

## **NRR-PMDAPEm Resource**

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**From:** Kuntz, Robert  
**Sent:** Tuesday, October 11, 2016 3:33 PM  
**To:** Loeffler, Richard A.  
**Subject:** Plan for the audit related to the Monticello ILRT amendment request  
**Attachments:** Monticello ILRT audit plan.docx

Mr. Loeffler,

Attached is the plan for the audit to be conducted Thursday October 13 and Friday October 14, 2016.

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**Recipients:**  
"Loeffler, Richard A." <Richard.Loeffler@xenuclear.com>  
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**AUDIT PLAN ON CONTAINMENT ACCIDENT PRESSURE**  
**FOR MONTICELLO LICENSE AMENDMENT REQUEST: “REVISE TECHNICAL**  
**SPECIFICATION 5.5.11**  
**TO PROVIDE A PERMANENT EXTENSION OF THE INTEGRATED LEAKAGE RATE (TYPE**  
**A) TEST FREQUENCY FROM TEN TO FIFTEEN YEARS”**

**1. BACKGROUND**

Xcel Energy provided a license amendment request (LAR) (Reference 1) to the U.S. Nuclear Regulatory Commission (NRC), dated February 10, 2016, to revise Technical Specification 5.5.11 to provide a permanent extension of the integrated leakage rate (Type A) test frequency from ten to fifteen years for the Monticello Nuclear Generating Plant (MNGP). According to the LAR, containment overpressure is required for emergency core cooling system (ECCS) performance. The LAR included a risk assessment of containment accident pressure (CAP), i.e., containment overpressure, in accordance with the NRC staff safety evaluation on the Nuclear Energy Institute (NEI) Topical Report (TR) 94-01, Revision 2 (Reference 2).

The NRC staff's review of the LAR has commenced in accordance with the Office of Nuclear Reactor Regulation's (NRR) Office Instruction LIC-101, "License Amendment Review Procedures." The NRC staff has determined that a regulatory audit of the Monticello LAR should be conducted in accordance with the NRR Office Instruction LIC-111, "Regulatory Audits," for the staff to gain a better understanding of the licensee's CAP risk assessment in the LAR.

A regulatory audit is a planned, license or regulation-related activity that includes the examination and evaluation of primarily non-docketed information. A regulatory audit is conducted with the intent to gain understanding, to verify information, and/or to identify information that will require docketing to support the basis of the licensing or regulatory decision. Performing a regulatory audit of the licensee's information is expected to assist the staff in efficiently conducting its review or gain insights on the licensee's processes or procedures. Information that the NRC staff relies upon to make the safety determination must be submitted on the docket. However, there may be supporting information retained as records under Title 10 of the *Code of Federal Regulations* (10 CFR) 50.71 maintenance of records, making of reports and/or 10 CFR 54.37 additional records and record-keeping requirements, which although not required to be submitted as part of the licensing action, would help the staff better understand the licensee's submitted information.

In support of the LAR review, NRC's Office of Nuclear Regulatory Research (RES) performed CAP-related calculations using the methodology documented in a report entitled, "Containment Accident Pressure Credit Risk Assessments for Selected Plants," (Reference 3). These

ENCLOSURE

calculations were based on a semi-Markov model and used information from the LAR to provide risk insights for the CAP-related large early release frequency (LERF).

The objectives of this regulatory audit are to:

- Gain a better understanding of the analyses and bases underlying the CAP risk assessment in the LAR,
- Discuss the results of an NRC Office of Nuclear Regulatory Research (RES) calculations on CAP, and
- Identify further information that is necessary for the licensee to submit in order for staff to reach a licensing or regulatory decision and formulate requests for additional information (RAIs).

## **2. REGULATORY AUDIT BASES**

The bases for this audit include the licensee's LAR (Reference 1) and the NRC staff's safety evaluation of NEI 94-01, Revision 2 (Reference 2). Section 4.2 limitation and condition number 4 of this safety evaluation states that a LAR is required in instances where containment over-pressure is relied upon for ECCS performance. In addition, Regulatory Guide 1.200 (Reference 4) provides regulatory guidance on probabilistic risk assessment technical adequacy.

## **3. REGULATORY AUDIT SCOPE**

The audit will include discussions on the licensee's and NRC's CAP risk assessment, on the key uncertainties and assumptions in the CAP risk assessment and the draft RAIs.

### **CAP Assessment Discussion**

- Semi-Markov analysis (NRC)
  - Approaches and technical aspects
    - Scope of initiating events and conditions
    - Risk Insights
- Linked fault tree analysis (XcelEnergy)
  - Approaches and technical aspects
    - Scope of initiating events and conditions
    - Basis for CAP approach

### Key Assumptions and Key Sources of Uncertainty<sup>1</sup> Discussion

- Cooling temperature for the lube oil of the high pressure injection pumps
- Systems available for injection upon loss of instrument air initiating event
- Containment failure rate for containment failures with leakage rates,  $S$ , greater than  $1 L_a$ ,  $\lambda(S \geq 1 L_a)^2$
- Any key assumptions or key sources of uncertainty for the CAP risk assessment in the LAR

### Discuss CAP-related additional information

The NRC staff safety evaluation report (SER), dated June 25, 2008, for NEI TR 94-01, Revision 2 included an evaluation of the guidance in Electric Power Research Institute (EPRI) Report No. 1009325, Revision 2. This SER stated: "Section 4.2.6 of EPRI Report No. 1009325, Revision 2, includes guidance for licensees that operate plants that rely on containment over-pressure for NPSH [Net Positive Suction Head] or ECCS [Emergency Core Cooling Systems] injection, and that may experience an increase in CDF as a result of the proposed change in the ILRT interval."

It is not clear that Section 5.3.4 of Enclosure 2 to the LAR is consistent with the guidance in Section 4.2.6 of EPRI Report No. 1009325, Revision 2. The EPRI guidance provides the following examples:

- LOCA scenarios where the initial containment pressurization helps to satisfy the NPSH requirements for early injection
- Total loss of containment heat removal scenarios where gradual containment pressurization helps to satisfy the NPSH requirements for long-term use of an injection system from a source inside containment

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<sup>1</sup> Based on RG 1.200:

*A key assumption* is one that is made in response to a key source of model uncertainty in the knowledge that a different reasonable alternative assumption would produce different results, or an assumption that results in an approximation made for modeling convenience in the knowledge that a more detailed model would produce different results. For the base PRA, the term "different results" refers to a change in the risk profile (e.g., total CDF and total LERF, the set of initiating events and accident sequences that contribute most to CDF and to LERF) and the associated changes in insights derived from the changes in the risk profile. A "reasonable alternative" assumption is one that has broad acceptance within the technical community and for which the technical basis for consideration is at least as sound as that of the assumption being challenged.

*A key source of uncertainty* is one that is related to an issue in which there is no consensus approach or model and where the choice of approach or model is known to have an impact on the risk profile (e.g., total CDF and total LERF, the set of initiating events and accident sequences that contribute most to CDF and to LERF) such that it influences a decision being made using the PRA. Such an impact might occur, for example, by introducing a new functional accident sequence or a change to the overall CDF or LERF estimates significant enough to affect insights gained from the PRA.

<sup>2</sup> This frequency is described in Reference 3

The LAR Section 5.3.4 of Enclosure 2 refers to “LOCA initiators,” which is not necessarily the same as a LOCA scenario (when the LOCA is not the initiating event). LOCA initiators in Table 5-1 of the LAR are a relatively small contributor to the internal events CDF. However, other internal events initiators (e.g., transients) or conditions (e.g., station blackout) could result in a consequential LOCA. In addition, it is not clear whether the scenarios involve early or long-term injection.

- a. The EPRI guidance would suggest a broader set of scenarios than the two provided in the LAR. Explain why the two scenarios described in Section 5.3.4 of the LAR are sufficient for the containment accident pressure sensitivity analysis given the EPRI guidance.
- b. In addition, Table 5-22 of the LAR shows risk contribution from internal events and fire events. Explain why external events are not included in the sensitivity analysis for CAP.
- c. Update your sensitivity analyses as appropriate for parts a and b, following the NRC-approved guidance in EPRI Report No. 1009325, Revision 2, and provide the results. If an update is performed, explain it and how it is sufficient to evaluate the containment accident pressure risk for the application.

#### **4. INFORMATION AND OTHER MATERIAL NECESSARY FOR THE REGULATORY AUDIT**

The NRC audit team will require access to licensee personnel knowledgeable in the CAP risk assessment included in the LAR.

##### Documentation

- License Amendment Request

##### Documentation or Presentation

- Related to XcelEnergy PRA analysis of CAP
- Related to modeling/assessment of the key assumptions or key uncertainties to support the PRA analysis of CAP. These should include cooling temperature for the lube oil of the high pressure injection pumps, systems available for injection upon loss of instrument air initiating event (include addressing the main feedwater system availability)

#### **5. AUDIT TEAM**

The audit will be conducted by the following NRC staff from the Office of Nuclear Reactor Regulation (NRR) Division of Risk Assessment, PRA Licensing Branch (APLA) and from the Office of Nuclear Regulatory Research (RES) Division of Risk Analysis (DRA):

Dan O’Neal, NRC/NRR/APLA  
Mihaela Biro, NRC/NRR/APLA  
Martin Stutzke, NRC/RES/DRA  
Anders Gilbertson, NRC/RES/DRA  
Robert Kuntz, NRC/NRR/DORL

## **6. LOGISTICS/SCHEDULE**

The audit will be conducted on Thursday October 13, 2016 and Friday October 14, 2016 with potential additional audit activities at a later date. The October 13, 2016 and October 14, 2016 audit will be conducted at the Bethesda North Marriott Hotel and Conference Center, 2701 Marinelli Road, North Bethesda, Maryland 20852.

## **7. SPECIAL REQUESTS**

None.

## **8. DELIVERABLES**

A regulatory audit summary will be issued within approximately 90 days after the completion of the audit. The summary will use the guidance of Nuclear Reactor Regulation Office Instruction LIC-111 for content. Formal RAIs will be sent separately to the licensee after the completion of the audit. The audit summary will be made publically available in Agencywide Documents Access and Management System (ADAMS).

## **9. REFERENCES**

1. Letter from XcelEnergy to the U.S. Nuclear Regulatory Commission, "License Amendment Request: "Revise Technical Specification 5.5.11 to Provide a Permanent Extension of the Integrated Leakage Rate (Type A) Test Frequency from Ten to Fifteen Years," dated February 10, 2016 (ADAMS Accession No. ML16047A336).
2. NRC Final Safety Evaluation Report, "Final Safety Evaluation for Nuclear Energy Institute (NEI) Topical Report (TR) 94-01, Revision 2, 'Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J' and Electric Power Research Institute (EPRI) Report No. 1009325, Revision 2, August 2007, Risk Impact Assessment of Extended Integrated Leak Rate Testing Intervals," US Nuclear Regulatory Commission, Washington, DC, June 25, 2008 (ADAMS Accession No. ML081140105)
3. "Containment Accident Pressure Credit Risk Assessments for Selected Plants," dated October 2012 (ADAMS No. ML12234A561).
4. Regulatory Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," Revision 2, March 2009 (ADAMS Accession No. ML090410014).