



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

November 21, 2012

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 17,
(TAC NO. ME7708)

Dear Mr. Heflin:

By letter dated December 15, 2011, Union Electric Company d/b/a 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. 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 30 days from the date of this letter. 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 "S. Cuadrado de Jesús", written over the typed name.

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

Docket No. 50-483

Enclosure:
Requests for additional information

cc w/encl: Listserv

CALLAWAY PLANT, UNIT 1
LICENSE RENEWAL APPLICATION
REQUEST FOR ADDITIONAL INFORMATION, SET 17

RAI 4.3-2a

Background:

In response to Part (a) to request for additional information (RAI) 4.3-2 dated October 11, 2012, Union Electric Company d/b/a Ameren Missouri (the applicant) provided the short-term and long-term weighting factors. However, the applicant did not provide short-term and long-term occurrences (i.e., short-term average rate of accumulation and total average rate of accumulation, respectively) of each transient as requested in Part (a) of RAI 4.3-2.

Issue:

Since the applicant used the 60-year transient projections to support the disposition of the time-limited aging analyses (TLAAs) evaluated in license renewal application (LRA) Sections 4.7.2 and 4.7.7, the staff requires additional information to determine whether the long-term and short-term weighting factors and the associated transient occurrences for these weighting factors used in the projection methodology is appropriate and conservative.

Request:

Provide the short-term average rate of accumulation and total average rate of accumulation for each transient listed in LRA Table 4.3-2 that supports the calculation of the 60-year projections.

RAI 4.3-3a

Background:

In response to Part (a) of RAI 4.3-3 dated October 11, 2012, the applicant stated it experienced 22 events of Normal Transient #16a, "[f]eedwater heaters out of service: One heater out of service," between 2000 and 2011. In its response to Part (b) of RAI 4.3-3, the applicant stated that in the past 9 years there have been 12 events of Normal Transient #16a and that a weighting factor of 1 for the long term and 3 for the short term was used. In addition, it was stated that the short-term period consists of the preceding 9 years.

Issue:

Based on the information provided, the staff noted that there were approximately 10 events of Normal Transient #16a that occurred from 2000 through 2001. Furthermore, LRA Table 4.3-2 states the 60-year projection is 106 cycles and the design-limiting value is 120 cycles. It is not clear to the staff whether using the occurrences from the preceding 9 years is conservative and represents the future trend for Normal Transient #16a, since the short-term occurrence would be 22 if a short-term period of 11 years was used. Since the applicant used the 60-year transient projections to support the disposition of the TLAAs evaluated in LRA Sections 4.7.2

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and 4.7.7, the staff requires this information to determine if the projection for Transient #16a is appropriate and conservative.

Request:

- a) Provide the yearly occurrence for Normal Transient #16a since the plant startup to 2011 to show the trend of this transient.
- b) Justify that the 60-year projection for Normal Transient #16a, using a short-term period of the preceding 9 years (2002-2011), is conservative considering that 10 events occurred from 2000 through 2001.

RAI 4.3-15a

Background:

In response to Part (b)(i) of RAI 4.3-15 dated October 11, 2012, the applicant stated that the letdown heat exchanger tubesheet cumulative usage factor (CUF) contribution by the "[]letdown flow decrease and return to normal" transient would increase from 0.169 [0.144+0.018+0.007] to 0.2535 [1.5x(0.144+0.018+0.007)]. In addition, it stated that this will increase the CUF from 0.910 to 0.995 and the response also provided the CUF contribution for each transient pair.

Issue:

Based on staff's review of Table 4 in the applicant's response to RAI 4.3-15, the CUF contribution from the 3rd transient pair "#6 []letdown flow decrease and return to normal (490°F to 290°F)" and "#6 []letdown flow decrease and return to normal (140°F to 380°F)" would increase to 0.224 [(0.144/1800)x2800]. Thus, the CUF contribution by the "[]letdown flow decrease and return to normal" transient would increase from 0.169 to 0.2615 [0.224+1.5x(0.018+0.007)], as opposed to the applicant's conclusion of 0.2535.

The staff noted that this will increase the CUF from 0.910 to over 1.00. The staff noted that the CUF value remains less than 1.0, which is the ASME Code Section III CUF requirement. The staff noted that the applicant must demonstrate that the re-calculated CUF value will be less than 1.0 through the period of extended operation to support the TLAA disposition in accordance with 10 CFR 54.21(c)(1)(ii).

Request:

Justify that the re-calculated CUF value is less than 1.0 assuming 3,000 cycles of "letdown flow decrease and return to normal" transient will occur through the period of extended operation.

RAI 4.7.9-5a

Background:

In its letter dated September 20, 2012, the applicant responded to RAI 4.7.9-5, which addresses whether the applicant's TLAA for steam generator tube wear adequately considers potential

effects of flow rate calculation errors or flow correction factor errors on steam generator tube wear.

In its response, the applicant stated that its analysis includes 2 percent for measurement uncertainties. The applicant also stated that to ensure that the plant remains within this uncertainty, plant instrumentation undergoes periodic surveillance and calibration and the uncertainty is incorporated into the setpoints. The applicant further stated that critical plant instrumentation whose failure could result in a violation of this uncertainty is incorporated into the plant's technical specifications and/or procedures.

Issue:

In its review of the applicant's response, the staff noted that the applicant did not clearly address how the 2 percent measurement uncertainty bounds the feedwater flow rate measurements. In addition, the staff seeks clarification regarding the inspection method and frequency used for the periodic surveillance of the feedwater flow meters.

The staff further needs confirmation as to whether Regulatory Issue Summary (RIS) 2007-24, "NRC Staff Position on Use of the Westinghouse CROSSFLOW Ultrasonic Flow Meter for Power Uprate or Power Recovery," dated September 27, 2007 (ADAMS Accession No. ML063450261), is an applicable concern for the applicant's flow measurement.

Request:

- a) Clarify what parameter in the applicant's analysis involves the 2 percent measurement uncertainty (e.g., reactor thermal power or feedwater flow rate). As part of the response, describe how the applicant's TLAA considers this uncertainty, in order to confirm that the uncertainty does not affect the assumptions or technical bases of the TLAA.
- b) Clarify what inspection method and frequency are used in the applicant's periodic surveillance for the feedwater flow meters. In addition, clarify why these inspections can ensure that aging degradation of the feedwater flow meters does not increase the uncertainty above the specified uncertainty range.
- c) Clarify whether the RIS 2007-24 is an applicable concern to the applicant's TLAA. Specifically, clarify whether the applicant uses the CROSSFLOW ultrasonic flow meter to calibrate the feedwater flow meters or to determine feedwater flow rates.

RAI 4.7.9-2a

Background:

In its letter dated September 20, 2012, the applicant responded to RAI 4.7.9-2, which addresses whether the estimated wear rate of the applicant's TLAA for steam generator tube wear is in agreement with the applicant's inspection results.

The applicant's response indicates that the total number of the steam generator tubes is 23,488, including one tube that was plugged pre-service. In its response, the applicant also stated that

that the anti-vibration bar (AVB) wear is the most active wear mechanism as observed by the steam generator tube inspections, which are described in the letter dated May 17, 2012. The applicant further stated that only 1 percent (232 tubes) of all the steam generator tubes show indications of AVB wear.

Issue:

In contrast with the total number (23,488) of the steam generator tubes described in the applicant's response, Table 1 in the applicant's letter dated May 17, 2012, indicates that the total number of the steam generator tubes is 22,144, including the tube plugged pre-service. Therefore, the staff needs clarification of the total number of steam generator tubes.

In addition, the applicant's response does not address the number of the steam generator tubes that show wear indications due to tube support plate wear. The staff needed to confirm whether a total of 258 steam generator tubes have wear indications due to AVB wear and tube support plate wear as described in the applicant's inspection report dated May 17, 2012.

Request:

Clarify the total number of steam generator tubes. In addition, confirm whether a total of 258 steam generator tubes have wear indications due to AVB wear and tube support plate wear as described in the applicant's inspection report dated May 17, 2012.

November 21, 2012

Mr. Adam C. Heflin
Senior Vice President
and Chief Nuclear Officer
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Sincerely,

/RA/

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

Docket No. 50-483

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ADAMS Accession No.: ML12320A517

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NAME	SCuadrado	IKing	DMorey	SCuadrado
DATE	11/19/21	11/19/2012	11/21/12	11/21/12

OFFICIAL RECORD COPY

Letter to A. Heflin from S. Cuadrado DeJesus dated November 21, 2012

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