Constellation

Limerick

One-Time Extension of Type A (ILRT) LAR

June 26, 2025

Agenda

- Introductions
- Meeting Objectives
- Background Information
- Scope of Technical Specification Changes
- Justification
- Review of Proposed LAR Submittal
- Overview of Submittal Schedule
- Summary and Wrap-up
- Questions

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Introductions

Corporate Licensing Engineers – Ronnie Reynolds, Lane Oberembt

Corporate Licensing Senior Manager – Wendi Para

Corporate/Limerick Risk Engineer – Connelly Richards

Limerick Regulatory Assurance Manager – Jordan Rajan

Limerick Regulatory Assurance Engineers – George Budock, Renee Guy

Corporate Engineering – Brian Mast, Mark Weis

Limerick Appendix J Engineering – Evan Dimmerling

Limerick Coatings Engineer – Lorrha Hitchner

Limerick Digital Modernization Project Team Members – Brian Devine, Steve Hesse, Scott Schumacher, Brian Wysowski

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Meeting Objectives

- Present information to the NRC to provide a clear understanding of the proposed Limerick License Amendment Request (LAR)
  - One-time extension to Technical Specification (TS) 6.8.4.g “Primary Containment Leakage Rate Testing Program” and corresponding extension of TS 4.6.2.1.e “Drywell-to-Suppression Chamber Bypass Leak Test (DWBT)”
- Justify how the extension supports the safe and efficient installation of the Digital Modernization Project (DMP) during a non-typical refueling outage.
- Obtain feedback from the NRC on the proposed LAR to ensure a high-quality submittal and support efficient use of resources, both NRC & Constellation.
- Establish a mutual understanding of the proposed schedule and corresponding need date to ensure adequate NRC resource availability

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Background Information

- The LGS Digital Modernization Project will replace the existing analog control logic hardware of the Reactor Protection System (RPS) instrumentation, Nuclear Steam Supply Shutoff System (NSSSS) instrumentation, the Emergency Core Cooling System (ECCS) instrumentation, the Reactor Core Isolation Cooling (RCIC) system instrumentation, and the End-of-Cycle Recirculation Pump Trip system (EOC-RPT) instrumentation with a new single digital control system.
- Limerick Digital Modernization Project is currently scheduled for implementation during the spring of 2026 and 2027 (Li1R21 & Li2R19, respectively).

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Background Information cont.

- TS 3/4.6.1.2 requires the overall integrated leakage rate test Type A to be performed in accordance with the Primary Containment Leakage Rate Testing Program, described in TS 6.8.4.g.
- TS 3/4.6.2.1.e requires the drywell-to-suppression chamber bypass leak test to coincide with the Type A test.
- TS 6.8.4.g requires the Primary Containment Leakage Rate Testing Program to be in accordance with NEI 94-01, Rev. 3-A, dated July 2012, and the Limitations and Conditions specified in NEI 94-01, Rev. 2-A, dated October 2008.
- Limerick TS Amendments 241/204 (U1/U2) extended the interval between Type A tests from 10 years to 15 years and updated the associated references.
  - The U1 ILRT last performed in March 2012 and due March 2027; scheduled April 2026 (Li1R21).
  - The U2 ILRT last performed in April 2013 and due April 2028; scheduled April 2027 (Li2R19).

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Scope of Technical Specification Changes

- The LAR for a one-time extension to TS 6.8.4.g is proposing a change to Limerick TS 6.8.4.g to extend the performance of the next Type A test to no later than April 2028 for Unit 1 (13-month extension) and April 2029 for Unit 2 (12-month extension).
  - This would also extend the drywell-to-suppression chamber bypass leak test since this test is performed with the Type A test.
- In addition, the proposed change would allow the Type A test to be extended indefinitely if the test interval ends while primary containment integrity is not required (i.e., TS 3.6.1, "Primary Containment," does not require the primary containment to be operable in Modes 4 and 5). In this case, the Type A test would be performed prior to entering Mode 2.
- The proposed change would also administratively update the impacted TS Sections with minor formatting changes to align Unit 1 and Unit 2 TS requirements.

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Justification

- The DMP will be the largest analog to digital upgrade of the safety-related Plant Protection Systems (PPS) at an operating nuclear plant.
  - ~ 1800 safety-related components being replaced by software functionalities.
  - ~ 3000 procedure changes (operational, maintenance, IST, etc.) required
- In support of extensive work planned, LGS requested and received NRC approval to disable the Redundant Reactivity Control Systems (RRCS) 30 days prior to start of DMP outage (ML24151A384).

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Justification cont.

- Following DMP installation, the site will perform the Modification Acceptance Test (MAT):
  - ~ 500 iterations of plant line-ups, logic tests, pump starts, valve strokes, etc. to justify PPS operability.
  - The MAT will be performed in Modes 5 & 2
- ILRT also requires revision because of changes to components that are being modified by the DMP and would be performed in Mode 4.

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Justification cont.

- Independent risk assessment determined that increasing the interval between ILRTs from 15 to 16.25 years resulted in a risk increase that fell well below the “very small” risk change as defined in RG 1.174.
- Prior performance of Type A (ILRT) tests have confirmed that the containment is acceptable with considerable margin to the TS acceptance criteria.
- Type B and Type C tests (part of the Primary Containment Leakage Rate Program but not being modified with this LAR) have also demonstrated acceptable results.
- Various Containment Inspection Programs including the Protective Coatings Program (both Drywell and Suppression Pool) and In-Service Inspection Programs (Liner, Concrete, Penetrations) have shown continuing acceptable results.
- No modifications requiring a post-maintenance verification Type A test are planned prior to the Spring 2028 (U1) and Spring 2029 (U2) refueling outages.

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Review of Proposed LAR Submittal

Unit 1

g. Primary Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54 (o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR 50, Appendix J," Revision 3-A, dated July 2012, and the Limitations and Conditions specified in NEI 94-01, Revision 2-A, dated October 2008. The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is 44.0 psig.

Insert A

Start new paragraph

The maximum allowable primary containment leakage rate, L_a, at P_a, shall be 0.5% of primary containment air weight per day.

Insert A

as modified by the following exemptions: (1) the next Type A test performed after the March 2012 Type A test shall be performed no later than April 30, 2028, and (2) if the Type A test has not been performed by April 30, 2028, and the unit is in Mode 4 or 5, the Type A test shall be performed prior to entering Mode 2.

Unit 2

g. Primary Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54 (o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR 50, Appendix J," Revision 3-A, dated July 2012, and the Limitations and Conditions specified in NEI 94-01, Revision 2-A, dated October 2008.

Insert B

The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is 44.0 psig.

The maximum allowable primary containment leakage rate, L_a, at P_a, shall be 0.5% of primary containment air weight per day.

Insert B

as modified by the following exemptions: (1) the next Type A test performed after the April 2013 Type A test shall be performed no later than April 30, 2029, and (2) if the Type A test has not been performed by April 30, 2029, and the unit is in Mode 4 or 5, the Type A test shall be performed prior to entering Mode 2.

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Overview of Submittal Schedule

- Pre-submittal Meeting with NRC to Discuss LAR – June 26, 2025
- LAR submittal by CEG by early July 2025
- Request NRC approval by March 31, 2026, to support implementation of the Digital Modernization Project changes in Li1R21 (spring 2026) and Li2R19 (spring 2027).
- Performance of the next ILRT Type A test in Li1R22 (spring 2028) and Li2R20 (spring 2029).

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Summary and Wrap-up

- Extend Type A (ILRT) interval by 13 months for Unit 1 and 12 months for Unit 2 to allow Limerick to focus on the safe and efficient installation of the Digital Modernization Project.
- Performance of the Type A tests during the refueling outages in Li1R22 (spring 2028) and Li2R20 (spring 2029).
- Continue to perform other scheduled inspections in support of Primary Containment Leakage Rate Testing Program as planned during upcoming refueling outages.

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Questions?

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Supplemental Information

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Supplemental Information

LCO 3.6.1.2

CONTAINMENT SYSTEMS

PRIMARY CONTAINMENT LEAKAGE

LIMITING CONDITION FOR OPERATION

3.6.1.2 Primary containment leakage rates shall be limited to:

a. An overall integrated leakage rate (Type A Test) in accordance with the Primary Containment Leakage Rate Testing Program.

SR 3/4.6.2.1.e

e. Drywell-to-suppression chamber bypass leak tests shall be conducted to coincide with the Type A test at an initial differential pressure of 4 psi and verifying that the $A/\sqrt{k}$ calculated from the measured leakage is within the specified limit. If any drywell-to-suppression chamber bypass leak test fails to meet the specified limit, the test schedule for subsequent tests shall be reviewed and approved by the Commission. If two consecutive tests fail to meet the specified limit, a test shall be performed at least every 24 months until two consecutive tests meet the specified limit, at which time the test schedule may be resumed.

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Supplemental Information cont.

TS 6.8.4.g

g. Primary Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54 (o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR 50, Appendix J," Revision 3-A, dated July 2012, and the Limitations and Conditions specified in NEI 94-01, Revision 2-A, dated October 2008. The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is 44.0 psig.

The maximum allowable primary containment leakage rate, L_a, at P_a, shall be 0.5% of primary containment air weight per day.

Leakage rate acceptance criteria are:

a. Primary Containment leakage rate acceptance criterion is less than or equal to 1.0 L_a. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are less than or equal to 0.60 L_a for the Type B and Type C tests and less than or equal to 0.75 L_a for Type A tests;

b. Air lock testing acceptance criteria are:

   1) Overall airlock leakage rate is less than or equal to 0.05 L_a when tested at greater than or equal to P_a.

   2) Seal leakage rate is less than or equal to 5 scf per hour when the gap between the door seals is pressurized to 10 psig.

The provisions of Specification 4.0.2 do not apply to the test frequencies specified in the Primary Containment Leakage Rate Testing Program.

The provisions of Specification 4.0.3 are applicable to the tests described in the Primary Containment Leakage Rate Testing Program.

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