



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 7, 2016

Mr. Bryan C. Hanson
President and Chief Nuclear Officer
Exelon Nuclear
R. E. Ginna Nuclear Power Plant
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: R.E. GINNA NUCLEAR POWER PLANT - REQUEST FOR ADDITIONAL
INFORMATION REGARDING: RISK-INFORMED TECHNICAL
SPECIFICATIONS INITIATIVE 5B (CAC NO. MF6358)

Dear Mr. Hanson:

On June 4, 2015, Exelon Generation Company, LLC, submitted an application for a proposed amendment for R. E. Ginna Nuclear Power Plant, which would modify the technical specifications by relocating specific surveillance frequencies to a licensee-controlled program with the implementation of Nuclear Energy Institute 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies."

The Nuclear Regulatory Commission staff is reviewing the submittal and has determined that additional information is needed to complete its review. The specific questions are found in the enclosed request for additional information (RAI). On December 4, 2015, the Exelon staff indicated that a response to the RAI would be provided by February 5, 2016.

Please contact me at (301) 415-3629 if you have any questions on this issue.

Sincerely,

A handwritten signature in black ink, appearing to read "Diane Render".

Diane Render, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-244

Enclosure:
As stated

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION

REGARDING ADOPTION OF TSTF-425

EXELON GENERATION COMPANY, LLC

R. E. GINNA NUCLEAR POWER PLANT

DOCKET NO. 50-244

In a letter dated June 4, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15166A075), Exelon Generation Company, LLC, (Exelon, the licensee), submitted an application for a proposed amendment to the Technical Specifications (TSs) (or license or licensing basis) for R. E. Ginna Nuclear Power Plant (Ginna), which would modify TSs by relocating specific surveillance frequencies to a licensee-controlled program with the implementation of Nuclear Energy Institute 04-10, "Risk-Informed Technical Specifications Initiative 5b [RITS-5b], Risk-Informed Method for Control of Surveillance Frequencies." The Nuclear Regulatory Commission (NRC) staff is reviewing the submittal and has the following questions:

Division of Risk Assessment/PRA Licensing Branch

1. In Attachment 2 of the license amendment request (LAR), assessment of the technical adequacy of the Ginna Internal Events Probabilistic Risk Assessment (PRA) is based primarily on the 2009 peer review. As required by Regulatory Guide (RG) 1.200, Revision 2, document all the individual findings and selected suggestions, i.e., those suggestions for which the reference supporting requirements (SR) changed between the 2007 version of the American Society of Mechanical Engineers/ American Nuclear Society (ASME/ANS) PRA Standard, as clarified by Revision 1 to RG 1.200, and the 2009 version of the Standard, as clarified and qualified by Revision 2 of RG 1.200, resulting from the 2009 internal events peer review, and their disposition, whether or not they have been closed (unless closed via a subsequent peer review, full or focused-scope). Include discussion as to whether the disposition applies to changes in risk as well as the base-line risk, since the peer review is against the latter, but the application involves the former as well.
2. The LAR indicates that a Fire PRA, associated with transition to NFPA-805, was performed and Peer Reviewed in August 2012. However, the facts and observations (F&Os) identified from the NFPA-805 Fire Peer Review were not provided for consideration in the LAR associated with RITS-5b changes to TS Surveillance Frequencies. The LAR states:

The 2012 fire PRA peer review for the PRA ASME model update identified 183 Supporting Requirements (SR) to be reviewed for the Ginna PRA. Of these 2 were not met, 2 met capability category (CC) 1, 8 partially met CC 2, 17 met CC 2, 13 partially met CC 3, 7 met CC 3, and 118 fully met all capability requirements and 16 were not applicable. There were 19 findings and 22 suggestions issued to address

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potential gaps to compliance with the PRA standard. There were 3 Best Practices. All of the findings from the fire PRA peer review have since been closed. As the results of this peer review have already been communicated to the NRC as part of the NFPA-805 submittal and subsequent requests for additional information (RAI), these will not be catalogued in this document.

Previous responses described above and in the NFPA-805, submittals are associated with assessing the PRA technical adequacy to address fire-related hazards. To the extent that there were deficiencies in the Fire PRA models associated with systems, structures, and components for which changes to TS Surveillance Frequencies are being sought, there is no equivalent clarification of how the Fire PRA related F&Os will not have an impact on the Technical Specifications Task Force (TSTF)-425, Revision 3. It is the NRC's position that Fire PRA related F&Os must be considered when evaluating TS Surveillance Frequency changes. Therefore provide the following:

- a. An assessment of how the 2012 Fire Peer Review F&Os have been resolved to assure PRA Technical Adequacy with respect to TSTF-425, not NFPA-805. Include discussion as to whether the disposition applies to changes in risk as well as the base-line risk, since the peer review is against the latter, but the application involves the former as well.
- b. For those Fire PRA related F&Os, which are dispositioned as not having an impact on TSTF-425, Revision 3, provide the technical basis for this determination.
- c. Discussion of how the licensee plans to incorporate updates to fire PRA state-of-the-art enacted since the 2012 peer review, including but not limited to updated fire ignition frequencies and non-suppression probabilities (as per NUREG-2169, "Nuclear Power Plant Fire Ignition Frequency and Non-Suppression Probability Estimation Using the Updated Fire Events Database") and updated spurious operation occurrence probabilities and probabilities for duration exceedance (as per NUREG/CR-7150, Volume 2, "Joint Assessment of Cable Damage and Quantification of Effects from Fire").
- d. Consistent with the requirements in Table A-4 of RG 1.200, Revision 2, clarify how the Fire PRA addresses the following requirements with regard to differential risk evaluations related to TSTF-425, Revision 3:
 - i. In SR FSS-A4, RG 1.200, Revision 2 changes "one of more" to "sufficient."
 - ii. In Fire PRA F&O FSS-F1-01, RG 1.200, Revision 2 changes SR FSS-F1 from "one or more fire scenarios that could" to "a sufficient number of fire scenarios to characterize."
 - iii. In Fire PRA F&O FSS-G5-01: Is potential failure of the wall water spray system to provide structural integrity of the boundary addressed? This includes the probability that the system does not perform its function such

that the boundary could be breached and result in a multi-compartment fire scenario (e.g., the assumption of perfect reliability versus high reliability, is non-conservative).

- iv. In Fire PRA F&O SF-A1-02, provide a disposition that addresses the item of concern, namely failure of the analysis to fully assess the potential impact of a seismically induced failure (rupture or spurious operation of fire protection features on the post-earthquake response).
 - v. The disposition of SR FSS-G5 partly justifies reclassifying the F&O as CC II based on the disposition cited for F&O FSS-G5-01 discussed previously. The concern discussed previously needs to be resolved in order for the CC II assignment to be fully justified.
3. Revision 2 of RG 1.200 adds clarification to IE-C12 regarding resolution of F&O IE-C10-01 [SR IE-C12 in the current version of the ASME/ANS Risk Standard], including its accompanying Note. Since this peer review finding was against RG 1.200, Revision 1, explain whether there is any change to the disposition or impact on TSTF-425 as a result of the Revision 2 update. If none, justify why not.
 4. The current PRA model was assessed to only be CC I, whereas expectations are that all SR be met at the CC II level (or justification be provided for the adequacy of Capability Category I for the specific application) regarding resolution of SC-A12-01 [Also SR SC-A-2 in the current version of the ASME/ANS Risk Standard], which remains unresolved. The LAR takes the position that the SR is conservative and that differential risk evaluations for the TS Surveillance Frequency changes will thus also be conservative. Verify by example, or analysis, that this presumed conservatism is such that it ensures the differential risk for the application is also conservative, (i.e., the risk estimated for the before versus after condition is not overestimated such that subtracting it from the after value could underestimate the risk increase).
 5. Resolution of SY-A18-01 [SR SY-A19 in the current version of the ASME/ANS Risk Standard] involves use of a systematic approach to consider maintenance unavailability, some of which may be overlapping, or not precluded by operating procedure limitations, which remains unresolved. The standard requires:

In the systems model, INCLUDE out-of-service unavailability for components in the system model, unless screened, in a manner consistent with the actual practices and history of the plant for removing equipment from service...

The LAR states that the possibility of partially overlapping component unavailability has not yet been resolved, but is in all cases conservative because component unavailability combinations that would normally not be possible are being added into the core damage frequency (CDF) and large early release frequency (LERF) differential quantifications. The disposition does not determine the extent of such overlapping unavailability, but rather *a-priori* assumes that, if there are, modeling would be less conservative than currently failing to model. Given that risk changes, before versus after, are the subject of concern, such conservatism, if applied to the before risk, could actually generate

non-conservative risk increases when a larger risk is subtracted from the after risk than a more accurate smaller risk. Provide:

- a. A further discussion of plant practices and the modeling of these practices relevant to overlapping simultaneous Test and Maintenance unavailability.
 - b. A verification by example, or analysis, that this presumed conservatism is such that it ensures the differential risk for the application is also conservative (i.e., the risk estimated for the before versus after condition is not overestimated, such that subtracting it from the after value could underestimate the risk increase).
6. The standard requires that a PRA model regarding resolution of F&O IE-C13-01 [SR IE-C15 in the current version of the ASME/ANS Risk Standard] does the following: "CHARACTERIZE the uncertainty in the initiating event frequencies and PROVIDE mean values for use in the quantification of the PRA results." The sources of uncertainty which are 'considered' versus 'not considered' in estimation of mean values of any cutset element form an important input in judging the technical adequacy of a PRA model. The original peer review noted that "Section 5 [of the Initiating Event Notebook] does not provide or reference the parametric uncertainty initiating event data distribution [with a specific example cited]." The LAR treatment of this F&O expresses an opinion that while this 'documentation only' is still unresolved, this issue would not impact TSTF-425 PRA evaluations. The sources of uncertainty that were actually considered are an integral part when assessing PRA technical adequacy. Therefore:
- a. Characterize what types of uncertainties are actually considered in the estimation of each initiating event mean frequency in the current PRA model of record.
 - b. Clarify if this currently unresolved F&O IE-C13-01 was subsequently re-evaluated in the 2012 Fire PRA Peer Review as a "back-referenced" SR item.
7. Resolution of F&O HR-G3-01 was based upon conformance with RG 1.200, Revision 1. The assessment of PRA Technical Adequacy must address conformance with RG 1.200, Revision 2. Revision 2 of RG 1.200 has added a number of specific clarifications to the ASME/ANS Risk Standard regarding SR HR-G3, which are noted below:
- Cat I:
- (a) the complexity of detection, diagnosis, decision-making and executing the required response.
- Cat II, and III:
- (d) degree of clarity of the cues/indications in supporting the detection, diagnosis, and decision-making give the plant-specific and scenario-specific context of the event.
 - (g) complexity of detection, diagnosis and decision-making, and executing the required response.

Provide a gap assessment of the current Human Reliability Analysis in the PRA model of

record against the additional clarifications in RG 1.200, Revision 2 noted above.

8. Resolution of F&O IF-C8-01 [IFSN-A16 in the current version of the ASME/ANS Risk Standard] involves a flooding source that was screened based on qualitative consideration of potential human action; but for that action (in response to a 2,000 gallons per minute fire service water break in IBN), there doesn't appear to be any justification for the time identified (190 min). Nothing other than time available is cited as rationale for screening the event. The LAR states that the "impact is expected to be minimal, and is not expected to have any impact on the Surveillance Frequency Control Program." Without having corrected the PRA model of record to address the specific internal flood source issue it is not readily obvious how the conclusion of minimal impact was obtained. Therefore, provide the technical bases for assuring this omitted flood source in fact does not have any impact on the TSTF-425 based Surveillance Frequency Control Program.
9. Revision 2 of RG 1.177 provides guidance for changing TS Surveillance Frequencies. However, for allowable risk changes associated with Surveillance Frequency extensions, it refers to RG 1.174, Revision 2, which provides quantitative risk acceptance guidelines for changes to CDF and LERF. Revision 2 of RG 1.174 invokes RG 1.200, Revision 2 to address PRA Technical Adequacy. Revision 2 of RG 1.200 endorses, with clarifications, portions of the ASME/ANS RA-Sa-2009 standard. The RITS-5b LAR is based upon TSTF-425, Revision 3 and a PRA Model, which was assessed in a Peer Review for conformance with RG 1.200, Revision 1. Conformance with the requirements of RG 1.200, Revision 2 is a requirement. Therefore:
 - a. Provide a gap analysis to Identify any areas where the current PRA model of record does not conform to the PRA Technical Adequacy requirements of RG 1.200, Revision 2, and the ASME/ANS RA-Sa-2009 standard.
 - b. Clarify how the PRA applications associated with RITS-5b will not be impacted by the gaps in the PRA model conformance with RG 1.200, Revision 2.
 - c. Clarify that there have been no PRA model upgrades as defined in Appendix 1-A of ASME/ANS RA-Sa-2009, which would require a focused Peer Review. Specifically, discuss whether the addition of two diesel generators as an alternate source of power to the standby auxiliary feedwater pumps and a condensate storage tank as a dedicated water source for these pumps in model GN114A-W constitutes an upgrade. If so, has there been a focused-scope peer review? If not, justify.
 - d. Confirm that the total baseline risk is consistent with the quantitative risk acceptance guidelines of RG 1.174, Revision 2, which provides for changes to CDF and LERF.
10. Revision 2 of RG 1.200 defines a significant model change as follows: "Whether a change is considered significant is dependent on the context in which the insights are used. A change in the risk insights is considered significant when it has the potential to change a decision being made using the PRA." F&Os IF-D5a-01 (unresolved),

IF-D7-01, [IFEV-A6, IEFV-A8 in the current version of the ASME/ANS Risk Standard], in the current PRA model of record, involve:

- a. Not adequately addressing plant-specific characteristics that might affect the manner in which the frequencies of flooding are estimated (e.g., material condition, aging degradation, and water-hammer potential).
- b. Inappropriate screening (out) of certain internal flood scenarios without applying consistent screening criteria, as required in SRs IF-D7 and IF-E3a.

If the frequencies of specific internal floods are improperly evaluated, the importance of specific flood scenarios and how they impact the unavailability of specific components will be inappropriate, and this will impact the technical adequacy of the PRA model of record. The RITS-5b LAR indicates that a sensitivity evaluation for a particular surveillance test interval evaluation will be performed to determine if there is any impact. Within the scope of TSTF-425, Revision 3, clarify:

- a. The specific sensitivity studies which are to be performed with the PRA model of record in order to demonstrate technical adequacy of the internal flooding frequencies without correcting the identified deficiency noted in the peer review F&O IF-D5a-01.
 - b. The impact on the unavailability of specific components evaluated in the Surveillance Frequency Control Program of "screening in" internal flood sources which were eliminated in the current PRA model of record.
11. Similar to F&O IE-C13-01 dealing with internal events, Internal Flooding F&O IF-F3-01 [IFQU-B3 in the current version of the ASME/ANS Risk Standard], and which is still unresolved, identified deficiencies in the consideration of uncertainties and that the treatment "did not constitute an adequate characterization of the sources of uncertainty associated with the flood analysis or a comprehensive discussion of the assumptions that could have an effect on the results." The LAR treats this F&O as a "documentation only F&O" which will not impact evaluation of specific components in the Surveillance Frequency Control Program. Without knowing what sources of uncertainty were actually considered, and how such uncertainties propagate to the end results, it was not possible for the original peer review to assess the required technical adequacy. Therefore:
- a. Characterize what types of uncertainties are actually considered in the estimation of each initiating event mean frequency in the current PRA model of record.
 - b. Clarify if this currently unresolved F&O IF-F3-01 was subsequently re-evaluated in the 2012 Fire PRA Peer Review as a "back-referenced" SR item.
12. F&O IF-E5-01 [IFQU-A5 in the current version of the ASME/ANS Risk Standard], involved use of HRA methods, which were not consistent with the methods used elsewhere in the PRA model. The LAR indicates the issue has been resolved. The ASME/ANS Risk Assessment Standard, Non-Mandatory Appendix 1-A, would require a focused peer review if there was an underlying PRA model upgrade (e.g., application of new methods

which were different than those in the original model) but not for PRA model maintenance, where PRA model maintenance is specifically defined: "plant modifications, procedure changes, plant performance (data)." Confirm that the revised HRA performed for the internal flooding portion of the PRA model of record uses HRA methods that are consistent with other portions of the PRA that have been peer reviewed. If not, confirm whether a "focused Peer Review had been performed" for the internal flooding HRA consistent with the requirements of ASME/ANS RA-Sa-2009, Appendix 1-A.

13. The LAR states in Section 2.0.5 of Attachment 2:

The results of the standby failure rate sensitivity study plus the results of any additional sensitivity studies identified during the performance of the reviews as outlined in 2.2.1 and 2.2.3 above for each STI change assessment will be documented and included in the results of the risk analysis that goes to the IDP.

The LAR does not contain any Section 2.2.1 or 2.2.3. Correct the LAR to address the missing Sections 2.2.1 and 2.2.3.

14. The LAR states in Section 2.0.4 of Attachment 2 with regard to the most recent PRA model GN114A-W and peer reviews conducted for the internal events model in 2009 and fire PRA model in 2012:

All remaining gaps will be reviewed for consideration during the 2015 model update but are judged to have low impact on the PRA model or its ability to support a full range of PRA applications. The remaining gaps are documented in the URE database so that they can be tracked and their potential impacts accounted for in applications where appropriate.

Confirm that any gap assessment and, if identified as required due to model upgrades, focused-scope or full-scope peer review will be performed in accordance with the then latest version of the ASME/ANS PRA Standard as endorsed, clarified and qualified by the then latest revision (currently Revision 2) of RG 1.200.

15. F&O LE-C2a-01 addressed the need for realistic treatment of feasible operation actions after core damage, noting it is conservative not to credit these. The cited impact to TSTF-425 stated that there are limited operator actions that could influence LERF, such that their effect is unlikely to be significant, possibly even lowering LERF estimates. Therefore, the omission of these actions is conservative and does not adversely impact the PRA model used for TSTF-425 analysis.

Conservatism in the before versus after risk when performing a risk increase calculation does not guarantee a conservative estimate of the risk increase, since a more realistic estimate of the before risk, being lower, would lead to a more conservative estimate of the risk increase when before is subtracted from after. Either demonstrate essentially no effect on the before risk by excluding credit for these actions or reassess the before risk, and therefore the risk increase, after incorporating credit for these actions.

16. F&O LE-C9a-01 addressed survivability credit for equipment or human actions that could

be impacted by containment failure, stating that it did not appear such credit was taken, leaving this SR as CC I, acknowledged as not applicable in the disposition and impact on TSTF-425.

If crediting equipment survivability in the before versus after risk condition would lead to a more conservative estimate of the risk increase, then it may not only be non-conservative to have ignored this, but also may fail to meet even CC-I for the application where it is the risk increase that is the key, not the base risk. Further, N/A may not be an appropriate disposition. Address this F&O in light of the potential effect on risk increase, not only base risk, with regard to TSTF-425.

17. F&O LE-C10-01 addressed realistic containment bypass analysis, including justification for any scrubbing credit, stating that no such credit was taken, although there was a sensitivity analysis determining any impact would be negligible. As a result, no impact on TSTF-425 was cited.

Verify that the impact of not considering scrubbing is negligible with respect to the risk increase from the before vs. after risk calculation, not just negligible with respect to the base risk.

Division of Safety Systems/Technical Specification Branch

18. As required by section 50.36 of Title 10 of the *Code of Federal Regulations* (10 CFR 50.36), "Technical Specifications," the licensee must provide a summary statement of the bases or reasons for such specifications as part of the LAR submittal. Although the NRC staff does not approve TS bases changes, this information is utilized by the staff during the review of the LAR. The following issues associated with the TS bases were identified during the LAR review:
 - a. The licensee provided proposed revisions to the TS bases pages in Attachment 4 of the initial submittal on June 4, 2015. During the NRC staff's review, it was noted that several references cited throughout the bases pages were being deleted due to revisions associated with the adoption of TSTF-425, but it appeared that the deleted references were also cited in other parts of the TS bases; therefore, the deletions would be incorrect. The pages with deleted references that are in question from Attachment 4 include: B 3.3.1-47, B 3.4.12-13, B 3.4.13-6, and B 3.4.14-7. Please verify the deletion of these references is accurate.
 - b. On TS bases page B 3.1.6-6 of the initial licensee submittal, the description for SR 3.1.6.3 states, "A reduction of the Frequency to every 4 hours...." Since the LAR is proposing to transfer the periodic frequency for this SR to the Surveillance Frequency Control Program (SFCP), please explain why there is a "4 hour" reference in the bases description for this SR.
 - c. On TS bases page B 3.4.2-3 of the initial licensee submittal, there are references to the "30 minute" SR frequency for SR 3.4.2.2. Since the LAR is proposing to

transfer the periodic frequency for this SR to the SFCP, please explain why there are "30 minute" references in the bases description for this SR.

- d. In the LAR supplement submitted by the licensee on October 2, 2015, TS bases information associated with the adoption of TSTF-425 was provided in Attachment-5. On page 4 of this attachment, the new proposed description for SR 3.5.2.8 was provided. The first paragraph of this description is not written in a coherent manner. Please correct the language.

January 7, 2016

Mr. Bryan C. Hanson
President and Chief Nuclear Officer
Exelon Nuclear
R. E. Ginna Nuclear Power Plant
4300 Winfield Road
Warrenville, IL 60555

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Please contact me at (301) 415-3629 if you have any questions on this issue.

Sincerely,
/RA/
Diane Render, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-244

Enclosure:
As stated

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