

NRR-PMDAPEm Resource

From: Klos, John
Sent: Tuesday, October 31, 2017 1:46 PM
To: 'Telwood@ameren.com'
Cc: Klos, John
Subject: Requests for Additional Information concerning Callaway License Amendment - Thermal Overload Protection

Mr. Elwood,

By letter dated April 6, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17097A425), Union Electric Company, the licensee, dba Ameren Missouri submitted a License Amendment Request (LAR) for Callaway Plant Unit 1, which would revise the Final Safety Analysis Report (FSAR) description of Callaway's compliance with U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide (RG) 1.106, Revision 1, "Thermal Overload Protection for Electric Motors on Motor-Operated Valves."

The NRC staff has reviewed the LAR and has identified areas where additional information is needed to complete its review.

A clarification calls were held on October 26, 2017 and the final set of questions are below which require no further clarification. These RAIs are now released formally with an 85 calendar day response time; thereby, these RAIs are due January 24, 2018.

REQUEST FOR ADDITIONAL INFORMATION ASSOCIATED WITH LAR
CALLAWAY'S FSAR-DESCRIBED COMPLIANCE
WITH REGULATORY GUIDE 1.106
REGARDING MOV THERMAL OVERLOAD PROTECTION
(EPID NO. 000976/05000483/L-2017-LLA-0210)

Regulatory Requirements

Criterion 1 to Appendix A, "General Design Criteria for Nuclear Power Plants," Title 10, Part 50 of the Code of Federal Regulations (10 CFR Part 50) states, in part, that structures, systems, and components important to safety shall be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed.

The quality assurance program to be applied to safety-related components is described in Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, the NRC requires licensees to establish inservice testing (IST) programs in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, and more recently the ASME Code for Operation and Maintenance of Nuclear Power Plants.

In response to concerns regarding Motor Operated Valve (MOV) performance, the NRC staff issued Generic Letter (GL) 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance," dated June 28, 1989, which requested that nuclear power plant licensees and construction permit holders ensure the capability of MOVs in safety-related systems to perform their intended functions by reviewing MOV design bases, verifying MOV switch settings initially and periodically, testing MOVs under design-basis conditions where practicable, improving evaluations of MOV failures and necessary corrective actions, and trending MOV problems.

General Design Criteria (GDC) 18, "Inspection and Testing of Electric Power Systems," requires that electric power systems important to safety be designed to permit appropriate periodic inspection and testing to demonstrate operability and functional performance.

EEOB RAI-1

Callaway's License Amendment Request (LAR), Section 2.0, states that "the proposed change would revise the FSAR description of Callaway's compliance with NRC Regulatory Guide (RG) 1.106, Revision 1, "Thermal Overload Protection for Electric Motors on Motor-Operated Valves." Specifically, the FSAR will be revised to clarify how Callaway complies with RG 1.106 in regard to the control and/or bypassing of thermal overload protection (TOP) devices for MOVs during routine testing/maintenance activities of such valves. The change would allow TOP devices to remain bypassed during certain routine valve stroke surveillance testing (such that the TOP bypass jumpers are not removed during such testing), which is not in compliance with RG 1.106.

Since the TOP devices will not be available for detection of MOV degradation (age related or other maintenance related issues that contribute to overheating the motor windings), the staff requests the following additional information on the affected safety-related MOVs covered by the Generic Letter (GL) 89-10 program.

- a) The frequency of maintenance and maintenance testing (stroking) of the MOVs
- b) The frequency of dynamic testing of the MOVs
- c) The frequency of surveillance testing of a sample of MOVs in different systems
- d) A summary of MOV diagnostic test results over last three operating cycles.
- e) In response to GL 96-05, Callaway established a 25 percent margin criterion between the thrust required to operate individual torque-controlled and the thrust delivered by the MOV motor actuator to evaluate age-related valve degradation. Please provide details (failure modes and corrective actions) on any valves that failed this criterion since the closeout of GL 96-05.

EEOB RAI-2

The LAR's Section 3. Technical Evaluation, states "the proposed change (described in Section 2.1) would allow bypassing of TOPs during surveillance stroke tests of MOVs when the risk of motor damage to the valve is low." In Section B, RG 1.106, Revision 1, it states that "when TOP are bypassed, it is important to ensure that the bypassing does not result in jeopardizing the completion of the safety function or in degrading other safety systems because of any sustained abnormal motor circuit currents that may be present." Please identify the type of surveillance (quarterly) tests during which the TOP devices will be bypassed.

EEOB RAI-3

The LAR's Technical Evaluation section states "the proposed change would allow bypassing of TOPs during surveillance stroke tests of MOVs when the risk of the motor damage is low." It also states "removing thermal overload bypass jumpers for surveillance stroke tests, during which motor damage is of low probability, may carry more risk with respect to ensuring that the valves can carry out their safety function of stroking as required during an accident."

Please provide a justification and basis for why the testing in maintenance activities will have a high risk of motor damage compared to surveillance tests having low risk of damage.

EEOB RAI-4

The LAR states that there is an inherent risk of removing and re-installing thermal overload jumpers in that they may not be re-installed properly. Removing thermal overload bypass jumpers for surveillance stroke tests, during which motor damage is of low probability, may carry more risk with respect to ensuring that the valves can carry out their safety function of stroking as required during an accident.

- a) Please provide a discussion of the Callaway operating experience (OE) or industry OE regarding MOV (motor) failures during operation as a result of maintenance activities.
- b) In your discussion, describe any actions (e.g., installation of switches to block the bypass circuit such that jumpers do not have to be installed or removed, etc.) that can be performed by the plant to alleviate concerns associated with removal and reinstallation of jumpers.

EEOB RAI-5

The LAR states that there are 670 valve strokes tests each operating cycle. Based on Callaway OE, how many of the stroke tests failed to meet the acceptance criteria and contributed to MOV motor degradation or caused motor damage during the last 5 years? How many safety-related MOVs will be involved in each operating cycle? How many safety-related MOVs will have a frequency of 18 months and quarterly?

John Klos

DORL Callaway, Columbia Project Manager

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