NRR-PMDAPEm Resource

From: Klett, Audrey
Sent: Tuesday, March 07, 2017 4:56 PM
To: 'Mitch.Guth@fpl.com'
Cc: Czaya, Paul (Paul.Czaya@fpl.com); Mack, Jarrett; 'Hanek, Olga' (Olga.Hanek@fpl.com)
Subject: Request for Information re. Turkey Point 3 & 4 LAR 246 - CREVS TS (CACs MF8221 & MF8222)

Hi Mitch,

By application dated August 3, 2016, as supplemented by letters dated October 4, 2016, and January 27, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML16230A003, ML17032A345, and ML16291A495, respectively), Florida Power & Light Company (FPL, the licensee) proposed changes to the Turkey Point Nuclear Generating Unit Nos. 3 and 4 Technical Specifications (TSs). The licensee's proposed amendment would revise TS 3/4.7.5, "Control Room Emergency Ventilation System [CREVS]," to align more closely to NUREG-1431, Revision 4, "Standard Technical Specifications [STS] for Westinghouse Plants," Volumes 1 and 2 (ADAMS Accession Nos. ML12100A222 and ML12100A228), while reflecting the current plant design.

During its review, staff from the U.S. Nuclear Regulatory Commission's (NRC's) Office of Nuclear Reactor Regulation, Radiation Protection and Consequence Branch (ARCB) determined that additional information is required to complete its evaluation. The staff's request for additional information (RAI), which is numbered sequentially from the RAI dated December 5, 2016 (ADAMS Accession No. ML16340A037), is as follows. As discussed with Mr. Jarrett Mack and Ms. Olga Hanek of the licensee's staff on March 7, 2017, the NRC staff requests the licensee to respond to the RAI on or by March 31, 2017.

ARCB-RAI-5

The staff requests the licensee to either (1) provide a synopsis (in enough detail to allow the staff to perform a confirmation calculation) of a fuel handling accident (FHA) analysis that supports the proposed change, (2) revise the proposed changes to remove the extension of the use of mitigating actions to Modes 5, 6, and during movement of irradiated fuel assemblies, or (3) otherwise explain how the proposed changes regarding the extension of the use of mitigating actions to Modes 5, 6, and during movement of irradiated fuel assemblies meet Title 10 of the *Code of Federal Regulations* (10 CFR), Section 20.1701, 10 CFR 20.1702, and the regulatory guidance in STS 3.7.10 of NUREG-1431.

Basis for the Request

The proposed changes would revise TS 3/4.7.5 ACTION b to allow movement of irradiated fuel upon verification that mitigating actions ensure control room envelope (CRE) occupant radiological and chemical hazards will not exceed limits and CRE occupants are protected from smoke hazards with the CRE boundary inoperable in Modes 1 through 6 and during movement of irradiated fuel assemblies. Section 3.2 of the license amendment request (LAR) states:

> In the case of an inoperable CRE boundary, the current TS ACTION 3.7.5.b does not require placing the Control Room in the emergency recirculation mode nor does the CREVS provide for a redundant component or train which assures CREVS specified functionality given a single failure. However Westinghouse STS ACTION 3.7.10.B provides for a ninety-day AOT [allowed outage time] without the suspension of irradiated fuel movement after first verifying within 24 hours that mitigating actions ensure CRE occupant exposures to radiological and chemical hazards will not exceed allowable limits and CRE occupants are protected from smoke hazards. In contrast, TS ACTION 3.7.5.b requires the suspension of irradiated fuel movement for the

duration of the 90-day AOT even after first verifying within 24 hours that mitigating actions ensure CRE occupant exposures to radiological and chemical hazards will not exceed allowable limits and CRE occupants are protected from smoke hazards. FPL proposes for an inoperable CRE boundary for all plant MODES, the immediate suspension of fuel movement for the first 24 hours, during which mitigating actions would be verified to ensure CRE occupant exposures to radiological and chemical hazards will not exceed allowable limits and CRE occupants are protected from smoke hazards, and following which irradiated fuel movement may resume. Irradiated fuel movement would also be suspended if the 90-day AOT cannot be met. Though relaxing the requirement to suspend fuel movement for the duration of the 90-day AOT is less restrictive than the current Turkey Point TS, the proposed change maintains a commensurate level of safety when judged against the current regulatory standards established in the Westinghouse STS for an inoperable CRE boundary and is thereby reasonable.

Westinghouse STS 3.7.10, "Control Room Emergency Filtration System (CREFS)," provides a protected environment from which occupants can control the unit following an uncontrolled release of radioactivity, hazardous chemicals, or smoke. STS 3.7.10 Action B is entered when one or more CREFS trains are inoperable due to an inoperable CRE boundary *while in Modes 1, 2, 3, and 4*. Action B allows ninety days to restore the inoperable CRE boundary to operable status, if actions are immediately taken to implement mitigating actions and CRE occupant exposure to radiological, chemical and smoke hazards is verified within 24 hours to not exceed limits. *Action B is only entered in Modes 1 through 4*. *If the unit is in Modes 5, 6, or moving recently irradiated fuel assemblies* then Action E is applicable and must be entered. STS 3.7.10 Action E is entered when one or more CREFS trains are inoperable due to an inoperable CRE boundary *while in Modes 5 or 6 or during movement of recently irradiated fuel assemblies* and requires immediately suspending movement of recently irradiated fuel assemblies. Action E takes immediate action to suspend activities that could result in a release of radioactivity that might require isolation of the CRE.

In its letter dated June 18, 2009 (ADAMS Accession Number ML091690643), the Technical Specifications Task Force (TSTF) submitted Traveler TSTF-508, Revision 1, "Revise Control Room Habitability Actions to Address Lessons Learned from TSTF-448 Implementation," to the NRC for review and approval. TSTF-508 proposed the extension of the use of mitigating actions to Modes 5, 6, and during movement of recently irradiated fuel assemblies when one or more CREFS trains is inoperable due to an inoperable CRE boundary in Westinghouse STS 3.7.10, just as the licensee has requested in its LAR. During the review of TSTF-508, the staff requested additional information (ADAMS accession number ML110890817), in which the staff stated that the extension of the use of mitigating actions to Modes 5, 6, and during movement of recently irradiated fuel assemblies is not adequately justified and is not warranted for the following reasons:

- Subpart H of 10 CFR Part 20, "Standards for Protection against Radiation," provides the requirements for respiratory protections and controls to restrict internal exposure in restricted areas. Specifically, 10 CFR 20.1701 states that licenses shall use, to the extent practicable, process or engineering controls to control the concentration of radioactivity in the air. Use of other controls as described in 10 CFR 20.1702 is only allowed by regulation when it is not practicable to apply process or other engineering controls.

- NEI 99-03, Appendix F, "Compensatory Measures Allowable On An Interim Basis," Page F-1, states:

  > The use of SCBA [self-contained breathing apparatus] and KI [potassium iodide] has been determined to be acceptable for addressing control room envelope integrity in the interim situation until the licensee remediates the issue. However, use of SCBA or KI in the mitigation of situations where in-leakage does not meet design basis limits is not acceptable as a permanent solution. 10 CFR 20.1701 essentially says that engineering/process controls shall be used to the extent practical. If not practical, then 10 CFR 20.1702 methods should be used. Therefore, the use of SCBAs should be a last resort. [emphasis added]

- The use of KI and SCBA is not without risk. The allowance to use KI and SCBA was not previously extended to Modes 5 and 6 because another practical control (i.e., stopping fuel movement) existed. The staff does not believe that the proposed compensatory measures are appropriate given that the process control of stopping fuel movement is available.

The TSTF did not respond to the RAI; rather, it withdrew its request for NRC to approve TSTF-508. The licensee's application does not appear to address how the proposed changes (i.e., to allow movement of irradiated fuel upon verification that the mitigating actions ensure CRE occupant radiological and chemical hazards will not exceed limits and CRE occupants are protected from smoke hazards while in Modes 5, 6, and during movement of irradiated fuel assemblies) meet the regulations or the regulatory guidance below and as stated in the basis for the TSTF-508 RAI.

Subpart H of 10 CFR Part 20, "Standards for Protection against Radiation," provides the requirements for respiratory protections and controls to restrict internal exposure in restricted areas. Specifically, 10 CFR 20.1701 states that licenses shall use, to the extent practical, process or engineering controls to control the concentration of radioactivity in the air. Use of other controls as described in 10 CFR 20.1702 is only allowed by regulation when it is not practical to apply process or other engineering controls.

The FHA source term per Regulatory Guide (RG) 1.183 is based on maximum full power operation of the core with, as a minimum, current licensed values for fuel enrichment, fuel burnup, and an assumed core power equal to the current licensed rated thermal power times the emergency core cooling system evaluation uncertainty. Because the FHA does not involve the entire core, the fission product inventory of each of the damaged fuel rods is determined by dividing the total core inventory by the number of fuel rods in the core. To account for differences in power level across the core, radial peaking factors from the facility's core operating limits report or TSs is applied in determining the inventory of the damaged rods. Because FHA occurs while the facility is shutdown, radioactive decay from the time of shutdown may be modeled. The FHA for Turkey Point models the radioactive decay from the time of shutdown in development of the source term. This time is 72 hours and is reflected in Turkey Point TS 3/4.9.3, "Decay Time."

Many plants that have adopted an AST develop their FHA source term using this method, and their radioactive decay from the time of shutdown varies from 0 hours to approximately 120 hours. This time is an initial condition of the FHA analysis, and plants cannot move irradiated fuel prior to this time; otherwise, they are operating outside their licensing basis, which is not allowed. This time is not shown in the STS. The FHA onsite and offsite radiological doses are calculated, using the source term discussed above and assume reductions in the amount of radioactive material released by engineered safety feature (ESF) filter systems in accordance with RG 1.183. These systems vary depending on location of the release (e.g., inside containment or the spent fuel pool) and the systems available at each plant, but they usually take credit for a CREFS and a fuel building filtration system for spent fuel pool releases.

Turkey Point's approved FHA analysis is based on the failure of one fuel assembly and uses a radial peaking factor of 1.65 and a radioactive decay from the time of shutdown of 72 hours. The analysis does not credit ESF filtration for the containment or spent fuel pool release, but it does credit a reduction of the radioactive material released from filtration by the CREVS 30 seconds after the occurrence of an FHA for releases in containment and 30 minutes after the occurrence of an FHA for releases in the spent fuel pool.

Independent of the radioactive decay from the time of shutdown discussed above, some licensees have chosen to adopt an additional decay time. This decay time, $T_{nofilter}$, is also radioactive decay from the time of shutdown, with the difference being that the onsite and offsite radiological doses calculated for an FHA using this decay time usually do not consider reductions in the amount of radioactive material released by ESF filter systems. Specifically, the onsite radiological doses calculated for an FHA do not credit reduction from the CREFS. This decay time ($T_{nofilter}$) is associated with the term "recently irradiated fuel assemblies" described and used in the STS. Prior to expiration of this decay time ($T_{nofilter}$), the CREFS is needed to maintain onsite radiological doses below the 10 CFR 50.67 limits. The STS reflect this decay time ($T_{nofilter}$) by requiring the CREFS Limiting Conditions for Operation to be met during movement of recently irradiated fuel assemblies; thus, STS applicability is during movement of recently irradiated fuel assemblies.

Turkey Point's approved FHA analysis does not include an analysis that shows that the onsite and offsite radiological doses meet the limits stated in 10 CFR 50.67 using the additional decay time discussed in the previous paragraph ($T_{nofilter}$) to determine the FHA source term, and no credit for filtration by the CREVS or other ESF filter systems. Therefore, Turkey Point's proposed TS applicability of during movement of irradiated fuel assemblies is the equivalent of STS's during movement of recently irradiated fuel assemblies.

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