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General Comment

The attached PDF file contains industry comments.

Attachments

03-11-16_NRC_Industry Comments on Proposed Revision to NUREG-0800, Section 18.0 [Docket ID NRC-2015-0187]

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March 11, 2016

Ms. Cindy K. Bladey
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Washington, DC 20555-0001

Subject: Industry Comments on Proposed Revision to NUREG-0800, Section 18.0, *Human Factors Engineering* [Docket ID NRC-2015-0187]

Project Number: 689

Dear Ms. Bladey:

On behalf of the nuclear energy industry, the Nuclear Energy Institute (NEI)¹ is providing comments on draft Revision 3 to NUREG-0800 Standard Review Plan (SRP) Section 18.0 *Human Factors Engineering*, [Docket ID NRC-2015-0187]. As discussed during Nuclear Regulatory Commission (NRC) public meetings on January 7, 2016 and February 8, 2016, we have significant concerns that the staff's proposed shift in Human Factors Engineering (HFE) review scope is incompatible with the actual HFE design process, would have a significant adverse impact on applicants, and lacks a regulatory basis.

The draft revision 3 of SRP Section 18.0 states that the staff will review "the applicant's HFE control room design described in the design certification (DC) application," whereas the current SRP review scope is on the HFE programs and processes. Specifically, for design certifications, the proposed guidance states that "review of results summary reports (RSRs) is preferred except for elements NUREG-0711 specifies as only needing an Implementation Plan (HFE program plan, Human Performance Monitoring)." In contrast, existing guidance in Revision 2 of SRP 18.0, Revision 3 of NUREG-0711, *Human Factors Engineering Program Review Model*, and Revision 06/2007 of Regulatory Guide 1.206, *Combined License Applications for Nuclear Power Plants (LWR Edition)*, provide a standard approach for the NRC staff to make safety findings for

¹ NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

applications that do not include RSRs. This current practice has yielded the requisite HFE safety findings for five design certifications without NRC staff review of results summary reports, and ensures that the combined license (COL) holder implements an approved HFE program to arrive at the final validated control room design prior to initial fuel load. As a point of reference, the AP1000 was first certified in 2004, amended in 2011, and currently has four units under construction in the U.S. Completion of the HFE RSRs and closure of the associated design acceptance criteria (DAC) for AP1000 is still in progress, with the first several HFE DAC expected to be completed in 2016.

The NRC's proposal that additional control room and HFE design information be included in applications appears to be inconsistent with the NRC policy for small modular reactors (SMRs),² which allows a reduced level of detail and review for non-safety related and non-risk significant SSCs.³ Future applications are expected to reflect designs that require significantly less operator action to safely operate the plant and respond to transients. For example, operator actions for many designs will not be relied upon during any design basis event, will not be significant to the probabilistic risk assessment (PRA) for beyond-design basis event scenarios, and will be expected to be performed hours after event initiation, not as part of the immediate event response. In light of the reduced role of operators, and thus of human factors, in the safe operation of these new designs, it is unclear why the NRC is dramatically *increasing* the information expected for HFE at the DC application stage.

The NRC has not provided a basis for breaking so dramatically from the current practice. We are not aware of any safety issues with existing design certifications, or deficiencies in the associated NRC safety findings that were based upon review of implementation plans and the use of DAC in lieu of RSRs. NRC staff stated during January 6 and February 8 public meetings that additional design information is needed in future applications as a result of lessons-learned from the AP1000 construction projects, specifically that control room and HFE design finalization is presenting schedule challenges for plants currently under construction. A decision to finalize HFE design during construction should be a business decision that is appropriately addressed by designers and COL holders and not an issue the NRC should regulate as it does not impact the public health and safety.

We believe the staff has not adequately considered the impact that the NRC proposed changes would have on applicants. Finalizing the design in order to complete RSRs not only requires substantially more HFE design detail, it also requires substantially more design detail for instrumentation and control (I&C) and most other plant systems. Many of the system designs that would need to be finalized are part of the balance of plant, and some systems are outside the scope of design certification. In addition, the designer would be required to develop operating guidelines, training, and a control room simulator to support the

² See Staff Requirements – COMGBJ-10-0004/COMGEA-10-0001 – "Use of Risk Insights to Enhance Safety Focus of Small Modular Reactor Reviews," August 31, 2010 (ADAMS Accession No. ML102510405).

³ See NUREG-0800, Introduction – Part 2: "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants."

verification and validation element, none of which is currently required for a DC application. This would necessitate a level of design detail that is not available for the DC application and is inconsistent with the NRC's conclusions in SECY-90-377 regarding both the necessary level of detail for the staff to reach safety conclusions for Design Certification, and in some cases the "technically achievable" level of design detail by a DC applicant.⁴ The level of effort required to produce a nearly final plant design for a DC application is impractical and cost prohibitive. We estimate that the changes proposed by the staff would add about a half a billion dollars and four years to the preparation of a design certification application.

Although we understand applicants are always permitted to deviate from the SRP, it is inefficient to develop guidance based on a staff preference for design information that has been demonstrated to be unnecessary to reach a safety finding and is impractical for an applicant to provide. We expect that future applicants will continue to submit implementation plans for most HFE elements, as that is the extent of HFE development that can be practically achieved to support an application. We also expect that future applicants will use DAC for the completion of the associated RSRs when implementation plans and the use of inspections, tests, analyses and acceptance criteria (ITAAC) are not sufficient for the NRC to make a safety finding. The use of DAC in the area of HFE was justified by the NRC staff in SECY 92-053, approved by the Commission, and included in the five NRC approved DCs; there is no need for each applicant to individually justify the use of DAC for HFE.

We understand that applicants, such as NuScale Power, LLC (NuScale), that propose an alternative to the control room staffing requirements of 10 CFR 50.54(m) and desire the alternative to be included in the certification rule must provide adequate technical basis for NRC consideration. However, even in this situation, the discussions during the February 8 NRC public meeting with NuScale made clear that providing completed RSRs as called for in the draft SRP is neither practical nor necessary to support the required HFE safety findings for design certification. In any event, the expectation that substantially more HFE design information be provided in design certification applications should not be broadly applied via this SRP to all future applicants.

Recommendations:

- 1) The NRC should not revise SRP 18.0 to incorporate the staff's proposed new approach to HFE reviews. During the January 7 and February 8 public meeting, the NRC staff indicated an interest in developing an alternative approach based on a phased review. We are prepared to work with the NRC to develop a phased review approach that aligns with the design, review and inspection processes, and minimizes the reliance on DAC in a cost effective manner.

⁴ NRC SECY 90-377, "Requirements for Design Certification Under Part 52." See, e.g., page B-1-21, which documents NRC's preliminary determination that aspects of the final I&C design—including instrument location drawings, instrument list, final instrument setpoint list, and "panel arrangement/layout drawings"—as not technically achievable by the DC Applicant.

Ms. Cindy K. Bladey


March 11, 2016

Page 4

- 2) The NRC should consider updating NUREG-0711 in lieu of or in conjunction with the update to SRP 18.0, as the draft revision of SRP 18.0 includes numerous proposed changes that are intended to provide guidance to applicants. NUREG-0711 is applicant guidance and is a more appropriate place for this new information. However, we note that some of the NRC staff proposals appear to lack a regulatory basis and raise substantial concerns, such as the need to address "other accidents of high or moderate frequency which may not be analyzed in the SAR."
- 3) The NRC staff should consider providing applicant specific guidance for near term applicants with design features that are not adequately addressed by existing NRC guidance. For example, SRP 18.0 Attachment B, *Methodology to Assess the Workload of Challenging Operational Conditions in Support of Minimum Staffing Level Reviews*, provides NRC guidance for applicants that propose staffing levels that do not meet requirements of 10 CFR 50.54(m). For these applicants, it would be more appropriate for the NRC to issue design specific standard review plans or other application specific guidance, until such time as the guidance is incorporated into NUREG-0711.
- 4) The NRC should coordinate with the IEEE SC-5 working group on developing IEEE P2411 *Human Factors Engineering Guide for the Validation of System Designs and Integrated Systems Operations at Nuclear Facilities*.

If you have any questions or require additional information, please contact Marc Nichol at (202) 739-8131; mrn@nei.org or me.

Sincerely,



Russell J. Bell

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