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FPL Energy.

Duane Arnold Energy Center

December 18, 2008

NG-08-0961
10 CFR 54.17
10 CFR 50.4

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

Duane Arnold Energy Center
Docket 50-331
License No. DPR-49

Response to Issues Raised in the Review Status of the License Renewal Application for the Duane Arnold Energy Center

References:
1. Letter, Richard L. Anderson (FPL Energy Duane Arnold) to Document Control Desk (USNRC), Duane Arnold Energy Center Application for Renewed Operating License TSCR-109, dated September 30, 2008 (ML082980623)
2. Letter, Brian Holian (USNRC) to Richard L. Anderson (FPL Energy Duane Arnold), Review Status of the License Renewal Application for the Duane Arnold Energy Center, dated December 11, 2008

By Reference 1, FPL Energy Duane Arnold, LLC (hereafter, FPL Energy Duane Arnold) provided the application for a renewed operating license for the Duane Arnold Energy Center (DAEC).

In Reference 2, the Staff identified a number of deficiencies in the application of Reference 1 and requested that these deficiencies be addressed. The staff also requested that a re-review of the application for similar deficiencies be performed. The enclosure to this letter provides FPL Energy Duane Arnold's plans for resolving these deficiencies and supplementing the license renewal application.

This letter contains the following commitment:

> FPL Energy Duane Arnold will supplement the DAEC license renewal application of Reference 1 to include the information and results of reviews provided in the enclosure to this letter by January 30, 2009.

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If there are any questions or additional information is needed, please contact Kenneth S. Putnam, License Renewal Project Manager, at (319) 851-7238.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 18, 2008.

Richard L. Anderson
Vice President, Duane Arnold Energy Center
FPL Energy Duane Arnold, LLC

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, DAEC, USNRC
Senior Resident Inspector, DAEC, USNRC
Project Manager, NRR - License Renewal
D. McGhee (State of Iowa)

Enclosure

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NRC Question #1:

Table 3.1.2-1 of the application contains information on the reactor vessel (RV) that is not consistent with the plant's current licensing basis documentation. General Electric Capsule Report No. GE-NE-B1100716, Revision 0, for Duane Arnold, which was submitted to the NRC in accordance with 10 CFR 50, Appendix H, identifies that the RV has four RV shells: an upper shell, an upper intermediate shell, a lower intermediate shell, and a lower shell. However, Table 3.1.2-1 of the application only lists three shells for the RV: an upper shell, an intermediate shell, and a lower shell. Furthermore, of these three shells, the application only identifies the RV intermediate shell as within the beltline of the RV. However, the Capsule Report identifies the RV lower intermediate shell and the RV lower shell as within the RV beltline region.

FPL Energy Duane Arnold Response:

Table 3.1.2-1 will be revised to separate the line item for "intermediate shell" into two line items: upper intermediate shell and lower intermediate shell. The material, environment and aging effects are equivalent for both the upper and lower intermediate shells except that the upper intermediate shell is not subjected to a loss of fracture toughness as it is located outside the beltline region.

The supporting fluence analysis for the License Renewal application currently reflects that portions of the lower shell are within the beltline region of the vessel. The aging effect of "loss of fracture toughness" was inadvertently omitted from the table for the lower shell and will be added.

Similar Items:

The "component types" will be reviewed against the supporting analysis and if warranted further components will be added. The tables in the application will be reviewed to confirm aging effects listed are consistent with the supporting analysis.

NRC Question #2:

The "condensation" service environment is not consistently characterized in the application. For example, for the compressed air system, Table 3.3-1 of the application indicates that condensation is "wet air/gas." Table 3.3.2-27 indicates that it is "air/gas." Table 3.0-1, under wet air/gas, indicates that condensation is considered "raw water." However, under raw water in Table 3.0-1, it does not discuss condensation.

FPL Energy Duane Arnold Response:

The DAEC Aging Management Review process typically evaluated the component aging based on the environment listed in the applicable NUREG 1801, Generic Aging Lessons Learned (GALL) Report, Vol. 2 line items listed in the 3.X.2 tables. When preparing the corresponding 3.X.2 tables in the LRA, the environments were grouped together, resulting in the consistency problem.

The environments listed in the application will be revised to better match the environments listed in NUREG-1801 Vol. 2, Rev. 1, Chapter IX.

Similar Items:

All environments listed in the application will be reviewed to ensure consistent terminology is used.

NRC Question #3:

Metal fatigue of non-Class 1 components is not addressed as time-limited aging analysis (TLAA) as indicated in the application. For example, Sections 3.3.2.2.1 and 3.3.3 indicate that metal fatigue of the auxiliary system is evaluated in Section 4.3 of the application. However, Section 4.3 only addresses metal fatigue of the reactor vessel, Class 1 piping, and core plate rim hold-down bolts.

FPL Energy Duane Arnold Response:

Class 2 and Class 3 piping at DAEC was typically designed and built to the standard of B31.1 or B31.7 depending on the system (see Updated Final Safety Analysis Report (UFSAR) Table 3.2). Under both of these versions of the code, metal fatigue of Class 2 and Class 3 piping is addressed in a similar manner. Evaluation of this for a 60 year life is addressed in Section 4.3.2 of the application. The discussion in the application will be expanded to specify its applicability to Class 2 and Class 3 piping.

Similar Items:

All TLAA discussions in the LRA will be reviewed to ensure they contain appropriate details related to component applicability.

NRC Question #4:

Information in Appendix C, "Responses to [Boiling Water Reactor Vessel and Internals Project] BWRVIP Application Action Items," is not consistent with that in the application. For example, Item 4 in Table C-4 states, "The DAEC [Standby Liquid Control] SBLC nozzle has been evaluated for fatigue and shown to be acceptable for

60 years. See Section 4 of this application." However, the staff could not find this information in Section 4 of the application. For another example, Item 4 in Table C-7 states, "...Of these, fatigue is a TLAA for the [Control Rod Drive] CRD stub tube and housing and was determined to be acceptable for 60 years. See Section 4 of this application." However, Table 4.3-2 of the application indicates that these components are exempted.

FPL Energy Duane Arnold Response:

The SBLC nozzle is evaluated under the DAEC design by a bounding analysis listed in Table 4.3-2 as "Miscellaneous Nozzles." Table 4.3-2 will be annotated to clarify which nozzles are included in the "Miscellaneous" category.

The current design basis exempts the CRD penetration housing and the CRD penetration stub tube from fatigue analysis per Paragraph N-415.1 of Section III of the ASME Code. New fatigue exemption analyses were performed using the projected number of cycles for 60 years. These analyses validated the fatigue exemption for 60 years of operation. Therefore, both the CRD penetration housing and the CRD penetration stub tube are acceptable from a fatigue standpoint for 60 years of plant operation.

Similar Items:

The TLAA summaries will be reviewed to determine where greater detail is needed to aid in the review. Those summaries lacking sufficient detail will be revised.

NRC Question #5:

Chapter 3 of the application contains inconsistent documentation of the potential degradation of heat transfer capability due to fouling for heat exchanger or air cooler surfaces that are exposed to raw water. Sometimes fouling is indicated as an applicable aging effect and sometimes it is not.

FPL Energy Duane Arnold Response:

Heat exchangers within the scope of 10 CFR 54.4(a)(1) or (a)(3) which are exposed to raw water and that perform a heat transfer intended function have a heat transfer degradation aging effect. If a heat exchanger is in-scope due to 10 CFR 54.4(a)(2) only, and heat transfer is not an intended function, then its intended function is Leakage Boundary (Spatial) and heat transfer degradation is not an aging effect requiring management.

Similar Items:

All heat exchanger entries in the tables for Chapter 3 will be reviewed to confirm this is applied consistently.

NRC Question #6:

Chapter 3 of the application identifies the plant water environment as either treated water or raw water. However, the specific water environment, such as reactor coolant, closed-cycle cooling, and borated water (for the standby liquid control system), and specific environmental details, such as water temperature and fluence level, affect the assessment of potential aging effects and aging management. The applicant's generalization of water environment causes technical information ambiguities in the application. For example, the application identifies cracking as a potential aging effect for some stainless steel components in treated water but not for others, creating inconsistencies with no explanation.

FPL Energy Duane Arnold Response:

Information on the environmental parameters is contained in the Aging Management Review reports on site. Details regarding temperature and neutron fluence will be extracted from these reports and added to the application.

The environments listed in the application will be revised to better match the environments listed in NUREG-1801 Vol. 2, Rev. 1, Chapter IX.

Similar Items:

All environments listed in the application will be reviewed to ensure consistent terminology is used.

NRC Question #7:

Section 2.0 of the application indicates that the plant's integrated plant assessment methodology follows the approach recommended in NEI 95-10. However, NEI 95-10, Section 3.3, "Documenting the Scoping Process," indicates that the applicant should identify systems, structures, and components' functions that meet the requirements of 10 CFR 54.4(b) and therefore are intended functions. The application does not contain this information for specific systems, structures, and components. It merely repeats the rule language in 10 CFR 54.4(a). The staff sampled sections of the FSAR and often could not determine why a system is or is not within the scope of license renewal based on the FSAR description.

FPL Energy Duane Arnold Response:

The system's intended functions are contained in the on-site scoping and screening documents for each system. This information will be extracted from the scoping and screening documents and included in Section 2 of the application. This will allow for an easier comparison to the UFSAR.

Similar Items:

The above response applies to all systems.

NRC Question #8:

Section 4.7, "Other Plant-Specific TLAAs," of the application contains mostly concluding statements of TLAA evaluations. For example, Section 4.7.4, "Evaluation of Thermal Fatigue Effects on Steam Lead and Inlet to RPV," states that the temperature cycles have been increased by 1.5 and backflow cycles have been added. It then states that the additional cycles during a 60 year life "can be tolerated." There is no justification for the assumptions, such as the factor 1.5 and the number of backflow cycles. It also does not discuss the current status, such as the number of cycles experienced, and the acceptance criteria for the TLAA evaluation. Furthermore, no reference for the TLAA is provided in the application.

FPL Energy Duane Arnold Response:

The discussion of this TLAA in the application will be expanded to include assumptions, acceptance criteria, and references.

Similar Items:

Other TLAAs will be reviewed to confirm they include an appropriate level of detail.

NRC Question #9:

The application does not identify any aging effects for rubber, elastomer, or thermoset polymer for system components.

FPL Energy Duane Arnold Response:

For DAEC mechanical systems, there are relatively few components within the scope of license renewal that are composed of rubber, elastomer, or thermoset polymer. A number of these components will be periodically replaced and therefore would not be subject to an aging management review. The remaining components are made of synthetic rubber such as neoprene and these have been evaluated for aging effects in accordance with the Electric Power Research Institute (EPRI) tools. No aging effects were identified.

Aging effects for these materials are also identified in electrical and civil/structural portions of the application and appropriate aging management is currently specified.

Similar Items:

FPL Energy Duane Arnold will consider the desirability of periodically replacing the remaining in-scope elastomers found in mechanical systems