



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

November 13, 2014

Mr. Mark A. Satorius  
Executive Director for Operations  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**SUBJECT: STANDARD REVIEW PLAN CHAPTER 19 AND SECTION 17.4**

Dear Mr. Satorius:

During the 616<sup>th</sup> meeting of the Advisory Committee on Reactor Safeguards, July 9-11, 2014, we reviewed Chapter 19 and Section 17.4 of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition." Our July 16, 2014, letter report describes the recommendations from our review.

In their August 28, 2014 response, the staff disagreed with our Recommendation 1, agreed in essence with our Recommendation 2, and disagreed with our Recommendation 3. We will discuss briefly the rationale for our Recommendation 3 and then turn to the primary reason for this letter, our Recommendation 1.

### **Recommendation 3**

Recommendation 3 urges the staff to consider revising the guidance to endorse PRA conformance with ASME/ANS Capability Category II to the greatest extent achievable in the design certification and combined license stages of the licensing review. In their response to our letter, the staff concluded that Capability Category I PRAs are sufficient for meeting the Commission's objectives, without explanation of the basis for that assertion. We have found no Commission guidance that Capability Category I provides sufficient quality for design certification PRAs. Acceptance of Capability Category I was established initially by Interim Staff Guidance.

We disagree that Capability Category I is sufficient. For example, we have observed that design certification applicants are using their PRAs to inform the selection of design options that reduce risk. Our own spot checks of design certification PRAs have found areas where potentially significant components and failure modes have been omitted from PRAs that meet Capability Category I. This experience demonstrates that it is time to shift the endorsement to Capability Category II, which will give more confidence in the technical quality and results of the design certification PRAs. We acknowledge that there will be some site-specific and, perhaps,

design-specific areas where full achievement of Capability Category II will not be possible at the design certification stage. Those instances should be justified and identified for enhancement as the applicable design information and operating experience become available.

Use of Capability Category II at the design certification stage will also reduce the burden on combined license holders to find such omissions and correct them when their plant-specific PRAs are developed prior to fuel load.

### **Recommendation 1**

Recommendation 1 asks the staff to develop consistent guidance that does not distinguish between plant designs that employ passive or active safety features. This would simplify and clarify the guidance by combining Sections 17.4 and 19.3 of the Standard Review Plan, with a single set of criteria that assure adequate availability and reliability for risk-significant non-safety-related structures, systems, and components (SSCs) that are not covered by plant Technical Specifications.

The term Regulatory Treatment of Non-Safety Systems (RTNSS) was coined during early reviews of new plant designs to address staff concerns about availability and reliability controls for SSCs that are important to safety, but are not designated as safety-related for the purposes of design-basis licensing analyses. The staff argues that continued separation of the RTNSS designation is needed to address unique considerations for plants with passive safety systems. In their response, the staff identified three conditions that determine the need for special RTNSS controls:

- (1) There is greater uncertainty in passive safety system reliability. We agree and are concerned about the extent to which this aspect of the passive systems has not been modeled in the current design certification PRAs, as documented in our reports on recent design certifications. Proposed RTNSS programs have given little weight to this consideration.
- (2) There is dependence on some non-safety-related SSCs for assuring that safety functions necessary to bring the plant to a safe cold shutdown condition are maintained in the period beyond 72 hours after an accident. We recognize that for many accidents, the passive safety systems cannot bring the plant to cold shutdown. However, they can meet the requirement of General Design Criterion 34 to transfer residual heat from the reactor core at a rate such that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded. The need to maintain stable core decay heat removal after 72 hours has been a basis for including SSCs in the current RTNSS programs. The same considerations would apply to non-safety-related SSCs that are needed to assure long-term cooling for any plant design.
- (3) There is potential for unique system interactions between passive systems and active systems that are operating simultaneously. The RTNSS programs we have examined do not appear to address this condition. The PRA can and certainly should address this issue, as should the Chapter 15 safety analyses.

In summary, the RTNSS programs, as currently applied, do not fully address the special considerations for passive plant designs that are cited by the staff. These special considerations are important, and they should be addressed within the design-specific PRAs. This would allow the risk results to aid in the selection of SSCs for inclusion in the Reliability Assurance Program (RAP) and would ensure that treatment is consistent with an integrated assessment of risk significance. In cases where the PRA is judged to inadequately address the special considerations, appropriate measures could be taken to add associated SSCs to the RAP. A more balanced treatment of enhanced reliability and availability controls for risk-significant non-safety-related SSCs can be achieved through a single RAP, without the need for distinctions between "passive" and "active" plant designs.

Sincerely,

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John W. Stetkar  
Chairman

## REFERENCES

1. Memorandum to J. Stetkar, "Standard Review Plan Chapter 19 and Section 17.4", M. Satorius, August 28, 2014 (ML14204A004)
2. Letter to M. Satorius, "Standard Review Plan Chapter 19 and Section 17.4", ACRS Letter Report, July 16, 2014 (ML14196A119)
3. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 17.4, "Reliability Assurance Program," Revision 1, May 2014 (ML13296A435)
4. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 19.0, "Probabilistic Risk Assessment and Severe Accident Evaluation for New Reactors," Draft Revision 3, September 2012 (ML12132A481)
5. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 19.1, "Determining the Technical Adequacy of Probabilistic Risk Assessment for Risk-Informed License Amendment Requests after Initial Fuel Load," Revision 3, September 2012 (ML12193A107)
6. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 19.2, "Review of Risk Information used to Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance," Revision 0, June 2007 (ML071700658)

7. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 19.3, "Regulatory Treatment of Non-Safety Systems for Passive Advanced Light Water Reactors," Draft Revision 0, June 2013 (ML13081A756)
8. DC-COL-ISG-003, "Interim Staff Guidance: Probabilistic Risk Assessment Information to Support Design Certification and Combined License Applications," August 11, 2008 (ML081430675)

- 7. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 19.3, "Regulatory Treatment of Non-Safety Systems for Passive Advanced Light Water Reactors," Draft Revision 0, June 2013 (ML13081A756)
- 8. DC-COL-ISG-003, "Interim Staff Guidance: Probabilistic Risk Assessment Information to Support Design Certification and Combined License Applications," August 11, 2008 (ML081430675)

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