



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 20, 2013

Mr. Adam C. Heflin
Senior Vice President
and Chief Nuclear Officer
Union Electric Company
P.O. Box 620
Fulton, MO 65251

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE
CALLAWAY PLANT, UNIT 1, LICENSE RENEWAL APPLICATION, SET 27
(TAC NO. ME7708)

Dear Mr. Heflin:

By letter dated December 15, 2011, Union Electric Company (Ameren Missouri) (the applicant) submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54 (10 CFR Part 54) for renewal of operating license no. NPF-30 for the Callaway Plant, Unit 1 (Callaway). The staff of the U.S. Nuclear Regulatory Commission (NRC or the staff) is reviewing this application in accordance with the guidance in NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants." During its review, the staff has identified areas where additional information is needed to complete the review. The staff's requests for additional information are included in the enclosure. Further requests for additional information may be issued in the future.

Items in the enclosure were discussed with Sarah G. Kovaleski, of your staff, and a mutually agreeable date for the response is within 60 days from the date of this letter for RAI B2.1.6 -46 and within 30 days from the date of this letter for RAI B2.1.6-4C. If you have any questions, please contact me by telephone at 301-415-2946 or by e-mail at Samuel.CuadradoDeJesus@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Samuel Cuadrado de Jesús".

Samuel Cuadrado de Jesús, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosure:
As stated

cc: Listserv

September 20, 2013

Mr. Adam C. Heflin
Senior Vice President
and Chief Nuclear Officer
Union Electric Company
P.O. Box 620 Fulton, MO 65251

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE
CALLAWAY PLANT, UNIT 1, LICENSE RENEWAL APPLICATION, SET 27
(TAC NO. ME7708)

Dear Mr. Heflin:

By letter dated December 15, 2011, Union Electric Company (Ameren Missouri) (the applicant) submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54 (10 CFR Part 54) for renewal of Operating License no. NPF-30 for the Callaway Plant, Unit 1 (Callaway). The staff of the U.S. Nuclear Regulatory Commission (NRC or the staff) is reviewing this application in accordance with the guidance in NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants." During its review, the staff has identified areas where additional information is needed to complete the review. The staff's requests for additional information are included in the enclosure. Further requests for additional information may be issued in the future.

Items in the enclosure were discussed with Sarah G. Kovaleski, of your staff, and a mutually agreeable date for the response is within 60 days from the date of this letter for RAI B2.1.6 -46 and within 30 days from the date of this letter for RAI B2.1.6-4C. If you have any questions, please contact me by telephone at 301-415-2946 or by e-mail at Samuel.CuadradoDeJesus@nrc.gov.

Sincerely,

/RA by Yoira Diaz-Sanabria for/
Samuel Cuadrado de Jesús, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosure:

As stated

cc: Listserv

DISTRIBUTION:

See next page

ADAMS Accession No.: ML13253A210

OFFICE	LA:DLR/RPB2	PM:DLR/RPB1	BC:DLR/RPB1	PM:DLR/RPB1
NAME	lKing	SCuadrado	YDiaz-Sanabria	SCuadrado
DATE	9/12/2013	9/20/2013	9/20/2013	9/20/2013

OFFICIAL RECORD COPY

Letter to A. Heflin from S. Cuadrado de Jesus dated September 20, 2013

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE
CALLAWAY PLANT, UNIT 1, LICENSE RENEWAL APPLICATION, SET 27
(TAC NO. ME7708)

DISTRIBUTION:

HARD COPY:

DLR R/F

E-MAIL:

PUBLIC

RidsNrrDlrResource

RidsNrrDraAfpb Resource

RidsNrrDraApla Resource

RidsNrrDeEmcb Resource

RidsNrrDeEeeb Resource

RidsNrrDssSrxb Resource

RidsNrrDssSbpb Resource

RidsNrrDssScvb Resource

RidsOgcMailCenter Resource

SCuadrado

FLyon

THartman

CFells

DMorey

BMizuno (OGC)

DCylkowski (OGC)

LSubin (OGC)

GPick (RIV)

CALLAWAY PLANT, UNIT 1

LICENSE RENEWAL APPLICATION

REQUEST FOR ADDITIONAL INFORMATION, SET 27

RAI B2.1.6-4b

Background:

By letter dated October 24, 2012 (Ameren Letter No. ULNRC-05920, as docketed in ADAMS ML12299A249), the applicant responded to RAI B2.1.6-4. In its response, the applicant stated that Applicant/License Action Item No. 7 (A/LAI No. 7) from Electric Power Research Institute (EPRI) Technical Report (TR) No. 1022863, "Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluation Guidelines (MRP-227-A)," is not applicable to the design of the Callaway Plant (Callaway) reactor vessel internal (RVI) components because the lower support column bodies at the facility were not fabricated from cast austenitic stainless steel (CASS) materials. The reference document for all applicable A/LAIs in the MRP-227-A report is given in the NRC's revised safety evaluation on the MRP-227-A report, dated December 16, 2011 (ADAMS ML11308A770).

Issue:

The staff agrees that A/LAI No. 7 of MRP-227-A report would not be applicable to the design of the lower core support column bodies if they are not made from CASS materials. However, the scope of A/LAI No. 7 also applies to any component made from a CASS, martensitic stainless steel, or precipitation hardened, martensitic stainless steel material that was not considered and evaluated in the development of the MRP-227-A report (i.e., not considered or evaluated in either MRP-227-A or the supporting MRP background documents). Updated Final Safety Analysis Report (UFSAR) Table 5.2-4 identifies that the Callaway RVI design includes RVI components made from SA-351 CF8 or CF8A CASS materials. To resolve the request in A/LAI No. 7, the staff needs clarification regarding RVI components in the plant design that were made from these types of CASS materials and whether the applicable CASS components were considered in the development and component category disposition bases in MRP-227-A.

Request:

Based on the design basis information in UFSAR Table 5.2-4, identify those RVI components that are specifically fabricated from CF8 or CF8A CASS materials. For those RVI components that are made from these materials, clarify whether the components were considered in the development of the MRP-227-A recommendations for management of thermal aging embrittlement and neutron irradiation embrittlement effects and dispositioned in accordance with applicable component category recommendations for the components in the MRP-227-A report. If it is determined that any RVI CASS component was not considered in the development of MRP-227-A and appropriately dispositioned in the report, clarify and justify how the pressurized-water reactor (PWR) Vessel Internals Program will be adjusted under A/LAI No. 2 to manage loss of fracture toughness in the components as a result of potential neutron irradiation embrittlement and thermal aging embrittlement mechanisms; consistent with the position in A/LAI No. 7, if the basis for aging management (as applicable) will be by implementation of a

component-specific evaluation, submit the evaluation for NRC review and approval as an enclosure to your RAI response.

RAI B2.1.6-4c

Background:

By letter dated January 24, 2013 (Ameren Letter No. ULNRC-05950, dated January 24, 2013, as docketed in ADAMS ML13029A243 and ML13029A244), the applicant responded to RAI B2.1.6-4a. In that letter and response, the applicant used an LRA commitment (as given in Commitment No. 20 in license renewal application (LRA) UFSAR Supplement Table A4-1) as the basis for resolving the request in A/LAI No. 8, Subitem 5 on the MRP-227-A report methodology.

LRA Table 4.3-5 provides those RVI components in the plant design that were analyzed in accordance with an applicable design basis fatigue analysis (i.e., cumulative usage factor [CUF] analysis). In LRA Section 4.3.3 of the LRA, the applicant states that the CUF values for these RVI components are time-limited aging analysis (TLAAs) and that these TLAAs are acceptable in accordance with the criterion in 10 CFR 54.21(c)(1)(iii). The applicant currently credits its Fatigue Monitoring Program as the basis for managing fatigue induced cracking in the components during the period of extended operation.

Issue:

In the Ameren letter of April 26, 2013 (Ameren Letter No. ULNRC-05979 as docketed in ADAMS ML13119A133, ML13119A136, and ML13119A137), the applicant amended the LRA to resolve the request in A/LAI No. 8, Subitem 5 by superseding the existing Commitment No. 4 with the following amended commitment basis:

Applicant/Licensee Action Item (A/LAI) #8 Item #5
(in part - reactor coolant system water environment portion)

Enhance the Fatigue Monitoring program to evaluate the effects of the reactor coolant system water environment on the reactor vessel internal components with existing fatigue CUF analyses to satisfy the evaluation requirements of ASME Code, Section III, Subsection NG-2160 and NG-3121,

Upon further review, the staff has determined that the neither UFSAR Supplement for the Fatigue Monitoring Program, as given in LRA UFSAR Supplement Section A2.1, "Fatigue Monitoring," nor Commitment No. 31 on the Fatigue Monitoring Program in UFSAR Table A4-1 have been amended to include the stated enhancement. Therefore, the staff seeks additional justifications on why UFSAR Supplement A2.1 and Commitment 31 in UFSAR Supplement Table A4-1 have not been enhanced consistent with the commitment change in UFSAR Supplement Table A4-1, Commitment No. 4. The staff also needs clarification on how the program elements of the Fatigue Monitoring Program will be adjusted to evaluate (account for) the effects of the reactor coolant environment on the acceptability of the CUF analyses for the applicable RVI components.

Request:

Provide your basis why Commitment No. 31 in UFSAR Table A4-1 and UFSAR Section A2.1, "Fatigue Monitoring," has also not been amended to include this enhancement. Clarify and justify how the program elements of the Fatigue Monitoring Program will be adjusted to evaluate the effects of the reactor environment on the CUF analyses for the applicable RVI components.