

From: [Marshall, Michael](#)
To: [Catron, Steve](#)
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Subject: FYI: Discuss of Availability of Human Factor Validation Information to Support the Planned Turkey Point Digital I&C License Amendment Request (L-2021-LRM-0007)
Date: Thursday, December 23, 2021 8:56:00 AM

Hello Steve,

The NRC staff would like to meet with NextEra/FPL to discuss the availability of human factor validation information in support of the planned Turkey Point digital instrumentation and controls (I&C) license amendment request (LAR). After comparing the proposed review timeline developed by the NRC staff for the planned Turkey Point digital I&C LAR to the licensee's planned Human Factors Engineering (HFE) phase activities (last discussed at the August 23/25, 2021, public meeting between the NRC and NextEra/FPL), it has come to the attention of NRC staff that there may be challenges to completing the review (i.e., within the original NRC estimate of 15 months) of the planned LAR in time to support the 2023 Unit 4 refueling outage.

Based on our prior discussions, this LAR is expected to be submitted for review under the Alternative Review Process (ARP), discussed in the NRC digital Instrumentation and controls interim staff guidance (DI&C-ISG-06). As discussed in Section B.1.4 of DI&C-ISG-06, HFE is a review area outside the scope of the ARP interim staff guidance. For digital I&C equipment modifications that involve HFE considerations, an NRC safety evaluation is expected to be performed in accordance with the NRC Standard Review Plan (NUREG-0800, SRP), Chapter 18, "Human Factors Engineering"; NUREG-0711, "Human Factors Engineering Program Review Model"; and NUREG-1764, "Guidance for the Review of Changes to Human Actions."

Issue:

In accordance with the guidance in NUREG-0711, NRC staff typically assess validation and verification (V&V) information, including information regarding integrated system validation (ISV) testing, as part of our review. However, based on our comparison of the NRC-developed proposed review timeline and HFE phase activities described by NextEra/FPL, it is unclear whether ISV testing is expected to be completed prior to the time period wherein the NRC will need to complete all necessary review activities (incl., completion and documentation of the staff's safety evaluation) in a timely manner to support the licensee's planned implantation of the proposed amendment (i.e., installation of the control room medications) during the Unit 4 2023 refueling outage.

As discussed in NUREG-0711, NRC staff typically review the content of an applicant's submittal and supplemental reports, such as results summary reports (RSRs) documenting the completion of actions discussed in implementation plans (IPs). Section 11.3 of NUREG-0711 states that, at a minimum, the RSR should include (among other information) the following:

- a description of the methodology, if an NRC approved IP was not used
- a description of the results from Task Support Verification and HFE Design Verification
- details of the results of the ISV, including a statement of how the validation demonstrates the ability to safely operate the plant
- a list of HEDs generated from the V&V, the analyses associated with these HEDs, and their resolutions

Section 11.3 further clarifies that summaries may be used for any of the above items, provided that references are given for more detailed documents. Documents containing the additional details supporting the RSRs would be expected to be made available for NRC review during the audit phase of the NRC's review. Section 11.4 of NUREG-0711 discusses the criteria that the NRC will use when reviewing a licensee's submittal. Section 11.4.3 discusses the criteria specific to ISV testing. These criteria include, in part, the following:

- The applicant should use a combination of quantitative and qualitative methods to analyze data. The analysis should reveal the relationship between the observed performance and the established performance criteria.
- The applicant should identify human engineering discrepancies (HEDs) when the observed performance does not meet the performance criteria.
 - Furthermore, the applicant should resolve HEDs identified by pass/fail measures before the design is accepted.
- The applicant should document the statistical and logical bases for determining that performance of the integrated system is, and will be acceptable.
- The applicant should document the limitations in the validation tests, their possible effects on the conclusions of the validation, and their impact on implementing the design.

Possible Resolution:

Please prepare to discuss possible resolutions to this issue, including the following at the upcoming public pre-submittal meeting:

- Any available updates regarding the planned timeline for HFE planning, design, and V&V activities.
- If ISV testing activities are not expected to be complete prior to the date that completion of the LAR review is needed to support implementation of the proposed modifications, please discuss what alternative information will be provided for NRC staff review to support the development of the NRC's safety evaluation.

- For example, is FPL considering alternative testing approaches, such as multi-stage validation (MSV) as a means to provide reasonable assurance that the integrated system will continue to adequately support safe plant operation?

Note that discussion of MSV can be found in Nuclear Energy Agency (NEA) Report No. 7466, "Multi-Stage Validation of Nuclear Power Plant Control Room Designs and Modifications", issued by the Organisation for Economic Co-Operation and Development (OECD). The NRC has not officially endorsed this guidance/approach, but it (or another alternative proposed within the LAR submittal) could be considered by the NRC technical review staff as a possible alternative to the guidance/approach discussed in NUREG-0711 for this specific request.

- Are there any other alternative approaches to resolving this timing issue that FPL is considering at this time?

The document that describes the multi-stage validation approach that we want to discuss with NextEra/FPL is available from this Nuclear Energy Agency site:

https://www.oecd-nea.org/jcms/pl_15142/multi-stage-validation-of-control-room-designs-and-modifications

Best Regards,

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