

**Status of Technical Issues  
and Update on Review Schedule  
for the  
Limerick Digital I&C  
License Amendment Request**

**Public Meeting**  
September 6, 2024

# Topics

## **Open Portion of Meeting**

- Equipment Qualification Information
- Conformance with System Development Process
- Basic Component Interface Module (CIM) Information
- Review Schedule Update

## **Closed Portion of Meeting**

- Detailed Design Characteristics of the CIM

# Purpose

- Discuss issues concerning the NRC staff's review of the Limerick license amendment request.
  - Communicate any identified information needs that exist in the submittals that pertain to equipment qualification, system development process, and component interface module (CIM) that are necessary to support the safety determination in the staff's safety evaluation (SE).
- Provide an update on the review schedule for the license amendment request.

# Equipment Qualification Information

- Responses to RAIs on equipment qualification (EQ) received on May 3, 2024, indicated the incomplete EQ work for the following three areas:
  - New fiber optic cables used as high-speed links between safety divisions of the Plant Protection System (PPS)
  - Class1E to non-Class1E system isolation barriers
  - Different or upgraded equipment for the Common-Q based PPS
- The missing EQ information is expected to be submitted at a later date, as verbally communicated by the licensee to NRC.

# Equipment Qualification Information

## **Purpose of EQ:**

To reduce the potential for common cause failure (CCF) due to environmental, EMI/RFI, and seismic effects and to demonstrate that the safety-related I&C equipment can perform its designated safety functions during and after a design basis event. Considering its safety significance, the safety-related I&C equipment must be qualified before being installed and used in a safety-related I&C system.

# Equipment Qualification Information

- Applicable regulatory requirements:
  - 10 CFR 50.49
  - IEEE Std. 279 of 10 CFR 50.55a(h)
  - GDC 2, and 4
- Applicable regulatory guidance:
  - Regulatory Guide (RG) 1.75, “Criteria for Independence of Electrical Safety Systems”
  - RG 1.100, “Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants”
  - RG 1.180, “Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems”
  - RG 1.209, “Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants”

# Conformance with System Development Process

- The NRC staff performed a regulatory audit (August 19 to 30, 2024) of the system development activities and vendor oversight activities related to the Limerick Plant Protection System digital upgrade.
- The purpose of this audit was to enable the NRC staff to gain understanding, verify information, and identify information that may be required to support a safety determination in our safety evaluation (SE).
- The NRC staff was able to meet the audit goals.
- No open items came out of this audit.
- At this moment, the staff has not identified any material to be docketed.

# Component Interface Module (CIM) Design Information

- The CIM System is a critical common link in the safety-related digital I&C system architecture that acts as a ‘priority module’ whose safety-related function is being shared by the:
  - Safety-related Common Q-based plant protection system (PPS)
  - Non-safety-related Ovation-based distributed control system (DCS), and
  - Non-safety-related diverse protection system (DPS) (which is also part of the DCS)
- The staff is finalizing its safety evaluation conclusions with regards to defense in depth and diversity (D3) of the CIM System.



# Component Interface Module (CIM) Design Information

- The NRC staff's evaluation of the CIM System's design and testing attributes related to D3 is based on review criteria contained in BTP 7-19\* (which addresses GDC-22\*\*) that support the licensee's claim that the CIM system is not susceptible to a CCF.
- The staff identified that the necessary information to make a safety conclusion has not been provided on the docket.

\*BTP 7-19 – Guidance for Evaluation of Diversity and Defense-in-Depth in Digital Computer-Based Instrumentation and Control Systems

\*\*GDC 22 – 10 CFR Part 50, Appendix A General Design Criterion 22, "Protection system independence".

# Review Schedule Update

- Because of repeated delays in providing the EQ information, and emergent challenges regarding the CIM System evaluation, the NRC staff will not complete the review by December 9, 2024.
- The NRC staff will continue with routine communications concerning the Limerick digital I&C LARs.
- After Constellation has submitted the information to address EQ and CIM challenges, the NRC staff will provide Constellation with an updated estimated completion schedule.

# Questions?