REQUEST FOR ADDITIONAL INFORMATION (RAIs)

LICENSE AMENDMENT REQUEST TO REVISE TECHNICAL SPECIFICATIONS

TO ADOPT TSTF-505, REVISION 2,

"PROVIDE RISK INFORMED EXTENDED COMPLETION TIMES – RITSTF INITIATIVE 4B"

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

Division of Risk Assessment (DRA)
Probabilistic Risk Assessment (PRA) Licensing Branch A (APLA) Questions

APLA RAI 01 – Open Internal Events PRA Facts and Observations (F&O)

Regulatory Guide (RG) 1.200, Revision 2[1] provides guidance for addressing PRA acceptability. RG 1.200, Revision 2, describes a peer review process using the American Society of Mechanical Engineers/American Nuclear Society (ASME/ANS) PRA Standard ASME/ANS-RA-Sa-2009[2], as one acceptable approach for determining the technical acceptability of the PRA. The primary results of a peer review are the F&Os recorded by the peer review team and the subsequent resolution of these F&Os. A process to close finding-level F&Os is documented in Appendix X to the Nuclear Energy Institute (NEI) guidance documents NEI 05-04, NEI 07-12, and NEI 12-13[3], which was accepted by the NRC in a letter dated May 3, 2017.[4]

Section 1-2.2 of the 2009 ASME/ANS PRA Standard defines a PRA upgrade as the incorporation into a PRA model significant changes in scope or capability that impact the significant accident sequences or the significant accident progression sequences, and Examples 20 and 21 of the Non-mandatory Appendix states that changes to the human reliability analysis (HRA) approach that significantly impacted risk insights would constitute a PRA upgrade.

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[1] Regulatory Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment for Risk-Informed Activities," Revision 2, dated March 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML090410014).

[2] American Society of Mechnical Engineers (ASME) and American Nuclear Society (ANS) PRA standard ASME/ANS RA-Sa-2009, "Addenda to ASME/ANS RA-S-2008, Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications," dated February 2009, New York, NY (Copyright).

[3] Anderson, V. K., Nuclear Energy Institute, letter to Stacey Rosenberg, U.S. Nuclear Regulatory Commission, "Final Revision of Appendix X to NEI 05-04/07-12/12-16, Close-Out of Facts and - Observations (F&Os)," dated February 21, 2017 (ADAMS Accession No. ML17086A431).

[4] Giitter, J., and Ross-Lee, M.J., U.S. Nuclear Regulatory Commission, letter to Krueger, G., Nuclear Energy Institute, "U.S. Nuclear Regulatory Commission Acceptance on Nuclear Energy Institute Appendix X to Guidance 05-04, 07-12, and 12-13, Close-Out of Facts and Observations (F&Os)", May 3, 2017 (ADAMS Accession No. ML17079A427).

The LAR states that a full-scope peer review of the internal events PRA was performed in 2009 and an F&O closure review was performed in 2017. Further, as stated in the safety evaluation for NFPA-805 (ML16126A033), the 2009 peer review was performed using PRA standard ASME RA-Sb-2005 as clarified by RG 1.200 Rev. 1. Table E2-1, "Waterford 3 [Waterford Steam Electric Station, Unit 3] PRA Peer Reviews," of license amendment request (LAR[5]) Enclosure 2 presents the dispositions for two F&Os related to Human Reliability Analysis (HRA) that remain open after the 2017 F&O closure review (F&Os HR-F2-01 and HR-G4-01), which were assessed by the F&O closure review team as partially resolved. The two open F&Os appear to capture concerns regarding lack of cue analysis and inaccurate or unjustified time windows for Human Failure Events (HFEs). Based on the F&O dispositions in the LAR, it appears that the HRA Calculator was subsequently implemented in 2019 after the completion of the F&O closure. In the original 2009 peer review, the team stated that the licensee's analysis was "unjustified" and "inaccurate" in some places while the IA team concluded that the licensee's spreadsheets "lacked thorough detail and references." Further, during the audit, the NRC staff identified a lack of justification for the HRA time window estimates including no plant specific thermal hydraulic assessments and/or other relevant calculations to support and justify the analysis.

In its 10 CFR 50.69 APLA RAI 01 response,[6] the licensee provided comparison of the top ten human failure events (HFEs) between the 2013 Revision 5 of the PRA model of record (MOR), and the 2019 Revision 6 of the PRA MOR corresponding to the PRA model revisions prior and after the transition to the HRA Calculator. The RAI response stated that other changes were made to the HRA, such as timings, dependency credit, procedural guidance, in addition to the transition to the HRA calculator. The staff noted that some of the HFEs demonstrated large changes in value. Multiple changes appear to have occurred between the peer review of the original HRA spreadsheet in 2009 and the development of the HRA Calculator in Revision 6 of the MOR in 2019. The differences between the original spreadsheet and the HRA calculator are unclear but appear to be significant. Therefore, the NRC staff cannot establish confidence in the HRA analysis used to support the RICT program.

a) Provide further justification that the transition to the HRA Calculator does not constitute a PRA Upgrade per the ASME/ANS PRA Standard, as clarified by the latest revision of RG 1.200.

b) Given that the most recent peer review of the HRA for the Waterford internal events PRA was performed in 2009, against RG 1.200 Rev 1 and ASME ANS 2005, the HRA differences shown in the response to 50.69 RAI between 2013 R5 of the PRA model of record, and the 2019 R6 of the PRA model of record appear significant, provide further justification that all the cumulative changes in the HRA since 2009 do not warrant a focused-scope peer review on the HRA in the Waterford internal events PRA.

c) Alternatively, to Part (b), propose a mechanism to ensure a focused-scope peer review of the HRA is performed and all associated finding-level F&Os are closed prior to implementation of the RICT program.

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[5] Letter from Gaston, R.., Entergy Operations, Inc., to NRC Document Control Desk, "Application for Technical Specification Change to Adopt Risk-Informed Extended Completion Times - RITSTF Initiative 4b," February 8, 2021 (ADAMS Accession No. ML21039A648).
[6] Gaston, R., Entergy letter to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information Regarding License Amendment Request to Adopt of 10 CFR 50.69", dated October 1, 2021 (ADAMS Accession No. ML21274A876).

APLA RAI 02 – Crediting of FLEX in the PRA Model

The NRC memorandum dated May 30, 2017[7], provides the NRC's staff assessment of identified challenges and strategies for incorporating Diverse and Flexible Mitigation Capability (FLEX) equipment into a PRA model in support of risk-informed decision-making in accordance with the guidance of RG 1.200.

Regarding equipment failure probability in the May 30, 2017, memorandum, the NRC staff concludes (Conclusion 8):

> The uncertainty associated with failure rates of portable equipment should be considered in the PRA models consistent with the ASME/ANS PRA Standard as endorsed by RG 1.200. Risk-informed applications should address whether and how these uncertainties are evaluated.

Regarding HRA, Nuclear Energy Institute (NEI) report NEI 16-06, "Crediting Mitigating Strategies in Risk-Informed Decision Making," Section 7.5, "Human Reliability Assessment," recognizes that the current HRA methods do not translate directly to human actions required for implementing mitigating strategies. Sections 7.5.4, "Addressing the Actions Not Currently Addressed by Existing HRA Tools," and 7.5.5, "Addressing Complex Actions in Mitigating Strategies," of NEI 16-06 describe such actions to which the current HRA methods cannot be directly applied, such as: debris removal, transportation of portable equipment, installation of equipment at a staging location, routing of cables and hoses; and those complex actions that require many steps over an extended period, multiple personnel and locations, evolving command and control, and extended time delays. In the May 30, 2017, memorandum, the NRC staff concluded, in part (Conclusion 11):

> Until gaps in the human reliability analysis methodologies are addressed by improved industry guidance, HEPs [Human Error Probabilities] associated with actions for which the existing approaches are not explicitly applicable, such as actions described in Sections 7.5.4 and 7.5.5 of NEI 16-06, along with assumptions and assessments, should be submitted to NRC for review.

In its 10 CFR 50.69 APLA RAI 04 response, the licensee performed a FLEX sensitivity study (no FLEX credit) that demonstrated a 5.5 and 2 percent impact on CDF and LERF respectively. In addition, the response identified three items related to FLEX modeling in the PRA that are proposed to be addressed in a future PRA model update: modeling of FLEX operator actions for pre-initiators, modeling declaration of Extended Loss of AC Power (ELAP) and incorporation of FLEX operator actions into the HRA dependency analysis. It appears these items would be included in the next scheduled PRA model update, which may occur after implementation of the RICT program. It is unclear to the NRC staff the impact of the FLEX uncertainty and the FLEX modeling exclusions on the RICT calculations (the impact may be more significant for certain TS LCOs than for others).

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[7] Reisi-Fard, U.S. NRC Memorandum to Giitter, J.G., U.S. NRC, "Assessment of the Nuclear Energy Institute 16 06, 'Crediting Mitigating Strategies in Risk-Informed Decision Making,' Guidance for Risk Informed Changes to Plants Licensing Basis," dated May 30, 2017 (ADAMS Accession No. ML17031A269).

a) Provide justification, such as sensitivity studies, that the uncertainties related to FLEX credit in the PRA do not significantly impact any TS LCO RICT calculation.

b) Provide justification, such as sensitivity studies, that the exclusion of the three FLEX HRA items not yet modeled in the Waterford PRA do not significantly impact any TS LCO RICT calculation.

c) Provide justification that the uncertainties associated with both Part (a) and Part (b) combined do not impact any TS LCO RICT calculation or alternatively, discuss how these uncertainties will be addressed for the RICT program.

APLA RAI 03 – Real-Time Risk (RTR) Model and Update Process

Regulatory Position 2.3.3 of RG 1.174, Revision 3[8], states that the level of detail in the PRA should be sufficient to model the impact of the proposed licensing basis change. The characterization of the problem should include establishing a cause-effect relationship to identify portions of the PRA affected by the issue being evaluated. Full-scale applications of the PRA should reflect this cause-effect relationship in a quantification of the impact of the proposed licensing basis change on the PRA elements. Therefore, address the following:

a) Section 4.2 of NEI 06-09, Revision 0-A[9], describes attributes of the configuration risk management tool (CRM). A few of these attributes are listed below:

- Initiating events accurately model external conditions and effects of out-of-service equipment.
- Model translation from the PRA to a separate CRM tool is appropriate; CRM fault trees are traceable to the PRA. Appropriate benchmarking of the CRM tool against the PRA model shall be performed to demonstrate consistency.
- Each CRM application tool is verified to adequately reflect the as-built, as-operated plant, including risk contributors which vary by time of year or time in fuel cycle or otherwise demonstrated to be conservative or bounding.
- Application specific risk important uncertainties contained in the CRM model (that are identified via PRA model to CRM took benchmarking) are identified and evaluated prior to use of the CRM tool for RMTS applications.
- CRM application tools and software are accepted and maintained by and appropriate quality program.
- The CRM tool shall be maintained and updated in accordance with approved station procedures to ensure it accurately reflects the as-built, as-operated plant.

[8] Regulatory Guide 1.174, Revision 3 , "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis", January 2018 (ADAMS Accession No. ML 17317A256).
[9] Topical Report NEI 06-09, "Risk Informed Technical Specifications Initiative 4b: Risk Managed Technical Specification (RMTS)," Revision 0-A, October 2012 (ADAMS Accession No. ML122860402).

As discussed in Enclosure 8 of the LAR, the process and procedures that ensure the fidelity of the RTR to the PRAs including documentation of changes and testing are in development and the merging of all PRA hazards into a single top model is not completed. With regards to development and application of the RTR model, provide the following:

i. Describe the remaining steps required to complete the RTR Model and completion of the CRMP tool.

ii. Describe the process that will be used to create the single-top RTR Model from the three individual PRA models.

iii. Provide details of the benchmarking activities (verification and validation (V&V)) to be performed to confirm consistency of the RTR model results to the PRA Models of Record (MORs) results.

iv. Provide details of the V&V activities to verify the CRMP Tool RICT calculations.

b) Section 2.3.4, "PRA Technical Adequacy," of TR NEI 06-09, Revision 0-A states, in part, that "criteria shall exist in PRA configuration risk management to require PRA model updates concurrent with implementation of facility changes that significantly impact RICT calculations."

As discussed in LAR Enclosure 9, the Waterford PRA model update process relies on model change requests (MCRs). However, it was unclear to the NRC staff whether the MCR criteria is adequate to reasonably ensure there is no significant impact on the RICT calculations without a model update.

i. Describe the Waterford process and criteria to identify when an RTR model update is required for the RICT program.

ii. Justify how the Part (i) process and criteria are adequate in ensuring no significant impact to any RICT calculation occurs before a RTR model update.

APLA RAI 04 – System and Surrogate Modeling Used in the PRA Models

The NRC staff's safety evaluation (SE) to TR NEI 06-09[10] specifies that the LAR should provide a comparison of the technical specification (TS) functions to the PRA modeled functions and that justification be provided to show that the scope of the PRA model is consistent with the licensing basis assumptions. Table E1-1 in Enclosure 1 of the LAR identifies each TS limiting condition for operation (LCO) proposed to be included in the RICT program and describes how the systems and components covered in the TS LCO are implicitly or explicitly modeled in the PRA. For certain TS LCO conditions, the table explains that the associated structures, systems, and components (SSCs) are not modeled in the PRAs but will be conservatively represented using a surrogate event. For some LCOs, the LAR did not provide enough description of the surrogate PRA modeling that will be used in the RICT calculations for NRC staff to understand whether the modeling will be acceptable. Therefore, address the following:

[10] Final Safety Evaluation For Nuclear Energy Institute (NEI) Topical Report (TR) NEI 06 09, "Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines", May 17, 2007 (ADAMS Accession No. ML071200238).

a) LAR Table E1-1, states that for TS LCO 3.6.3 (Containment Isolation Valves) that not all containment isolation valves/lines are modeled in detail in the PRA, and therefore, bounding surrogates ‘can’ be used to ensure the affected components are included in the CDF and large early release frequency (LERF) calculations. The meaning of the phrase "‘bounding can be used” is not clear to the NRC staff. It is not clear to NRC staff (1) how the use of the surrogate modeling bounds the function of SSCs that are taken out of service during a RICT for this TC LCO Condition and (2) will surrogates be used in all case. Therefore:

   i. Explain what component failures will be used as a surrogate to model TS LCO 3.6.3, given that not all containment isolation valves are modeled in detail in the PRA.

   ii. Describe what surrogates will be used in the model and explain the basis for the surrogate that will be used. Include an explanation of how this relates to the design basis success criterion for the containment isolation function.

b) LAR Table E1-1, states for TS LCO 3.3.2 (The Engineered Safety Features Actuation System (ESFAS) Instrumentation) Condition 2 (Containment Spray Actuation Signal (CSAS)) that the Containment High Pressure instrumentation/function will not have a RICT and Condition 7(e) (Emergency Feedwater Actuation (EFAS)) that the control valve logic is not modeled, and that other steam generator logic and other instruments will be used as a surrogate for this LCO. It is not clear how surrogates for these TS LCO Conditions will be used. Therefore:

   i. Provide additional rationale for the differentiation between the proposed RICT for LCO 3.3.2(2) and the statement “containment high pressure and pressurizer pressure low instrumentation/function will not have an RICT” and how this will be captured in the TS.

   ii. Provide details on how the surrogate will be used to model TS LCO Condition 3.3.2.7e. Include in the discussion how the surrogate is equivalent or bounding of the LCO function.

c) Regarding TS LCO 3.4.3.1, “Pressurizer,” the LAR states that the pressurizer heaters are included in the PRA model with the “fail to de-energize function,” which contributes to high pressurizer pressure. The LAR recognizes that the PRA model does not capture the TS function, which requires the heaters to energize when needed. To capture the risk due to entering this LCO, the LAR proposes to use a surrogate event of a stuck open atmospheric dump valve. It is unclear to the NRC staff how a stuck open atmospheric dump valve would lead to similar accident scenarios as an inoperable pressurizer heater.

   Provide further justification why the proposed surrogate for LCO 3.4.3.1 is a conservative and bounding PRA treatment for the loss of the pressurizer heaters.

d) Regarding LCO 3.7.6.1, “Control Room Emergency Air Filtration System,” and LCO 3.7.6.3, Control Room Air Conditioning System, LAR Table E1-1 states: “[a]ll the components in the MCR [main control room] HVAC [heating, ventilation, and air conditioning]/filtration system are not in the PRA model, but several AHUs [air handling units], fans and dampers are included allowing for a bounding evaluation using the CRMP."

Regarding unmodeled SSCs, the NRC staff's SE for TR NEI 06-09 states, in part, the following:

> TR NEI 06-09, Revision 0, specifically applies the RMTS only to those SSCs which mitigate core damage or large early releases. Where the SSC is not modeled in the PRA, and its impact cannot otherwise be quantified using conservative or bounding approaches, the RMTS are not applicable, and the existing frontstop CT [completion time] would apply.

Further, Item 11 in Section 2.3, Scope," of TSTF-505, Revision 2, states:

The traveler will not modify Required Actions for systems that do not affect core damage frequency (CDF) or large early release frequency (LERF) or for which a RICT cannot be quantitatively determined.

Provide further justification on the proposed PRA modeling to capture the impact on CDF and LERF from entering LCO 3.7.6.1 and LCO 3.7.6.3, since it is only partially modeled in the PRA.

<u>APLA RAI 05 – Instrumentation and Controls</u>

Section 2.3.4 of TR NEI 06-09, Revision 0-A, states that PRA modeling uncertainties be considered in application of the PRA base model results to the RICT program. The NRC SE for TR NEI 06-09, Revision 0, states that this consideration is consistent with Section 2.3.5 of RG 1.177, Revision 1[11].The guidance in TR NEI 06-09, Revision 0-A, further states that sensitivity studies should be performed on the base model prior to initial implementation of the RICT program on uncertainties, which could potentially impact the results of a RICT calculation, and that sensitivity studies should be used to develop appropriate compensatory risk management actions (RMAs).

Regarding digital I&C, known modeling challenges exist such as the lack of industry data for digital I&C components, the difference between digital and analog system failure modes, and the complexities associated with modeling software failures including common cause software failures. Also, though reliability data from vendor tests may be available, this source of data is not a substitute for in-the-field operational data. Given these challenges, the uncertainty associated with modeling a digital I&C system could impact the RICT program. It Is not clear to the NRC staff if there are digital system that are credited in the PRA models that will be used in the RICT program. In light of these observations:

a) Explain whether digital I&C systems are credited in the PRA models that will be used in the RICT program.

b) If digital I&C systems are credited in the PRA models that will be used in the RICT program, then:

[11] RG 1.177, Revision 1, "An Approach for Plant-Specific, Risk-Informed Decision-making: Technical Specifications" (ADAMS Accession No. ML100910008).

i. Identify those systems and provide the results of a sensitivity study on the SSCs in the RICT program demonstrating that the uncertainty associated with modeling digital I&C systems has an inconsequential impact on the RICT calculations.

ii. Alternatively, identify which LCOs are determined to be impacted by the digital I&C system modeling for which RMAs will be applied during an RICT. Explain and justify the criteria used to determine what level of impact to the RICT calculation require additional RMAs.

APLA RAI 06 – Potential Loss of Function Conditions

The model SE for TSTF-505 Revision 2 limited applicability of the TSTF to conditions that were not considered TS loss of function (LOF).

Regarding LCO 3.7.1.5, One Main Steam Isolation Valve (MSIV) inoperable, LAR Table E1-1 states that the design success criteria require 2 out of 2 main steam isolation valves (MSIVs). Based on this information and Revision 2 to TSTF-505, it appears that LCO 3.7.1.5 could constitute an LOF, and therefore would be not covered by TSTF-505 Revision 2.

During the audit the licensee stated other components, other than the MSIVs, are credited in meeting the design criteria. It is unclear to the NRC staff the design criteria of this TS LCO, the substitution of other components, and applicability of this LCO to the RICT program. In light of these observations:

a) Describe the design function(s), such as steam flow isolation from the secondary side of the steam generators, related to LCO 3.7.1.5.

b) Describe how many MSIVs are required to perform each of the design function(s) described in Part (a).

c) Describe any additional functions/components that are within scope of the TS. Provide justification that these components are credited in the design function(s) provided in Part (a).

d) Provide justification that the inoperability of one MSIV does not constitute a loss of function. Include in this response why inclusion of this LCO into the RICT program is consistent with TSTF-505 Revision 2.

APLA RAI 07 – Risk Management Actions (RMAs)

The NRC SE for NEI 06-09, Revision 0-A, states that the LAR will describe the process to identify and provide compensatory measures and RMAs during extended CTs.

In Enclosure 3 of the LAR, the licensee stated that it would determine RMAs based on plant procedures. It is not clear to the NRC staff whether the RTR tool risk information would be incorporated into the RMA selection process given that the licensee's program is apparently still in development with final inputs still pending. Regarding the possible non-use of the CRMP tool, the NRC staff notes that certain plant configurations can have more than one TS LCO entry (including RICT and non-RICT combinations). It is unclear to the staff how appropriate RMAs can be identified to reflect the as-operated plant risk profile without the CRMP tool risk results and insights.

a) Describe the limitations of the proposed CRMP tool with respect in assessing risk insights in determining the RMA(s) to be implemented for the real-time as-built, as-operated plant configuration.

b) With regards to Part (a), clarify if the licensee intends to use the CRMP tool in determining RMAs. Include in this response, if its use is intended, the details of how the CRMP tool will be incorporated into the RMA decision process.

c) With regards to Part (b), provide details of any other intended inputs to the licensee's RICT RMA program.

d) If the CRMP tool is not included in the RMA process, then describe the criteria and insights that will be used in determining RMAs for multiple TS LCO entry, including RICT and non-RICT plant configurations, without the input of the CRMP tool risk results. Include in this discussion how this approach addresses the real-time as-built, as-operated plant risk profile.

e) Explain how RMAs are identified for emergent conditions in which the extent of condition evaluation for inoperable SSCs is not complete prior to exceeding the Completion Time to account for the increased possibility of a common cause failure (CCF). Include in this discussion how these RMAs are adequate without the input of the CRMP tool risk profile.

APLA RAI 08 – Determinations of Key Assumptions and Sources of Uncertainty

Section 2.3.4 of NEI 06-09 states that PRA modeling uncertainties be considered in application of the PRA base model results to the RICT program. The NRC SE for NEI 06-09 states that this consideration is consistent with Section 2.3.5 of RG 1.177, Revision 1. NEI 06-09 further states that sensitivity studies should be performed on the base model prior to initial implementation of the RICT program on uncertainties, which could potentially impact the results of a RICT calculation and that sensitivity studies should be used to develop appropriate compensatory RMAs.

The NRC staff noted that many identified sources of uncertainty for this application were apparently dispositioned on engineering judgement and not on RICT calculation sensitivities. The staff notes that the responses to Waterford's 10 CFR 50.69 RAIs 02 (process to identify key assumptions and sources of uncertainty for the specific application), RAI 03 (new disposition regarding fire ignition frequencies), and RAI 04 (designating FLEX credit in PRA as a key source of uncertainty) demonstrated that, in some cases, the qualitative disposition was not adequate for the application when compared to a quantitative determination. Therefore, it is unclear to the NRC staff the adequacy of qualitative judgements in identifying key assumptions and sources of uncertainty for the RICT program. In light of these observations:

a) Regarding the 10 CFR 50.69 APLA RAI 03.a response for fire ignition frequencies, provide justification, such as sensitivity studies, that the fire ignition uncertainty does not significantly impact any TS LCO RICT calculation.

b) Regarding the 10 CFR 50.69 APLA RAI 02 response for identifying key sources of uncertainty provide justification, such as sensitivity studies, that the sources of uncertainty that can impact CDF and LERF values and dispositioned by engineering judgement do not significantly impact any TS LCO RICT calculation.

c) Consistent with the 10 CFR 50.69 APLA RAI 02, confirm that the review of plant specific PRA assumptions and sources of uncertainties was documented for impact and use in the RICT program.

APLA RAI 09 – RICT Estimates

During the audit it was indicated that some of the RICT estimates provided in LAR Table E1-2 may not be correct. Confirm the RICT estimates in the LAR are correct or provided updated estimates as necessary.

DRA PRA Licensing Branch C (APLC) Questions

APLC Question 01 – High Confidence of Low Probability of Failure

As clarified in the SE on NEI 06-09, Revision 0-A, other sources of risk (i.e., seismic and other external events) must be quantitatively assessed if they contribute significantly to configuration-specific risk. The SE on NEI 06-09, Revision 0-A also states that bounding analyses or other conservative quantitative evaluations are permitted where realistic PRA models are unavailable.

LAR Enclosure 4, Table E4-1, "External Hazard Evaluation," presents the licensee's bounding analysis of seismic risk to Waterford 3. The LAR states that a convolution was performed with a high confidence of low probability of failure (HCLPF) value of 0.25g. Engineering Report PSA-WF3-04-01, "Seismic Risk Evaluation to Support the TSTF-505 LAR," Revision 1 notes that this value was provided in an EPRI letter dated March 11, 2014 (ML14083A586). The engineering report uses the HCLPF value of 0.25g to calculate a median capacity of 0.67g.

The NRC staff notes that the EPRI letter provides a median capacity, rather than an HCLPF, of 0.25g for Waterford 3. The NRC staff also notes that Safety/Risk Assessment for Generic Issue 199 (ML100270582), "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants," Appendix C, Table C-2, "Plant-Level Fragility Data," contains an HCLPF value of 0.1g for Waterford 3, which is consistent with the EPRI's median capacity of 0.25g.

As part of the RAI response to APLC Question 03.a for the licensee's LAR to adopt 50.69 (MLML21274A876), the licensee provides an explanation for the reasonableness of the chosen HCLPF value of 0.25g. The staff reviewed the RAI response and determined it does not provide sufficient justification for a site-specific HCLPF value of 0.25g.

The licensee discusses seismic walkdowns, which did not identify any seismic vulnerabilities or concerns, but does not determine a site-specific HCLPF value. The licensee discusses the site-specific safe shutdown earthquake (SSE) and ground motion response spectra (GMRS) and then scales the peak ground acceleration (PGA) HCLPF value to 0.144g (approximately 0.15g) based on the seismic demand. The staff determined this is an acceptable approach as it is based on the site-specific seismic information.

Please address the following:

a) Use the site-specific HCLPF value of 0.144g (rounded to 0.15g) to evaluate the seismic risk and provide updated values for the seismic core damage frequency (SCDF) and seismic large early release frequency (SLERF).

b) As an alternative to part a., provide justification for a new site-specific HCLPF value and evaluate the seismic risk using this new site-specific HCLPF value.

<u>APLC Question 02 – Calculation of Seismic LERF</u>

As clarified in the SE on NEI 06-09, Revision 0-A, other sources of risk (i.e., seismic and other external events) must be quantitatively assessed if they contribute significantly to configuration-specific risk. The SE on NEI 06-09, Revision 0-A also states that bounding analyses or other conservative quantitative evaluations are permitted where realistic PRA models are unavailable.

LAR Enclosure 4, Table E4-1 presents the licensee's bounding analysis of seismic risk to Waterford 3. The LAR describes an adjustment to the conditional large early release probability (CLERP) for internally initiated events to calculate SLERF from SCDF. The LAR states that the selected factor of 0.1 is conservative relative to the calculated site risk from other hazards.

As part of the RAI response to APLC Question 03.b for the licensee's LAR to adopt 50.69 (MLML21274A876), the licensee modified the SCLERP value from 0.1 to 0.15. The staff reviewed the RAI response and determined it does not provide sufficient justification for a site-specific SCLERP value of 0.15 since:

1. The seismic fragilities for the containment and containment bypass are not site-specific and no justification is provided for their applicability to the plant, and

2. The justification uses the internal events PRA model to develop CLERPs, which may not be applicable to seismic events.

The NRC staff notes that implementation of an emergency plan could be delayed or impeded by a seismic event, which can result in internal events non-LERF accident sequences becoming a LERF accident sequence for a seismic initiating event. In addition, SCLERP values vary from site to site from a few percent to more than 50%.

Please address the following:

a) Provide justification for site-specific seismic fragilities for containment and containment bypass and evaluate a site-specific SLERF using these fragilities.

b) As an alternative to part a., provide a revised SLERF evaluation that is based on plant-specific information.

<u>APLC Question 03 – External Hazards Screening</u>

NEI 06-09, Revision 0-A, Section 2.3.1, Item 7 states that the impact of other external events risk shall be addressed in the RMTS program. NEI 06-09 further states that this may be accomplished via one of three methods. The first method allows the licensee to provide a reasonable technical argument (to be documented prior to implementation of the RMTS program) that the external events that are not modeled in the PRA are not significant contributors to configuration risk. The SE on NEI 06-09, Revision 0-A also states that other external events are treated quantitatively unless it is demonstrated that these risk sources are insignificant contributors to configuration-specific risk.

LAR Enclosure 4, Section 1 provides a list of the external hazards considered in this application. This list was obtained from NUREG-1855, "Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decision Making," Volume 1, dated March 2009.

NUREG-1855 was subsequently revised in March 2017. The current revision provides a list of hazards in Table 4-1. This comprehensive list is essentially the same list of hazards in nonmandatory Appendix 6-A of ASME/ANS Standard RA-Sa-2009. Therefore, the external hazards considered in this application is only a fraction of the hazards in the PRA standard or NUREG-1855, Revision 1.

Please evaluate the impacts from the external hazards that are listed in the PRA standard or NUREG-1855, Revision 1 but are not considered in LAR Enclosure 4. If there are no impacts from these external hazards, document which external hazards were evaluated and screened out.

Division of Engineering and External Hazards (DEX) Electrical Engineering Branch (EEEB) Questions

Title 10 of the Code of Federal Regulations, Part 50 (10 CFR 50), Section 36, "Technical specifications," requires, in part, that the applicants for a license authorizing operation of a production or utilization facility must include in their application proposed TSs. 10 CFR 50.36(c) requires that TSs include items in five specific categories related to station operation. These categories are (1) Safety limits, limiting safety system settings, and limiting control settings, (2) Limiting conditions for operation (LCOs), (3) Surveillance requirements (SRs), (4) Design features, and (5) Administrative controls. The proposed change to the Waterford 3 TSs relates to the LCO category.

10 CFR 50, Appendix A, General Design Criterion (GDC) 17, "Electric power systems," states, in part:

> "An onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety."
>
> "The onsite electric power supplies, including the batteries, and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure."
>
> "Provisions shall be included to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of

power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electric power supplies."

TS LCO 3.8.2.1 requires, in part, the following D.C. electrical sources shall be OPERABLE:

a. 125-volt Battery Bank No. 3A-S and one associated full capacity charger (3A 1-S or 3A2-S).
b. 125-volt Battery Bank No. 3B-S and one associated full capacity charger (3B1-S or 3B2-S).
c. 125-volt battery Bank No. 3AB-S and one associated full capacity charger (3AB1-S or 3AB2-S).

TS 3.8.2.1, Action a. requires that "With one of the required battery banks inoperable, restore the inoperable battery bank to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours."

EEEB Question 01 – Table Revision

Please revise LAR Enclosure 1, "List of Revised Required Actions to Corresponding PRA Functions," Table E1-1 for TS 3.8.2.1 to list TS Conditions a. and b. (and if necessary, Condition c. separately in first column "Proposed TS LCO Condition."

EEEB Question 02 – Table Revision

The licensee proposed to revise TS 3.8.2.1, ACTION a., by increasing the completion time from 2 hours to 2 days for inoperable battery bank to be OPERABLE. In LAR Enclosure 1, Table E1-1 for TS 3.8.2.1, Condition a., the Design Success Criteria (DSC) requires "one battery or one charger supplying DC power to 125 DC bus." The DSC is for the minimum power sources that must be available to address licensed design basis accident (DBA), which in this case is only one of the two redundant 125-batteries (i.e., either battery 3A-S or 3B-S). Based on safety related loads per UFSAR Tables 8.3-3 and 8.3-4 battery 3AB-S is not completely redundant with batteries 3A-S or 3B-S, and thus, does not appear consistent with the DSC. However, the UFSAR refers to battery 3AB-S being available during a DBA in Sections 8.3.2.1.1 and 8.3.2.1.7 and Table 8.3-5.

Please revise Table E1-1, TS 3.8.2.1, as follows, or provide justification why these revisions are not necessary:

1. Revise Conditions a. and b to clearly indicate the referenced batteries (e.g., "one battery or one charger supplying DC power to one of two redundant 125V DC buses (3A-DC-S or 3B-DC-S)")

2. Confirm if battery 3AB-S is required to be OPERABLE to respond to a DBA, add Condition c., as appropriate, to the LAR.

EEEB Question 03 - TS 3.8.3.1 Revision

TS LCO 3.8.3.1 requires, in part, the following ESF buses shall be energized:

a. Train A A.C. ESF busses consisting of:
1. 4160-volt ESF Bus #3A3-S
2. 480-volt ESF Bus #3A31-S

b. Train B A.C. ESF busses consisting of:
1. 4160-volt ESF Bus #3B3-S
2. 480-volt ESF Bus #3B31-S

c. Train AB A.C. ESF busses consisting of:
1. 4160-volt ESF Bus #3AB3-S
2. 480-volt ESF Bus #3AB31-S

Action a. requires that "With one of the required divisions of A.C. ESF busses not fully energized, reenergize the division within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours."

The licensee proposed to revise TS 3.8.3.1, ACTION a. by increasing the completion time from 8 hours to 3 days for an unenergized A.C. ESF bus to be reenergized. In LAR Enclosure 1, Table E1-1 for TS 3.8.3.1, Conditions a., b., or c. the DSC requires "One Train of AC power supplying safety related equipment." The DSC is for minimum AC power sources to address licensed design basis accident (DBA) which is either train A or B not C since it's not redundant with either of train A or B per UFSAR Sections 8.3.1.1.1.a), 8.3.1.1.1.b), and 8.3.1.1.1.c).

Please revise TS 3.8.3.1, Conditions a., b., or c. as follows, or provide justification why these revisions are not necessary:

a) to delete Condition c. from column "Proposed TS LCO Condition."

b) for Conditions a. and b., the DSC to clearly indicate the applicable trains (e.g., "One Train either A or B of AC ESF power supplying safety related equipment.")

<u>EEEB Question 04 - TS 3.8.3.1, Conditions d., e., f., g., and h</u>

TS LCO 3.8.3.1 requires, in part, the following 120-volt A.C. Static Uninterruptible Power Supply (SUPS) busses shall be energized:

d. 120-volt A.C. SUPS Bus #3MA-S energized from its associated inverter connected to D.C. Bus #3A-DC-S*.

e. 120-volt A.C. SUPS Bus #3MB-S energized from its associated inverter connected to D.C. Bus #3B-DC-S*.

f. 120-volt A.C. SUPS Bus #3MC-S energized from its associated inverter connected to D.C. Bus #3A-DC-S*.

g. 120-volt A.C. SUPS-Bus #3MD-S energized from its associated inverter connected to D.C. Bus #3B-DC-S*.

h. 120-volt A.C. SUPS Bus #3A-S energized from its associated inverter connected to D.C. Bus #3A-DC-S.

i. 120-volt A.C. SUPS Bus #3B-S energized from its associated inverter connected to D.C Bus #3B-DC-S.
Action b. requires that:

> With one A.C. SUPS bus either not energized from its associated inverter, or with the inverter not connected to its associated D.C. bus: (1) reenergize the A.C. SUPS bus within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours and (2) reenergize the A.C. SUPS bus from its associated inverter connected to its associated D.C. bus within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed to revise TS 3.8.3.1, ACTION b. by increasing the completion time from 2 hours to 12 days for an unenergized 120-volt A.C. SUPS bus to be reenergized. In LAR Enclosure 1, Table E1-1 for TS 3.8.3.1, Conditions d., e., f., g., or h. the DSC requires "At least two ESF power division available." The DSC is for the minimum power sources that must be available to address licensed design basis accident (DBA). Based on UFSAR Section 8.3.1.1.1.c), TS 3.8.3.1 pertains only to Conditions d., e., f., and g., not Conditions h. and i, with those four Conditions being for the AC SUPS buses for the Plant Protection System.

Please revise TS 3.8.3.1, Conditions d., e., f., g., and h, as follows, or provide justification why these revisions are not necessary:

a) to delete Condition h. from column "Proposed TS LCO Condition" for those Conditions supplying Plant Protection System.

b) to clarify the DSC as to what is meant by "At least two ESF power division available," and to address whether this should refer to minimum AC SUPS buses to maintain functionality of Plant Protection System.

c) to add Conditions h. and i. as separate line items and clearly indicate in new DSC minimum AC SUPS buses required to address DBA and safe shutdown if to be included in this LAR.

d) please clarify how SUPS 3A1-S and SB1-S factor into this TS and how that should be reflected here.

<u>EEEB Question 05 - TS 3.8.3.1, Conditions j., k., or l</u>

TS LCO 3.8.3.1 requires, in part, the following Static Uninterruptible Power Supply (SUPS) busses shall be energized:

j. 125-volt D.C. Bus #3A-DC-S connected to Battery Bank #3A-S.

k. 125-volt D.C. Bus #3B-DC-S connected to Battery Bank #3B-S.

l. 125-volt D.C. Bus #3AB-DC-S connected to Battery Bank #3AB-S.

Action c. requires that "With one D.C. bus not connected to its associated battery bank, reconnect the D.C. bus from its associated OPERABLE battery bank within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours."

The licensee proposed to revise TS 3.8.3.1, ACTION c. by increasing the completion time from 2 hours to 1 day for 125-volt D.C. bus not connected to its respective battery and to be reconnected. In LAR Enclosure 1, Table E1-1 for TS 3.8.3.1, Conditions j., k., and l. the DSC requires "At least one DC distribution system available to support safe shutdown." The DSC is for minimum power sources to address licensed design basis accident (DBA) which is either of the two redundant 125-batteries battery 3A-S or 3B-S not battery 3AB-S since it's not redundant with the other two batteries per UFSAR Tables 8.3-3 and 8.3-4.

Please revise TS 3.8.3.1, Conditions j., k., or l. as follows, or provide justification why these revisions are not necessary:

a) to delete Condition l. from column "Proposed TS LCO Condition."

b) for Conditions j. and k., clearly indicate in the DSC the systems to support safe shutdown (e.g., "At least one of two redundant 125V DC distribution systems available to support safe shutdown.")

Division of Safety Systems (DSS)
Technical Specifications Branch (STSB) Questions

STSB Question 01 – Proposed Administrative Controls

In Attachment 2 of the LAR, the licensee provided a mark-up of the proposed Technical Specification changes. Provide the following:

a) The mark-up for TS 3.4.3.1, "Pressurizer," has an arrow pointing to Action "a" with no "insert" or change description. Clarify the intent of the arrow.

b) The proposed administrative controls for the Risk Informed Completion Time (RICT) Program in TS 6.5.19 paragraph "e" of Attachment 2 of the LAR was based on the TS markups of TSTF-505, Revision 2 for Waterford. The NRC staff recognizes that the model SE for TSTF-505, Revision 2 contains improved phrasing for the administrative controls for the RICT Program in TS 5.5.18 paragraph "e," namely the phrasing "approved for use with this program" instead of "used to support this license amendment." In lieu of the proposed phrasing in TS 6.5.19 paragraph "e", discuss whether the phrases "used to support Amendment # xxx" or, as discussed in the TSTF 505 model SE, "approved for use with this program" would provide more clarity for this paragraph.

STSB Question 02 – Variations from TSTF-505

The NRC staff identified the following items as variations from NRC issued Technical Specifications Task Force (TSTF) Traveler TSTF-505, Revision 2, "Provide Risk-Informed

Extended Completion Times – RITSTF Initiative 4b." However, staff was unable to locate in the LAR or supplemental letter the justification for inclusion in the RICT Program.

a) TS 3.6.1.3, "Containment Air Locks": For Action a.1, the licensee did not list a specific equivalent condition in the Cross Reference Table (LAR Enclosure 13). It appears that the equivalent is TSTF-505 STS Condition 3.6.2.A, which is excluded from the RICT program (indicated by comments above its limiting condition for operation.) Provide a direct equivalent to a TSTF-505 STS condition included in the RICT program, or technical justification for the variation.

b) TS 3.6.1.7, "Containment Ventilation System": For Action "b," the licensee did not list a specific equivalent condition in the Cross Reference Table (LAR Enclosure 13). It appears that the equivalent action is TSTF-505 STS Condition 3.6.3.E, which is excluded from the RICT program (as indicated by comments above its limiting condition for operation.) Provide a direct equivalent to a TSTF-505 STS condition included in the RICT program, or technical justification for the variation.

c) TS 3.6.3, "Containment Ventilation System": In the Cross Reference Table (LAR Enclosure 13), the column that describes the Waterford TS Actions equivalent to the TSTF-505 STS 3.6.3 Conditions A, B, and D is blank. Provide a direct equivalent to each TSTF-505 STS condition included in the RICT program, or technical justification for the variation.

d) TS 3.6.3, "Containment Ventilation System": In the TS mark-up (LAR Attachment 2), the licensee did not propose to add the wording "following isolation" per TSTF-505 for Waterford Actions b, c, f, and g. Provide justification for this variation.

e) TS 3.7.6.1, "Control Room Emergency Air Filtration System": For Action "a," the licensee did not list a specific equivalent condition in the Cross Reference Table (LAR Enclosure 13). Provide a direct equivalent to a TSTF-505 STS condition included in the RICT program, or technical justification for the variation.

f) TS 3.7.6.3, "Control Room Air Temperature - Operating": For Action "a," the licensee did not list a specific equivalent condition in the Cross Reference Table (LAR Enclosure 13). Provide a direct equivalent to a TSTF-505 STS condition included in the RICT program, or technical justification for the variation.

<u>STSB Question 03 – Table E1-1 Revisions</u>

The following items pertain to Table E1-1 found in Enclosure 1 of the LAR.

a) In Table E1-1, each row should represent a separate TS Action for each proposed application of the RICT Program, have a clear description of the TS Condition (e.g., one essential services chilled water loop OPERABLE.), and a clear description of the design success criteria (e.g., one of two ECW trains operating to provide chilled water to safety related air handling units.). The design success criteria (DSC) column should contain the minimum equipment necessary to meet the system function given the condition (i.e., inoperable equipment). Provide an updated table to include the above information for each proposed application of the RICT Program.

b) The Table E1-1 line item for TS 3.7.4, Ultimate Heat Sink (UHS)," states in the Disposition column, "The action associated with basin level and temperature are not included in the RICT program. Only the fan operability is included." The TS mark-up does not indicate any differentiation between operability requirements. Please clarify how the Waterford TS will reflect that a RICT will only apply to the equipment indicated in Table E1-1.

c) TS actions 3.8.1.1.e and 3.8.1.1.c are not included in Table E1-1. Revise the table to include these items.

STSB Question 04 – Cross Reference Table

The Cross Reference Table in LAR Enclosure 13 does not show every Waterford Action proposed for inclusion in the RICT program compared to TSTF-505. Additionally, every plant specific variation should be identified as such, with justification for inclusion in the RICT Program. The NRC staff identified the following Actions that were included in the TS mark-up (LAR Attachment 2) and Table E1-1 (LAR Enclosure 1) but were not included in the Cross Reference Table: TS 3.6.1.3.a, TS 3.6.1.7.b, TSs 3.6.3.a through 3.6.3.g, TS 3.7.4.e, TS 3.7.6.1.a, and TS 3.7.6.3.a. Provide an updated Cross Reference Table with all proposed applications of the RICT program.

DSS Containment and Plant Systems Branch (SCPB) Questions

SCPB Question 01 – Proposed Changes to TS 3.6.3

The wording of proposed TS 3.6.3, Action e., f., or g. for penetrations not associated with closed systems does not appear to unambiguously ensure an operable containment isolation valve will be present in each containment penetration flow path, and, therefore, the action may not ensure maintenance of the containment isolation function during the proposed RICT. The statement prior to Action e. specifies that at least one isolation valve be maintained operable in each penetration that is open. However, this statement does not require an operable isolation valve in each containment penetration flow path, as specified in standard TS 3.6.3, Condition A, cited in TSTF-505. Therefore, the NRC staff notes that the action could be entered under a condition representing a loss of containment function because penetrations with more than one flow path may not have an operable barrier in each flow path.

a) Provide justification of the TS 3.6.3 statement as ensuring each penetration flow path would have an operable isolation valve or clarify the Action statement to limit the applicability of the proposed RICTs to conditions that would not result in a loss of containment function.

SCPB Question 02 – Proposed Changes to TS 3.6.1.7.b

The wording of proposed TS Action 3.6.1.7.b appears ambiguous because it does not clearly limit the number of inoperable valves to only one of the two purge valves for the purge exhaust penetration. The NRC staff considered the action ambiguous because it begins with the statement "With a containment purge supply and/or exhaust isolation valve(s) having a measured leakage rate exceeding the limits...", and the staff determined that two exhaust isolation valves with excessive leakage could satisfy this condition statement. Therefore, the staff found that the action could be entered under a condition representing a loss of containment function because redundant exhaust valves in one penetration could have excessive leakage.

a) Provide justification of the statement as applying only when no more than one valve per penetration has excessive leakage or clarify the Action statement to limit the applicability of the proposed risk-informed completion times to conditions that would not result in a loss of containment function.

SCPB Question 03 – Proposed Changes to TS 3.7.1.2.d

Proposed changes to TS Action 3.7.1.2.d to apply an RICT to conditions where the emergency feedwater (EFW) system is inoperable for reasons other than those conditions described in Actions a., b., and c., which involve inoperability of one of two steam supplies to the turbine-driven EFW pump combined with zero, one, and two motor-driven EFW pumps, respectively. In addition, TS Action 3.7.1.2.d. states that the EFW system is able to deliver at least 100 percent flow to either SG. The bases for TS 3.7.1.2 (ADAMS Accession No. ML020660508) address conditions involving inoperability of the turbine-driven EFW pump, inoperability of both motor-driven EFW pumps, or inoperability of one of two redundant flow paths. Table E1-2, "In Scope TS/LCO Conditions RICT Estimate," in Enclosure 1 to the LAR indicated an estimated RICT for this action not involving inoperable pumps.

a) Provide clarification of the condition assumed for evaluation of the 10-day estimated RICT for Action d. (not pump related) and how the estimated completion times would change for conditions involving inoperability of the turbine-driven EFW pump alone for reasons other than one inoperable steam supply and, separately, inoperability of both motor driven EFW pumps.

SCPB Question 04 – Proposed Changes to TS 3.7.4.e

The proposed TS changes provided in Attachment 2 to the LAR indicate addition of the RICT provision to TS Action 3.7.4.e, which applies when either or both wet cooling tower basin cross-connect valves are not operable for makeup. However, Tables E1-1 and E1-2 in Enclosure 1, and Enclosure 13, "Waterford 3 to Standard Technical Specification Cross Reference," do not address that condition. Also. the specific proposed changes are not listed in Attachment 1, "Description and Assessment of the Proposed Change," to the LAR.

a) Provide clarification if TS Action 3.7.4.e was intended to be within the scope of the proposed amendment request and provide appropriate supporting information if Action e. was intended to be within the LAR scope.

SCPB Question 05 – Proposed Changes to TS 3.7.6.1

For the proposed change to TS 3.7.6.1, Action a. is related to the control room emergency air filtration system. The filtration system provides control room isolation for protection from toxic gases and smoke, smoke purge for fires in the control room vicinity, and filtration of outside air during radiological releases from design basis events. Table E1-1 in Enclosure 1, includes the following note: "All the components in the MCR [main control room] HVAC [heating, ventilation, and air conditioning]/filtration system are not in the PRA model, but several Air Handling Units (AHUs), fans, and dampers are included allowing for a bounding evaluation using the CRMP." However, Enclosure 4, Table E4-1, indicated that toxic gas events were excluded from the PRA model supporting the CRMP based on low frequency of occurrence. Although the smoke removal function may be bounded in the fire PRA, the radiological protection function does not appear to be adequately represented by consideration of core damage and large early release frequencies.

a) Please describe the initiating events and functions performed by the main control room emergency filtration system that are modeled in the CRMP tool and how the RICT reflects the importance of the functions of the control room emergency air filtration system analyzed in the safety analysis report, consistent with 10 CFR 50.36(b).

SCPB Question 06 – Proposed Changes to TS 3.7.6.3

The proposed change to TS 3.7.6.3 Action a. for the control room air conditioning system would permit application of a risk-informed completion time for one inoperable air conditioning train. Section 9.4.1.1 of the Waterford UFSAR states, in part, that the control room air conditioning system was designed to "permit personnel occupancy, proper functioning of instrumentation and controls, and prevent the accumulation of flammable gases during all normal and design basis accident conditions…." Table E1-1 in Enclosure 1, "List of Revised Required Actions to Corresponding PRA Functions," includes the following note: "All the components in the [main control room] MCR HVAC/filtration system are not in the PRA model, but several Air Handling Units (AHUs), fans, and dampers are included allowing for a bounding evaluation using the CRMP [Configuration Risk Management Program]."

a) Please describe how the bounding evaluation was conducted, including how heat-degraded performance, which could affect both control room personnel performing essential accident mitigation functions and necessary control room instrumentation and controls, was modeled in the CRMP.

b) Provide justification that the evaluation is bounding with respect to potential impacts from high control room temperatures.