Constellation

Limerick Generating Station Digital Modernization Project Acceptance Review Follow-up on IEEE-603 Compliance Issues

December 15, 2022

CEG Participants

- Licensing
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Opening Remarks

- NRC
- CEG

Acceptance Review Letter- IEEE 603 Compliance

- *"Items 2 and 3: Exceptions to IEEE-603-1991*
- *At the public meeting, the staff noted that the IEEE-603-1991 clauses that Constellation is taking exception to correspond to similar requirements in IEEE Standard 279-1968 that are required to be met for proposed protection systems at Limerick in accordance with 10 CFR 55.55a(h)(2). Taking exception to the clauses in IEEE-603-1991 would seem to indicate that the system planned for Limerick would not comply with 10 CFR 55.55 a(h)(2), in which case the system could not be approved without additional licensing actions (e.g., requesting an exemption or alternative request). As justification for the exception, the LAR references, and Constellation discussed at the public meeting, Limerick's updated final safety analysis report (UFSAR) and emergency operating procedures. However, the staff could not identify a clear regulatory basis for the exceptions in these references during the acceptance review period.*
- *While follow up is necessary to determine if the licensing basis documents provide sufficient justification, the staff concluded that resolution of these issues was not necessary to support acceptance of the LAR because Constellation had provided a justification for the exceptions. Because the staff has not been able to verify the adequacy of the justification through its review of the information provided to date, this issue is a high priority licensing concern that needs to be addressed by Constellation.*
- *The staff will discuss this issue further at the public meeting with Constellation scheduled for December 15, 2022, to identify an appropriate regulatory path forward. Possible paths include the staff issuing a request for additional information as part of its detailed review of the LAR, or Constellation providing supplemental information or an additional licensing action requesting an exemption or alternative request."*

Vendor Oversight

- Constellation's Vendor Oversight Plan (VOP) was executed during review.
- The plan requires the execution of Constellation's Owner's Acceptance Review of External Technical Products Procedure.
- Constellation provided comments to ensure Emergency Operating Procedures (EOPs) and Severe Accident Guidelines (SAGs) overrides are described appropriately in the Licensing Technical Report (LTR).
- The typo identified for IEEE 603 Clause 5.6.1 was not identified by reviewers.
- The following actions were taken per the VOP to ensure high quality:
  - An entry into Constellation's Supplier Fundamental Management System (SFMS)
  - An entry into the VOP Action Tracking Item Assignment System (ATI 04456784) to formally track completion and results of the vendor's Corrective Action Program Issue Report (CAP-2022-10020).
  - Review results of the issue report
  - Ensure LTR is revised

IEEE 603 Clauses 6.6 & 7.4

- Constellation provided comments to ensure EOPs and SAGs overrides are described appropriately in the LTR during the review process.
- Subsequent to the first Acceptance Review Meeting, the Constellation team reached out to industry experts to aid in the understanding of the Operating Bypass definition in the context of EOPs and SAGs.
- Discussions with IEEE standards working group members identified that Operating Bypasses, by definition, permit plant mode changes in IEEE 603-1991 & IEEE-279.
- Further review of the application of EOPs and SAGs in the PPS revealed that these features do not permit plant mode changes.
- The logic developed to support the EOPs and SAGs are overrides to ensure the appropriate safety function can be executed.
- Conclusion: LTR miscategorized “overrides” as “operating bypasses.” This will be corrected in next LTR revision.

What is an Operating Bypass?

- According to IEEE Std 603-1991, an operating bypass is used to permit plant mode changes:

> **operating bypass.** Inhibition of the capability to accomplish a safety function that could otherwise occur in response to a particular set of generating conditions.
>
> NOTE: An operating bypass is not the same as a maintenance bypass. Different modes of plant operation may necessitate an automatic or manual bypass of a safety function. Operating bypasses are used to permit mode changes (for example, prevention of initiation of emergency core cooling during the cold shutdown mode).

- With this definition for "operating bypass," all PPS operating bypasses meet the criteria in both IEEE Std 279 and 603, "the bypass will be removed automatically whenever permissive conditions are not met." [IEEE Std 279].
- Overrides in the Limerick EOPs and SAGs are not "operating bypasses" per the definition in IEEE Std 603-1991 and therefore this criteria in IEEE Std 279 and 603 does not apply.
- With this decision of full compliance, there will be no action to request alternate compliance via 10CFR50.55(a)(z), as discussed during previous Acceptance Review Meeting held on November 10, 2022.

Changes to the Licensing Technical Report (LTR)

- Accordingly, the LTR (WCAP-18598) will be revised.
- Compliance to IEEE Std 603 Table (Section 7) for Clause 5.6.1 will be changed from “PC” to “C.”
- The Compliance/Conformance indication in the IEEE Std 603 Compliance Table (Section 7) for Clauses 6.6 and 7.4 will change from “E” to “C.”
- Section 3.3.2.8 will be revised as shown on the next slide.
- It is expected that additional changes will also be incorporated into LTR during the final design process and during the RAI process, with goal of updating these and the above in Spring 2023.
- The revised LTR will be submitted on the docket when completed.

Changes to the Licensing Technical Report (LTR)

3.3.2.8 IEEE Std 603-1991 Clauses 6.6 and 7.4

IEEE Std 603-1991 Clause 6.6, Operating Bypasses states: *Whenever the applicable permissive conditions are not met, a safety system shall automatically prevent the activation of an operating bypass or initiate the appropriate safety function(s). If plant conditions change so that an activated operating bypass is no longer permissible, the safety system shall automatically accomplish one of the following actions:*

(1) Remove the appropriate active operating bypass(es).
(2) Restore plant conditions so that permissive conditions once again exist.
(3) *Initiate the appropriate safety function(s).*

The PPS provides permissives for manual operating bypasses when plant conditions are appropriate and will remove these permissives when the plant conditions are no longer appropriate.[213] ~~The PPS also initiates automatic bypasses consistent with the current design basis (see Section 3.2.24.1.5). The emergency operating procedures (EOPs) or Severe Accident Guidelines (SAG) call for bypassing or defeating of interlocks to allow operation of specific equipment under administrative control, for example, by passing or defeating the low RPV water level (Level 1) automatic isolation of the MSIVs to allow the MSIVs to be manually open to establish the use of the main condenser as a heat sink if specific conditions are met. PPS provides the capability at the SDs to bypass or defeat specific interlocks under administrative control. The use of these logic bypasses or overrides does not conflict with the design and licensing basis, but does not meet the criteria of this clause. UFSAR Section 15.0.6 provides the licensing basis vs. the Emergency Procedure Guidelines.~~

Constellation.

Changes to the Licensing Technical Report (LTR)

Table 7-1 Compliance/Conformance Matrix for IEEE Std 603 and IEEE Std 7-4.3.2

IEEE Std 603 Clause	IEEE Std 7-4.3.2 Clause	Title	Compliance/ Conformance	Section(s)
5.6.1		Between Redundant Portions of a Safety System	~~PC~~ C	3.5.14.1

6.6	6*	Operating Bypasses	~~E~~ C	3.3.2.8
7.4	7*	Operating Bypass	~~E~~ C	3.3.2.8

Close Out Remarks

- Questions?
- Next Steps?
- Final Remarks
  - CEG
  - NRC