire its Crystal River Unit 3 (CR3) nuclear-fueled generator. On November 12, 2013, Order No. PSC-13-0598-FOF-EI was issued in Docket No. 130208-EI, approving the Revised and Restated Stipulation and Settlement Agreement (RRSSA or 2013 Settlement Agreement) concerning the recovery of certain costs related to CR3. In the RRSSA, the signatories agreed that, effective the earlier of the first billing cycle for January 2017 or the expiration of the Levy Nuclear Project cost recovery charge, DEF was authorized to begin recovery of the final amount of the CR3 Regulatory Asset. The recovery amount is calculated based on two components: the

projected amount for dry cask storage (DCS) facility costs; and the CR3 Regulatory Asset as defined in paragraph 5b of the RRSSA.

At paragraph 5(e)(1) of the RRSSA, DEF is authorized to petition the Commission "for approval of the reasonable and prudent projected DCS facility capital costs."[1] After a final decision is made by the Commission, DEF is entitled to add the DCS facility costs to the CR3 Regulatory Asset for recovery purposes. Then, once the DCS facility capital costs become final, DEF is authorized a one-time "true-up" in order to make any necessary adjustments to the amount being recovered to account for differences in the projected costs and the final costs.

In nuclear decommissioning cost studies performed prior to the 2013 decision to retire CR3, the assumption was made that an independent spent fuel storage installation (ISFSI) – another term for dry cask storage – would have been constructed before 2036 (the originally planned CR3 decommissioning date), because the continued operation of the unit would have produced more spent fuel than could be contained in the existing spent fuel pool. For this reason, the cost of ISFSI construction was not included in those previous cost studies. However, since the unit has been retired, spent fuel is no longer being generated. This development created a situation in which DEF had certain options available to it for long-term storage of the spent fuel.

Another situation impacting DEF's handling of and accounting for the spent fuel storage issue is DEF's litigation against the U.S. Department of Energy (DOE). DEF contends that, due to the federal government's partial breach of its contractual obligation to pick up the spent fuel from DEF and store it in a federal repository, most of the costs for construction of the ISFSI are potentially recoverable from the DOE. DEF intends to use any judgment amounts received from the DOE to reduce the ISFSI portion of the CR3 Regulatory Asset.

DEF filed its petition in this docket on May 27, 2014. Along with the petition, the direct testimonies of two DEF witnesses were filed. Marcia J. Olivier provided testimony regarding the accounting order DEF is requesting to defer the amortization expense until after the litigation against the DOE is concluded. Michael R. Delowery's testimony includes a discussion and analysis of the cost-effectiveness of the various options for storing spent nuclear fuel until it is picked up by the DOE. In addition, DEF provided responses to three staff data requests in this matter.

This recommendation addresses DEF's petition for approval to construct an ISFSI and an accounting order to defer amortization of the costs pending recovery from the DOE. The Commission has jurisdiction over these matters pursuant to Sections 366.04(1), 366.05, and 366.06, Florida Statutes (F.S.).

[1] See Order No. PSC-13-0598-FOF-EI, issued November 12, 2013, in Docket No. 130208-EI, In re: Petition for limited proceeding to approve revised and restated stipulation and settlement agreement by Duke Energy Florida, Inc. d/b/a Duke Energy.

Discussion of Issues

Issue 1: Should Duke Energy Florida Inc.'s request for approval to construct an Independent Spent Fuel Storage Installation be approved?

Recommendation: Yes. DEF has demonstrated that the Independent Spent Fuel Storage Installation (ISFSI) is the most efficient and most cost-effective means to provide temporary storage capability of spent nuclear fuel, and staff recommends that DEF's request be approved. (Matthews)

Staff Analysis: In its petition in this docket, DEF requested Commission approval of its decision to construct an ISFSI for the storage of spent nuclear fuel at its Crystal River Unit 3 location. The ISFSI was originally designed to support the extended operating period of CR3, but the early retirement of the unit changed the timing and scope of the project. With spent nuclear fuel no longer being generated, only the storage of existing spent fuel is required.

Dry cask storage (DCS) is a term which refers to a method of storing spent nuclear fuel for long periods of time in order to allow the radioactivity of the material to decay naturally. The spent nuclear fuel is placed in containers approved for disposal by the U.S. Nuclear Regulatory Commission (NRC). The containers, also called dry shielded canisters, are then placed into horizontal storage modules for long-term storage. Staff notes that this type of configuration is not considered permanent storage. Each license for long-term storage issued by the NRC must have a specified term that cannot exceed 40 years; however, the license can be renewed for a period not to exceed an additional 40 years.[2] DEF's internal evaluation determined that, in the most likely scenario, the DOE will begin removing the spent nuclear fuel from the CR3 site in 2032, and the removal is estimated to be completed by the end of 2036.[3]

The ISFSI is needed until the federal government fulfills its contractual obligation to pick up the spent nuclear fuel from the CR3 site and transport it to a federal repository. The initial litigation against the DOE resulted in a favorable outcome for DEF with a judgment of over $21 million being awarded, and to which the DOE did not file an appeal. For this reason, DEF expects to be awarded additional judgments in the future.

Because no construction costs for a storage facility were included in any previous CR3 decommissioning studies, DEF evaluated three options for long-term storage of the spent nuclear fuel. One option available is to leave the spent fuel in its current location, which is the existing spent fuel pool (wet storage). A second option is to construct an ISFSI. A third option is to relocate the spent fuel by transporting it to another site or facility for long-term storage.

As explained by DEF witness Delowery in his prefiled testimony, DEF performed studies to analyze each of these three options. After the initial study was completed, DEF determined that moving the spent fuel to another location for storage was the least cost-effective option. The costs for offsite storage would include not only many of the same costs as for onsite dry storage, but also other costs including transportation, higher operations and maintenance (O&M) and

[2] See Responses to Staff's First Data Request, No. 9.
[3] See Exhibit MRD-1, p. 12 of 51, Section 4.4 (1).

security expenses, and environmental planning costs. In addition, DEF's analysis determined that there is a "high potential for intervenors and media concerns associated with spent fuel shipping."[4] Therefore, the offsite storage option was eliminated from further consideration.

The remaining two onsite storage options were then studied in more depth by DEF to determine which is the most cost-effective solution. The detailed economic evaluations for both of these alternatives were included as an attachment to the prefiled testimony of witness Delowery.

The onsite wet storage option entails leaving the fuel in the existing spent fuel pool currently located at the CR3 site with alternate cooling systems installed in order to reduce the O&M expenses associated with relying on existing plant systems. The onsite dry storage option analyzed was a modification to the original design for the ISFSI. Because no more spent fuel is being generated, the concrete pad size was reduced to accommodate a smaller number of canisters than the original design required. Both of these options meet the project requirements; accordingly, DEF made its selection based solely on the outcome of the cost-effectiveness analysis.

Both the onsite wet and dry storage options have advantages and disadvantages. The wet storage option allows for greater flexibility in the event of changing requirements including future implementation of dry storage or removal to another offsite location. Also, this option requires lower upfront costs because fewer immediate modifications are required, and no alterations to NRC licensing are required. However, storing the spent fuel in the existing spent fuel pool requires the maintenance of an active cooling system and the consolidation of the pool and its supporting equipment into a "nuclear island" concept. These factors necessitate higher long-term O&M costs (approximately $20 million per year higher than dry storage) for maintenance of cooling equipment, plus higher security costs.

In the case of dry storage, an ISFSI is a passive system which requires little interaction other than security activities. The ISFSI concept is the spent fuel storage configuration most commonly utilized at other decommissioned nuclear plants, and it will leave the smallest area to be maintained if the fuel remains at the CR3 site longer than anticipated. On the other hand, the upfront costs to construct the facility and procure the canisters are substantial. Also, contingency plans are required to maintain the ability to unload canisters and/or repackage the fuel for transport. It is for this reason that DEF plans to maintain the spent fuel pool in a recoverable condition, the cost of which was included in the analysis of the dry storage option.

DEF's analyses show that the onsite dry storage option is the most cost-effective solution. However, these costs are estimated based on the date selected for DOE pick-up of the spent nuclear fuel. In order to account for uncertainties in O&M costs, DEF evaluated sensitivities using three different dates on which the removal of spent nuclear fuel by DOE is expected to be completed. Because DOE currently has no plan for removing or storing spent nuclear fuel, it will be several years before for any removal activity can begin.

[4] See Exhibit MRD-1, p. 16 of 51, at "Option 3."