

From: Mahesh Chawla
Sent: Thursday, July 27, 2023 9:42 AM
To: Elwood, Thomas B
Cc: Jennifer Dixon-Herrity; Shilp Vasavada; Marie Pohida; Keith Tetter; Andrew Mihalik; Hanry Wagage; Gordon Curran; Matthew Hamm; Vijay K Goel; Summer Sun; Vic Cusumano; Phillip Sahd; Brian Wittick; Wendell Morton
Subject: Callaway Plant, Unit No. 1 - Regulatory Audit Questions - LAR to Clarify Support System Requirements for the Residual Heat Removal & Control Room Air Conditioning Systems (EPID L-2022-LLA-0176)
Attachments: Callaway audit questions L-2022-LLA-0176.docx

Dear Mr. Elwood,

By application dated December 1, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22335A507), Union Electric Company, doing business as Ameren Missouri (the licensee), submitted a license amendment request (LAR) for Callaway Plant, Unit No. 1. The proposed amendment request is submitted for NRC approval of a change (clarification) to the plant's licensing basis, i.e., the Technical Specification (TS) Bases and FSAR, to allow use of one train of the normal, non-safety related Service Water system to solely provide cooling water support for one of two redundant trains of TS-required equipment when both equipment trains are required to be Operable during cold shutdown/refueling conditions. The supported equipment/systems affected by the proposed change are the Residual Heat Removal system and Control Room Air Conditioning system, as applicable during Modes 5 and 6. The applicable/affected TS Limiting Conditions of Operation (LCOs) are TS LCO 3.4.8, "RCS Loops – Mode 5, Loops Not Filled," TS LCO 3.7.11, "Control Room Air Conditioning System (CRACS)," and TS LCO 3.9.6, "Residual Heat Removal (RHR) and Coolant Circulation – Low Water Level."

On March 28, 2023 (ML23065A321), the U.S. Nuclear Regulatory Commission (NRC) staff issued a letter indicating their plans for a regulatory audit and setup of online reference portal request to the licensee. The audit plant included the request for documents and the audit questions from the NRC staff. The regulatory audit was conducted from April 11 through 12, 2023, during which licensee provided the pertinent information for the subject application. The NRC staff has developed following additional audit questions (attached), for which they would like the licensee to provide the requested information.

Contact me to arrange a teleconference with the NRC staff to provide your response to this request. Thanks

Sincerely,

Mahesh Chawla, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
ph: 301-415-8371
Docket No. 50-483

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MChawla	JDixon- Herrity
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Received Date: 7/27/2023 9:42:00 AM
From: Mahesh Chawla

Created By: Mahesh.Chawla@nrc.gov

Recipients:

"Jennifer Dixon-Herrity" <Jennifer.Dixon-Herrity@nrc.gov>

Tracking Status: None

"Shilp Vasavada" <Shilp.Vasavada@nrc.gov>

Tracking Status: None

"Marie Pohida" <Marie.Pohida@nrc.gov>

Tracking Status: None

"Keith Tetter" <Keith.Tetter@nrc.gov>

Tracking Status: None

"Andrew Mihalik" <Andrew.Mihalik@nrc.gov>

Tracking Status: None

"Henry Wagage" <Henry.Wagage@nrc.gov>

Tracking Status: None

"Gordon Curran" <Gordon.Curran@nrc.gov>

Tracking Status: None

"Matthew Hamm" <Matthew.Hamm@nrc.gov>

Tracking Status: None

"Vijay K Goel" <Vijay.Goel@nrc.gov>

Tracking Status: None

"Summer Sun" <Summer.Sun@nrc.gov>

Tracking Status: None

"Vic Cusumano" <Victor.Cusumano@nrc.gov>

Tracking Status: None

"Phillip Sahd" <Phillip.Sahd@nrc.gov>

Tracking Status: None

"Brian Wittick" <Brian.Wittick@nrc.gov>

Tracking Status: None

"Wendell Morton" <Wendell.Morton@nrc.gov>

Tracking Status: None

"Elwood, Thomas B" <TElwood@ameren.com>

Tracking Status: None

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Regulatory Basis

When a licensee proposes to use a nonsafety-related system for a limited duration to address the unavailability of a corresponding safety-related system, typically compensatory measures are identified and to a certain extent, are incorporated into the Technical Specifications (TS). These compensatory measures are intended to minimize challenges to the nonsafety-related system and to pre-stage mitigating measures as appropriate. For example, in NUREG-0800, Branch Technical Position 8-8, "Onsite (Emergency Diesel Generators) And Offsite Power Sources Allowed Outage Time Extensions" (ADAMS Accession No. ML113640138), discusses the use of an alternate power source and lists expected compensatory measures. Likewise, an appropriate duration and compensatory measure might aid in justifying the use of the nonsafety-related service water system (SWS) for the safety-related essential water system (ESW), based on the following considerations:

1. Based on staff review of operating pressurized water reactor (PWR) and advanced PWR low power and shutdown probabilistic risk assessments, the staff recognizes the increased risk associated given a postulated loss of residual heat removal (RHR) when (1) the reactor coolant system (RCS) is breached and the steam generators cannot be used for decay heat removal and (2) reduced inventory operation when the time to RCS boiling is short requiring short times for operator actions such as inventory addition and containment closure. Industry guidance and key shutdown voluntary initiatives are addressed in NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management," December 1991 (as referenced in RG 1.201 for 10 CFR 50.69 and in SECY 97-168). NUMARC 91-06 states, "Activities which may impact the core cooling system/components should be scheduled during periods of low decay heat or maximum coolant inventory or during defueled conditions. If such activities must be scheduled during periods of high decay heat or REDUCED INVENTORY (defined as three feet below the reactor vessel flange), then CONTINGENCY PLANS should be established."
2. In case of a Loss of Offsite Power, SWS will not have an alternate power supply, while one ESW train can be supplied by at least one required emergency diesel generator (EDG).
3. Regulatory Issue Summary 2013-05, "NRC Position on the Relationship Between General Design Criteria and Technical Specification Operability," states that "[I]t is the staff's position that failure to meet GDC [General Design Criteria], as described in the licensing basis (e.g., nonconformance with the CLB [Current Licensing Basis] for protection against flooding, seismic events, tornadoes) should be treated as a nonconforming condition and is an entry point for an operability determination if the nonconforming condition calls into question the ability of SSCs to perform their specified safety function(s) or necessary and related support function(s)." 10 CFR 50.36 (c)(2)(i) states: "Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility." TS Limiting Condition for Operation (TS LCO) 3.4.8 (Mode 5, Loops Not Filled) and TS LCO 3.9.6 (Mode 6 with water level < 23 feet above the top of reactor vessel flange) require that two RHR loops shall be operable, and one RHR loop shall be in operation.

The definition of OPERABLE in Callaway TS states: A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water,

lubrication, and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).

The nonsafety-related SWS and its support systems (such as nonsafety-related alternating current (AC) power) are not specifically analyzed for protection from hazards and events such as tornadoes, internal and external floods, missiles, pipe breaks, internal fires, and seismic events compared to the ESW system.

4. The license amendment request (LAR) does not provide qualitative or quantitative risk information to support the use of a nonsafety-related system without alternative power supplies. While such risk information is not expected for shutdown conditions, risk-information is typically provided to justify extended outage times. A limited duration and compensatory measures would somewhat constrain the risk, even if it can't be formally evaluated.

Audit Questions

Given the foregoing discussion, discuss the appropriate duration and compensatory measures for using the non-safety related SWS to address the unavailability of one train of safety-related ESW to maintain two trains of operable RHR during operations while in low vessel inventory and identify those that should be included in TS, for example in a note or by reference. This discussion should address the following considerations.

1. Discuss the expected duration of one train of ESW outage. Discuss why an ESW outage must take place during reduced inventory conditions as opposed to periods of greater coolant inventory consistent with industry guidance. Additional justification would be needed for no duration limits or for unusually long duration limits (no justification was provided in the LAR).
2. Describe the compensatory measures to protect the nonsafety-related SWS and its support systems (such as nonsafety-related AC power) from internal hazards such as internal fires, internal floods, and operator error, which can occur due to maintenance during shutdown.
3. Describe what compensatory measures will be taken if severe weather is predicted since the nonsafety-related SWS and its support systems are not protected against high winds and other external hazards.
4. Accumulator injection is listed by the licensee as a defense-in-depth makeup method for adding water to the RCS in response to prior audit questions 7 and 14. Given the nitrogen cover gas in the accumulator, please discuss the results of analysis to show that, for the configuration proposed in the LAR, the entrainment of nitrogen in the RCS does not impact RCS level instrumentation, RHR function in decay heat removal mode, or mitigation of a loss or interruption of RHR, especially during a reduced inventory condition.