Consideration of New Information Regarding the Impacts of the Continued Storage of Spent Fuel for the South Texas Project Electric Generating Station Units 3 and 4 Combined License Application

Issue

In February 2011, the U.S. Nuclear Regulatory Commission (NRC or Commission) published NUREG-1937, "*Environmental Impact Statement for Combined Licenses (COLs) for South Texas Project Electric Generating Station Units 3 and 4: Final Report*." In September 2014, the NRC published a revised rule at Title 10 of the *Code of Federal Regulations* (CFR), Section 51.23 and the associated NUREG-2157, "*Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel*." In accordance with the revised rule, the impacts in NUREG-2157 are deemed incorporated into an environmental impact statement (EIS) for a COL application. This evaluation considers whether this new information is significant enough to warrant the publication of a supplement to the final EIS (FEIS).

Background

In the South Texas Project Electric Generating Station Units 3 and 4 (STP 3 and 4) FEIS, NUREG-1937, Section 6.1.6, "Radiological Wastes (for the fuel cycle)," the staff stated, in pertinent part:

> Further, in the Commission's Waste Confidence Decision and Rule (10 CFR 51.23(a)) (75 FR 81032), the Commission has made the generic determination that "if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 60 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor in a combination of storage in its spent fuel storage basin and at either onsite or offsite independent spent fuel storage installations. Further, the Commission believes there is reasonable assurance that sufficient mined geologic repository capacity will be available to dispose of the commercial high-level radioactive waste and spent fuel generated in any reactor when necessary." In addition, 10 CFR 51.23(b) applies the generic determination in Section 51.23(a) to provide that "no discussion of any environmental impact of spent fuel storage in reactor facility storage pools or independent spent fuel storage installations (ISFSI) for the period following the term of the . . . reactor combined license or amendment . . . is required in any . . . environmental impact statement . . . prepared in connection with . . . the issuance or amendment of a combined license for a nuclear power reactors under parts 52 or 54 of this chapter."

This portion of the FEIS was based on the version of 10 CFR 51.23 that was published in 2010. That rule was remanded by the court in *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012). On September 19, 2014, the Commission issued a revised rule at 10 CFR 51.23 and associated NUREG-2157. The revised rule adopts the generic impact determinations made in NUREG-2157 and codifies the NRC's generic determinations regarding the environmental impacts of continued storage of spent nuclear fuel beyond a reactor's operating license (i.e., those impacts that could occur as a result of the storage of spent nuclear fuel at at-reactor or away-from-reactor sites after a reactor's licensed life for operation and until a permanent repository becomes available).

In CLI-14-08, the Commission held that the revised 10 CFR 51.23 and associated NUREG-2157 cure the deficiencies identified by the court in *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012)

and stated that the rule satisfies the NRC's National Environmental Policy Act (NEPA) obligations with respect to continued storage for actions such as the STP 3 and 4 COL application. As directed by 10 CFR 51.23(b), the impacts assessed in NUREG-2157 are deemed incorporated into an EIS for a COL application.

Because the impacts assessed in NUREG-2157 are deemed incorporated into a COL EIS, the Commission must account for these environmental impacts before finalizing its licensing decision in the STP 3 and 4 proceeding. Taken together, NUREG-2157, the STP 3 and 4 FEIS, and other applicable environmental reviews, provide the NRC a complete environmental analysis of the impacts associated with spent fuel storage prior to disposal in a geologic repository.

To account for the results of the revised 10 CFR 51.23 and NUREG-2157, the staff must determine whether the revised rule at 10 CFR 51.23 and the associated NUREG-2157 present new and significant information such that a supplement to the STP 3 and 4 FEIS is required.

Requirements for Supplementing an Environmental Impact Statement

As required by 10 CFR 51.92(a), the staff will prepare a supplement to the FEIS for STP 3 and 4 if the proposed action (issuance of the COL) has not been taken and:

(1) There are substantial changes in the proposed action that are relevant to environmental concerns; or

(2) There are new and significant circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

The applicant for the STP 3 and 4 COL has not proposed any substantial changes to the proposed action that are relevant to environmental concerns. Therefore, 10 CFR 51.92(a)(1) does not require a supplement in this case.

Because the Commission has issued a revised rule and associated NUREG-2157, which are deemed incorporated into an EIS for a COL, the staff must determine whether the revised rule, 10 CFR 51.23, and NUREG-2157, present new and significant information such that a supplement to the FEIS for STP 3 and 4 is required under 10 CFR 51.92(a)(2). To merit a supplement, information must be both new and significant and it must bear on the proposed action or its impacts. The Commission has stated that for new information to be sufficiently significant to warrant preparation of a supplemental EIS, it must present "a seriously different picture of the environmental impact of the proposed project from what was previously envisioned."[1]

In determining whether new information meets this "seriously different picture" standard, the staff looks to, among other things: previous Commission decisions on claimed new and significant information; previous environmental analyses done for the proposed action at issue;

[1] *Union Electric Co*. (Callaway Plant, Unit 2), CLI-11-5, 74 NRC 141, 167-68 (2011); *Southern Nuclear Operating Co*. (Vogtle Electric Generating Plant, Units 3 and 4), CLI-12-11, 75 NRC 523, 533 n.53 (2012); *Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), CLI-99-22, 50 NRC 3, 14 (1999) (*citing Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 373 (1989); *Sierra Club v. Froehlke*, 816 F.2d 205, 210 (5th Cir. 1987)).

and the court decision in *Marsh.*[2] In other proceedings, the Commission has explained that if it found any new information that presents a significant new environmental impact that should be addressed in site-specific environmental analyses, the Commission would supplement or otherwise incorporate the information into the environmental analyses as warranted (See CLI-12-15). In doing so, the Commission will have provided access to the relevant information and the agency decision makers will have considered that information before a final decision on the matter is reached.[3]

Evaluation of Whether Revised 10 CFR 51.23 and NUREG-2157 Are New and Significant Information

Overview of 10 CFR 51.23 and NUREG-2157

Under 10 CFR 51.23, the impact determinations in NUREG-2157 regarding continued storage are deemed incorporated into the NRC's EISs for reactor licenses. The information in NUREG-2157 is the result of the staff's consideration of the particular deficiencies in the vacated Waste Confidence decision and rule. This consideration involved developing NUREG-2157 to address the issues raised by the court and support the revised rule, which was issued in draft form in September 2013. The staff's consideration of these issues was aided considerably by the public's extensive participation in the process, including comments received during scoping, on the draft NUREG-2157 and revised rule, and participation in nationwide public meetings, among other things. The information in NUREG-2157 was developed using an open and public process over the course of several years and the findings in NUREG-2157 are codified by rule at 10 CFR 51.23.

The staff's evaluation of the potential environmental impacts of continued storage of spent fuel presented in NUREG-2157 identifies an impact level, or a range of impacts, for each resource area for a range of site conditions and timeframes. The timeframes analyzed in NUREG-2157 include the short-term timeframe (60 years beyond the licensed life of a reactor), the long-term timeframe (an additional 100 years after the short-term timeframe), and an indefinite timeframe (see Section 1.8.2).

The analysis in NUREG-2157 concludes that the potential impacts of spent fuel storage at the reactor site in both a spent fuel pool and in an at-reactor independent spent fuel storage installation (ISFSI) would be SMALL during the short-term timeframe (see Section 4.20). However, for the longer timeframes for at-reactor storage, and for all timeframes for away-from-reactor storage, NUREG-2157 has determined a range of potential impacts in some resource areas (see Sections 4.20 and 5.20). NUREG-2157 also presents an assessment of cumulative impacts for continued storage, with ranges of potential impacts for most resource areas (see Section 6.5). These ranges reflect uncertainties that are inherent in analyzing environmental impacts to some resource areas over long timeframes. Those uncertainties exist, however, regardless of whether the impacts are analyzed generically or site-specifically.

Appendix B, NUREG-2157 provides an assessment of the technical feasibility of a deep geologic repository and continued safe storage of spent fuel. That assessment concluded that a deep geologic repository is technically feasible and that a reasonable timeframe for its

[2] *Marsh* provides that Agency decisions regarding the need to supplement an EIS based on new and significant information are subject to the "rule of reason."
[3] *Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), CLI-99-22, 50 NRC 3, 14 (1999).

development is approximately 25 to 35 years. The assessment in NUREG-2157 noted that the Department of Energy's goal is to have sited, constructed and commenced operations of a repository by the year 2048. In addition, the staff concluded that disposal of spent fuel in a repository would most likely occur in the short-term timeframe (see Section 1.2). If the current proposed action is approved and no renewals are granted in the future, the short-term timeframe will end 60 years after the end of the license period, or approximately 100 years after the plant begins operating. The licensed period plus the short-term timeframe is more than twice as long as the time estimated to develop a deep geologic repository.

Although the impact determinations in NUREG-2157 have been codified and are deemed incorporated into an EIS for a COL, as the Commission recently noted in CLI-14-08, "the results of the continued storage proceeding must be accounted for before finalizing individual licensing decisions." Therefore, the analysis below examines whether incorporating the impacts in NUREG-2157 paints a seriously different picture of the environmental impacts than those analyzed in the STP 3 and 4 FEIS. The STP 3 and 4 FEIS indicated that the impacts of storage of spent fuel after licensed life would be small, and the overall conclusion for all of Section 6.1.6, Radiological Wastes, was SMALL.

At-Reactor Storage

NUREG-2157 concluded that the potential impacts of at-reactor storage during the short-term timeframe (the first 60 years after the end of licensed life for operations of the reactor) would be SMALL (see Section 4.20). Further, NUREG-2157 states that disposal of the spent fuel by the end of the short-term timeframe is the most likely outcome (see Section 1.2). Thus, the potential impacts of at-reactor continued storage during the short-term timeframe are consistent with the evaluation in the STP 3 and 4 FEIS.

However, NUREG-2157 also evaluated the potential impacts of continued storage if the fuel is not disposed of by the end of the short-term timeframe. Of the environmental resource areas examined for at-reactor storage, all impact determinations for the long-term and indefinite timeframes were SMALL with the exception of historic and cultural resources (in the long-term and indefinite timeframes) and nonradioactive waste (in the indefinite timeframe).

NUREG-2157 determined that the impacts to historic and cultural resources from at-reactor storage during the long-term timeframe (the 100-year period after the short-term timeframe) and the indefinite timeframe (the period after the long-term timeframe) are dependent on factors that are unpredictable this far in advance and therefore concluded those impacts would be SMALL to LARGE (see Section 4.12). Among other things, as discussed in NUREG-2157, the NRC cannot determine at this time what resources may be present or discovered at a continued storage site a century or more in the future and whether those resources will be historically or culturally significant to future generations. Additionally, impacts greater than SMALL could occur if the activities to replace an ISFSI and the dry transfer system adversely affect cultural or historic resources and the effects cannot be mitigated. As discussed in NUREG-2157, given the minimal size of the facilities for continued storage of spent fuel, and the large land areas at nuclear power plant sites, licensees should be able to locate these facilities away from historic and cultural resources. Potential adverse effects on historic properties or impacts on historic and cultural resources could also be minimized through development of agreements, license conditions, and implementation of the licensee's historic and cultural resource management plans and procedures to protect known historic and cultural resources and address inadvertent discoveries during construction and replacement of these facilities. However, it may not be possible to avoid or mitigate adverse effects on historic properties under the National Historic

Preservation Act (NHPA) or impacts on historic and cultural resources under NEPA and, therefore, NUREG-2157 concluded that impacts would be SMALL to LARGE (see Section 4.12.2).

NUREG-2157 also concluded that the impacts of nonradioactive waste in the indefinite timeframe could be SMALL to MODERATE, with the higher impacts potentially occurring if the waste from repeated replacement of the ISFSI and dry transfer system exceeds local landfill capacity (see Section 4.15). Although the NRC has been able to eliminate the possibility that nonradioactive waste disposal would be destabilizing (or LARGE), the range reflects uncertainty regarding whether the volume of nonradioactive waste from continued storage would contribute to noticeable waste management impacts over the indefinite timeframe against the overall local volume of nonradioactive waste. Current or future waste minimization methods or technological advancements may be used to reduce the impacts of disposal of this waste.

As previously discussed, the staff found in NUREG-2157 that disposal of the spent fuel is most likely to occur by the end of the short-term timeframe. Therefore, disposal during the long-term timeframe is less likely, and the scenario depicted in the indefinite timeframe—continuing to store spent nuclear fuel indefinitely—is highly unlikely. As a result, the most likely impacts of the continued storage of spent fuel are those considered in the short-term timeframe. In the unlikely event that fuel remains on site into the long-term and indefinite timeframes, the ranges in NUREG-2157 reflect factors that lead to uncertainties regarding the potential impacts over these very long periods of time. Taking into account the impacts that the NRC can predict with certainty, which are SMALL; the uncertainty reflected by the ranges in the long-term and indefinite timeframes; and the relative likelihood of the timeframes, the staff finds that the impact determinations for at-reactor storage from NUREG-2157 do not present a seriously different picture of the environmental impacts compared to the staff's analysis in Section 6.1.6 of the STP 3 and 4 FEIS, Radiological Wastes, regarding the impacts from radiological wastes from the fuel cycle (which includes the impacts associated with spent fuel storage).

Away-From-Reactor Storage

NUREG-2157 concluded that a range of potential impacts could occur for some resource areas if the spent fuel from multiple reactors is shipped to a large (roughly 40,000 Metric Ton Uranium) away-from-reactor ISFSI (see Section 5.20). The ranges for resources such as air quality, terrestrial resources and aesthetics are driven by the uncertainty regarding the location of such a facility and the local resources that would be affected. For example, regarding terrestrial resource impacts, NUREG-2157 provided information that indicates that the impacts would likely be SMALL. However, it also stated that "it is possible that the construction of the project could have some noticeable, but not destabilizing, impacts on terrestrial resources, depending on what resources are affected." Therefore, in NUREG-2157, the staff concluded that the impacts to terrestrial resources would be SMALL to MODERATE (see Section 5.9.1) for the short-term timeframe based primarily on the potential impacts of construction activities. In addition, there are uncertainties associated with the longer timeframes that contribute to the ranges for historic and cultural resources and for nonradioactive waste, for the same reasons discussed for at-reactor storage.

An ISFSI of the size considered in NUREG-2157 could store the fuel from up to 25 reactors, which means the contribution of any individual reactor to the impacts of the ISFSI would be a fraction of the impacts of the facility as a whole. There is no such ISFSI currently in existence in the United States and there are no currently pending license applications for such a facility. The only such ISFSI to receive a license has not yet been built and its future remains uncertain.

Even if an application for such a facility were submitted in the future, it is uncertain whether it would be approved and uncertain whether it would be built. Such a facility would most likely receive spent fuel from older, permanently shutdown plants, rather than operating plants, and at any rate STP 3 and 4 would not have a need for such a facility for many years into the future. Considering all of this, it is unlikely that the spent fuel from STP 3 and 4 would be sent there. Therefore, at this time the staff concludes that it is unlikely that spent fuel from STP 3 and 4 would be moved to a large away-from-reactor ISFSI.

Based on the factors discussed above, there is uncertainty whether away-from-reactor storage would be constructed, uncertainty where it might be located, and uncertainty regarding the impacts in the short-term and the longer timeframes, leading to ranges of impacts. As a result, these impacts provide limited insights to the decision-maker in the overall picture of the environmental impacts from the proposed action and do not present a seriously different picture of the environmental impacts compared to the staff's analysis in Section 6.1.6 of the STP 3 and 4 FEIS, Radiological Wastes, regarding the impacts from radiological wastes from the fuel cycle (which includes the impacts associated with spent fuel storage).

Cumulative Impacts

NUREG-2157 examined the incremental impact of continued storage on each resource area analyzed in NUREG-2157 in combination with other past, present, and reasonably foreseeable future actions. NUREG-2157 indicates ranges of potential cumulative impacts for multiple resource areas (see Section 6.5). These ranges are primarily driven by impacts from activities other than the continued storage of spent fuel at the reactor site. The impacts from these other activities would occur regardless of whether spent fuel is stored during the continued storage period. In the short-term timeframe, which is the most likely timeframe for the disposal of the spent fuel, the potential impacts of continued storage for at-reactor storage are SMALL and would, therefore, not be a significant contributor to the cumulative impacts. Because the impacts during the short-term timeframe are SMALL, there would be no significant changes to the cumulative impacts discussion for STP 3 and 4 as currently written in Chapter 7 of the FEIS. In the longer timeframes for at-reactor storage, or in the less likely case of away-from-reactor storage, some of the impacts from the storage of spent fuel could be greater than SMALL. However, other Federal and non-Federal activities occurring during the longer timeframes, as noted in NUREG-2157, include uncertainties as well, contributing to the cumulative impacts. All of these uncertainties lead to the ranges in cumulative impacts as discussed throughout Chapter 6 of NUREG-2157. The overall cumulative impact conclusions would not be changed if the impacts of continued storage were removed. Taking into account the impacts that the NRC can predict with certainty, which are SMALL; the uncertainty reflected by the ranges in some impacts; and the relative likelihood of the timeframes, the staff finds that NUREG-2157 does not present a seriously different picture of the environmental impacts compared to the staff's analysis in the STP 3 and 4 FEIS regarding the cumulative impacts from radiological wastes from the fuel cycle (which includes the impacts associated with spent fuel storage).

Overall Conclusion

The conclusion in Section 6.1.6 of the STP 3 and 4 FEIS is that the impacts from radiological wastes from the fuel cycle of the proposed action – including those from continued storage – would be SMALL. To determine whether incorporating the impacts from NUREG-2157 requires a supplement to the FEIS, the staff analyzed the conclusions in NUREG-2157 to determine whether they present a seriously different picture of the environmental impacts that were discussed in the STP 3 and 4 FEIS.

Based on the information discussed above, the most likely impacts of continued storage are those discussed in NUREG-2157 for at-reactor storage. For continued at-reactor storage, impacts in the short-term timeframe would be SMALL. Over the longer timeframes, impacts to certain resource areas would be a range (for historic and cultural during both the long-term and indefinite timeframes the range is SMALL to LARGE and for nonradioactive waste during the indefinite timeframe the range is SMALL to MODERATE). NUREG-2157 states that disposal of the spent fuel before the end of the short-term timeframe is most likely. There are inherent uncertainties in determining impacts for the long-term and indefinite timeframes, and, with respect to some resource areas, those uncertainties could result in impacts that, although less likely, could be larger than those that are to be expected at most sites and have therefore been presented as ranges rather than as a single impact level. Those uncertainties exist, however, regardless of whether the impacts are analyzed generically or site-specifically. As a result, these impact ranges provide limited insights to the decision-maker in the overall picture of the environmental impacts from the proposed action. The staff concludes that these uncertainties, when weighed against the known impacts presented in the STP 3 and 4 FEIS; and the more-likely impacts of the short-term timeframe in NUREG-2157, which are SMALL, do not present a seriously different picture of the environmental impacts compared to the staff's analysis of the impacts from issuance of the STP 3 and 4 COL attributable to radiological wastes from the fuel cycle (which includes the impacts associated with spent fuel storage). Additionally, for the reasons discussed above, continued at-reactor storage is not expected to contribute noticeably to cumulative impacts.

Based on this analysis, the staff concludes that the information in NUREG-2157 does not present a seriously different picture of the environmental impacts of the proposed action when compared to the impacts that were described in the FEIS for STP 3 and 4. Therefore, this information does not warrant a supplement to the FEIS for STP 3 and 4. The revised rule and NUREG-2157 also do not alter the staff's recommendation that the COL should be issued.