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June 14, 2018

Dominion Energy®

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Serial No. 18-230A
NRA/WDC R0
Docket No. 50-336
License No. DPR-65

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST TO REVISE INTEGRATED LEAK RATE TEST (TYPE A) AND TYPE C TEST INTERVALS

By letter dated October 4, 2017, Dominion Energy Nuclear Connecticut, Inc. (DENC) requested a license amendment in the form of changes to the Millstone Power Station Unit 2 (MPS2) Technical Specifications (TSs) for facility Operating License DPR-65. This proposed amendment would allow DENC to extend the Type A primary containment integrated leak rate test interval for MPS2 to 15 years and the Type C local leak rate test interval to 75 months, and incorporates the regulatory positions stated in RG 1.163.

In an email dated May 14, 2018, the NRC transmitted a request for additional information (RAI) related to the license amendment request. The RAI contained six questions. DENC responded to RAI-06 in a letter dated May 24, 2018. Attachment 1 to this letter provides DENC's response to the remaining RAI questions, RAI-01 through RAI-05.

Should you have any questions in regard to this submittal, please contact Wanda Craft at (804) 273-4687.

Sincerely,

Mark D. Sartain
Vice President – Nuclear Engineering & Fleet Support

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Mark D. Sartain, who is Vice President - Nuclear Engineering & Fleet Support of Dominion Energy Nuclear Connecticut, Inc. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 14th day of June, 2018.

My Commission Expires: August 31, 2019.

Notary Public

GARY DON MILLER
Notary Public
Commonwealth of Virginia
Reg. # 7629412
My Commission Expires August 31, 2019

A001
NRR

Attachment:

1. Response to Request for Additional Information Regarding License Amendment Request to Revise Integrated Leak Rate Test (Type A) and Type C Test Intervals (RAI-01 through RAI-05)

Commitments made in this letter: None

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ATTACHMENT 1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST TO REVISE INTEGRATED LEAK RATE TEST (TYPE A) AND TYPE C TEST INTERVALS (RAI-01 through RAI-05)

DOMINION ENERGY NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2

By letter dated October 4, 2017, Dominion Energy Nuclear Connecticut, Inc. (DENC) requested a license amendment in the form of changes to the Millstone Power Station Unit 2 (MPS2) Technical Specifications (TSs) for facility Operating License DPR-65. The proposed amendment revises MPS2 TS 6.19, "Containment Leakage Rate Testing Program," by replacing the reference to Regulatory Guide (RG) 1.163 (September 1995) with a reference to Nuclear Energy Institute (NEI) topical report NEI 94-01, Revision 3-A and the limitations and conditions specified in NEI 94-01, Revision 2-A, as the implementing documents used to develop the MPS2 performance-based leakage testing program in accordance with 10 CFR 50, Appendix J, Option B. This proposed amendment would allow DENC to extend the Type A primary containment integrated leak rate test (ILRT) interval for MPS2 to 15 years and the Type C local leak rate test interval to 75 months, and incorporates the regulatory positions stated in RG 1.163.

In an email dated May 14, 2018, the NRC transmitted a request for additional information (RAI) related to the license amendment request (LAR). The RAI contained six questions. DENC responded to RAI-06 in a letter dated May 24, 2018. This attachment provides DENC's response to the remaining RAI questions, RAI-01 through RAI-05.

Background

In the safety evaluation (SE) issued on June 25, 2008 (ADAMS Accession No. ML081140105), the U.S. Nuclear Regulatory Commission (NRC) staff found the methodology in NEI 94-01, Revision 2, and EPRI Report No. 1009325, Revision 2, acceptable for referencing by licensees proposing to amend their TSs to permanently extend the ILRT interval to 15 years, provided certain conditions are satisfied. Condition 1, set forth in Section 4.2 of the SE for EPRI Report No. 1009325, Revision 2, states that the licensee should submit documentation indicating that the technical adequacy of their probabilistic risk assessment (PRA) is consistent with the guidance in Regulatory Guide (RG) 1.200, relevant to the ILRT extension application. Revision 2 of RG 1.200 endorses, with clarifications and qualifications, the American Society of Mechanical Engineers/American Nuclear Society (ASME/ANS) PRA Standard RA-Sa-2009.

The information provided in the LAR is not sufficient for the NRC staff to reasonably determine that the licensee's PRA is consistent with the guidance in RG 1.200, Rev. 2, and therefore, cannot assess the technical acceptability of the licensee's PRA for use in support of this application. The following requests for additional information (RAIs) outline the information needed for the NRC staff to complete its review:

RAI-01

The licensee's LAR does not discuss changes made to the internal events and internal flooding PRA since the 2000 full-scope peer review.

a) *Provide an overview of all changes in the internal events and internal flooding PRA since the 2000 full scope peer review that were not subject to the 2012 focused-scope peer review and provide justification as to whether any of these changes fit the definition of a PRA upgrade.*

b) *For each upgrade identified in item a. above, provide the results of the focused-scope peer review(s) performed on these upgrades and the disposition of any findings for the application.*

DENC Response

a) The following table summarizes the changes made to the MPS2 PRA model between the 2000 full scope peer review and the 2018 focused scope peer review that were not subject to either the 2012 or 2018 focused scope peer review. None of these changes meet the definition of a PRA upgrade. ASME/ANS RA-Sa-2009 Non-Mandatory Appendix 1-A was used as guidance for making the determination of PRA maintenance versus upgrade. Specific examples from Section 1-A.3 of the ASME/ANS RA-Sa-2009 have been listed below to provide justification for classification of these items as PRA maintenance.

Date / Model	Element	Summary of Change	PRA Maintenance Justification**
2000/ Rev 1	IE	Updated Loss of Normal Power (LNP) initiating event frequency with plant specific data.	Update of plant-specific data, similar to Example 2
2001/ Rev 2	DA	Added various equipment unavailability (Test & Maintenance) events to the model to account for scheduled maintenance activities.	Correct omission, similar to Example 7
2001/ Rev 2	IE	LNP logic was subdivided to differentiate between grid-related and weather-related LNP events.	Replace initiating events, similar to Example 1
2005/M205A	DA	Data update including reliability and unavailability.	Data update, similar to Examples 2 and 3
2005/M205A	IE	Data update for initiating events.	Data update, similar to Examples 2 and 3
2005/M205A	DA	Added new common cause failure (CCF) basic events for various components – transformers, batteries, and auxiliary feedwater (AFW) pumps.	Correct omission, similar to Example 25
2006/M205Aa	DA	Corrected the plant specific data for unavailability of an emergency bus.	Model error, similar to Example 6

Date / Model	Element	Summary of Change	PRA Maintenance Justification**
2010/M209A	DA	Applied the generic failure probability distributions and component boundaries defined in NUREG/CR-6928 throughout the model.	Application of generic data, similar to Example 3
2010/M209A	DA	Updated the reliability and unavailability data with plant-specific data from January 1, 2000 to December 31, 2009.	Update of plant-specific data, similar to Example 2
2010/M209A	IE	Recalculated the plant capacity factor.	Update of plant-specific data, similar to Example 2
2010/M209A	IE	Updated the initiating event frequencies in the model based on new data.	Update of initiating event data, similar to Examples 2 and 3
2010/M209Aa	SC	Created a new MAAP4 case to update the success criteria for transient sequences.	New thermal hydraulic case, similar to Example 10 but for PWR instead of BWR
2011/M209Ab	IE	Added detail to the Reactor Coolant Pump (RCP) Thermal Barrier Interfacing System Loss of Coolant Accidents (ISLOCA) model and revised the associated success criteria and modeled components.	Enhancement for completeness, similar to Example 7
2011/M209Ab	SC	Generated a new MAAP case for steam generator tube rupture with failed isolation and failed cooldown, but with high pressure safety injection throttled.	New thermal hydraulic case, similar to Example 10 but for PWR instead of BWR
2012/M209Ac	DA	Corrected the modeled emergency diesel generator (EDG) failure rate.	Model error, similar to Example 6
2017/MPS2-R05d	DA	Updated the RCP Seal Loss of Coolant Accident (LOCA) probability based on WCAP 15749-P R1. Credited power recovery during Station Blackout (SBO) sequences involving RCP Seal LOCA.	Update of generic data, similar to Example 3 / Enhancement for completeness, similar to Example 7

Date / Model	Element	Summary of Change	PRA Maintenance Justification**
2017/MPS2-R05d	DA	Updated the probability of failure to electrically trip the reactor based on CE NPSD-277.	Update of generic data, similar to Example 3
2017/MPS2-R05d	IE	Added Loss of Direct Current initiators to SBO accident sequences.	New initiators, similar to Example 1
2017/MPS2-R05e	DA	Added a number of Common Cause Failure (CCF) events to the model for components that had previously only been considered for independent failures.	Correct omission, similar to Example 25
2017/MPS2-R05e	IE	Updated the Steam Generator Tube Ruptures (SGTR) event frequency to a generic industry standard value.	Application of generic data, similar to Example 3
2017/MPS2-R05e	LE	Created explicit Plant Damage State (PDS) logic such that Large Early Release Frequency (LERF) contribution by PDS could be determined from the model.	Enhancement for completeness, similar to Examples 6 and 15
2017/MPS2-R05e	LE	Simplified the containment isolation model by removing credit for all containment isolation valves that require an operator action to close.	Enhancement that streamlines the model, similar to Examples 6 and 15
2018/MPS2-R05f	DA	Minor correction to AFW CCF failure probabilities and MPS3 EDG failure probabilities (supporting MPS2 in certain sequences).	Model error, similar to Example 6
2018/MPS2-R05f	IE	Updated initiating event frequencies that utilize generic industry values with the latest industry data.	Update of generic data, similar to Example 3
2018/MPS2-R05f	IE	Minor correction made to some support system initiator frequencies.	Model error, similar to Example 6

Date / Model	Element	Summary of Change	PRA Maintenance Justification**
2018/MPS2-R05g	IE	Included spurious operation of power-operated relief valves and safety valves as small break LOCA (SBLOCA) initiating events. Merged RCP Seal LOCAs into SBLOCA sequences.	Correct omission, similar to Example 7

** Refer to ASME/ANS RA-Sa-2009 Non-Mandatory Appendix 1-A.3 for a list of example PRA changes

b) No upgrades were identified which have not received a peer review. Refer to the DENC response to RAI-06 for a summary of the most recent peer review results and disposition of findings for this application.

RAI-02

In order to ensure efficiency in its reviews and prevent duplicate reviews of a licensee's PRA technical acceptability, the NRC staff may utilize PRA information from the licensee's previous risk-informed submittals. In the course of its review for this LAR, the staff utilized information from a previous risk-informed LAR submitted by the licensee in October 2014 (ADAMS Accession No. ML14301A112). On page 1 of Attachment 2 of the 2014 LAR, the licensee states that the MPS2 Internal Events PRA (IEPRA) underwent a full-scope peer review in 2000 and that the peer review team used the Combustion Engineering Owner's Group (CEOG) Peer Review Process Guidance as the basis for the review. However, Section 4.6.2 of Attachment 1 to the current LAR states that the MPS2 IEPRA model underwent a peer review by the Combustion Engineering Owners Group (CEOG) in 2000 using the NEI 00-02 PRA Peer Review Process Guidance. The CEOG peer review guidance is not endorsed by the NRC, and there is no approved correlation available between the compliance levels in CEOG peer review and the RA-Sa-2009 CC levels.

a) Clarify whether the 2000 peer review of the IEPRA used the CEOG PRA standard or the standard in NEI 00-02.

b) If the IEPRA 2000 peer review was performed against the CEOG standard, describe and justify how the licensee concluded that its IEPRA is acceptable for use in supporting this application in accordance with RG 1.200 Revision 2, given that the IEPRA has not undergone an independent full-scope peer review against an NRC endorsed industry PRA standard.

DENC Response

a) The MPS2 PRA model was originally peer reviewed in 2000 using the CEOG peer review process.

b) The IEPRA is considered acceptable for use in supporting this application because DENC has performed full-scope self-assessments of the MPS2 PRA model in 2007 and 2011 against the requirements of ASME RA-Sb-2005/RG 1.200, Rev. 1 and ASME/ANS Ra-Sa-2009/RG 1.200, Rev. 2, respectively. The 2007 self-assessment was led by Maracor, a vendor that provided a team of experts with experience in performing NEI PRA certifications and ASME PRA standard reviews, with Dominion providing a review of the assessment. In 2011, instead of performing a gap assessment to ASME/ANS RA-Sa-2009 requirements as described in NEI 05-04, Section 3.3, DENC performed a full-scope self-assessment of the MPS2 PRA model against the 316 supporting requirements in ASME/ANS Ra-Sa-2009/ RG 1.200 Rev 2.

RAI-03

As referenced in RAI-02 above, the staff utilized information from the October 2014 risk-informed LAR. Table 1 of Attachment 2 of the 2014 LAR only lists one open finding and observation (F&O) from the 2000 IEPRA full-scope peer review. However, Table 7-2 of Attachment 4 of the current LAR lists over 80 open F&Os from the 2000 IEPRA peer review. Discuss the discrepancy in the number of open F&Os from the 2000 IEPRA peer review, and clarify the number of open F&Os that are applicable to this application.

DENC Response

The 2014 LAR provided disposition of the only F&O from the 2000 peer review that was unresolved at the time. As described in the 2014 LAR, the remainder of the A/B significance-level F&Os were resolved and not listed. Attachment 4 Table 7-2 of the ILRT LAR lists 81 F&Os from the 2000 peer review, all of which are resolved including the one previously unresolved F&O identified in the 2014 LAR (i.e., finding number AS-10).

RAI-04

Section 4.6.2 of Attachment 1 to the LAR states that the MPS2 IEPRA model underwent a self-assessment in 2007 against ASME/ANS PRA Standard RA-Sb-2005 and RG 1.200 Revision1, a gap assessment in 2011 against ASME/ANS PRA Standard RA-Sa-2009 and RG 1.200, Revision 2, and a focused-scope peer review in 2012 against the ASME/ANS PRA Standard RA-Sa-2009 and RG 1.200 Revision 2. However, Notes 1 and 2 to Table 7-1 of Attachment 4 to the LAR reference a 2009 self-assessment.

a) *Clarify whether the licensee performed a self-assessment of its IEPRA in 2009.*

b) *If the licensee did perform a self-assessment of its IEPRA in 2009, provide a discussion describing the purpose of the self-assessment, and any technical issues identified with the PRA that would affect this application.*

DENC Response

a) DENC did not perform a self-assessment in 2009. The discussion provided in Section 4.6.2 is accurate with respect to the self-assessments performed in 2007 and 2011. The intent of Notes 1 and 2 to Table 7-1 of Attachment 4 to the LAR was to reference the 2007 self-assessment.

b) DENC did not perform a self-assessment in 2009.

RAI-05

EPRI Report No. 1009325, Revision 2-A states that "[w]here possible, the analysis should include a quantitative assessment of the contribution of external events (e.g., fire and seismic) in the risk impact assessment for extended ILRT intervals. For example, where a licensee possesses a quantitative fire analysis, and that analysis is of sufficient quality and detail to assess the impact, the methods used to obtain the impact from internal events should be applied for the external event." EPRI Report No. 1009325, Revision 2-A further states that the "assessment can be taken from existing, previously submitted and approved analyses or another alternate method of assessing an order of magnitude estimate for contribution of the external event to the impact of the changed interval." In Section 5.7 of Attachment 3 to the LAR, the licensee performed an assessment of external event contribution. The licensee's analysis reflected the contribution from internal fire and seismic events, but did not include a discussion of, or justification for, screening out all other external hazards (high winds, external flooding, transportation events, aircraft, industrial facilities, and other external hazard groups). Provide the following:

a) A discussion of the contribution to risk from high winds, external floods, and other external events, OR

b) A justification explaining how the licensee screened out each hazard group consistent with RG 1.200 using the most current information, risk studies and insights.

DENC Response

b) External hazards other than seismic and internal fire were screened from applicability to MPS2 per the Individual Plant Examination of External Events (IPEEE) performed in accordance with Generic Letter 88-20 Supplement 4 and affirmed using the progressive screening approach specified in ASME PRA Standard RA-Sa-2009. Table 1 provides a summary of the screening results for the other external hazards and Table 2 provides the definition of the screening criterion codes used in Table 1.

Table 1: External Hazard Screening Results

External Hazard	Screening Result		
	Screened? (Y/N)	Screening Criterion (Note a)	Comment
Aircraft Impact	Y	PS2	Airport hazard meets 1975 standard review plan (SRP) requirements. Airports, military installations and flight corridors around MPS2 (including Groton Airport) have been considered. Evaluations of aircraft impact associated with these facilities find that it does not pose a significant hazard.
Avalanche	Y	C3	Not applicable to site because of topology. MPS2 is located on the Long Island Sound with no hilly or mountainous terrain near the site. Avalanches are not a viable external initiator.
Biological Event	Y	C1, C5	Plant design accounts for biological growth. Slowly developing growth can be detected and mitigated by surveillance. The circulating water system intake structure incorporates several features to control biological fouling including trash racks and traveling screens, a cutoff wall to prevent ecologically rich surface water from entering the system, exit passages for fish are provided, vertical guides allow individual channels to be drained, and a chlorination system for biocide treatments.
Coastal Erosion	Y	C5	Slowly developing event which can be detected and mitigated by surveillance.
Drought	Y	C1, C5	Plant design eliminates drought as a concern and this event is slowly developing. The ultimate heat sink (UHS) is the Long Island Sound which is unaffected by drought since it communicates with the Atlantic Ocean.
External Flooding	Y	PS2	The IPEEE documented that most external flooding hazards meet the 1975 SRP requirements or the plant is designed against the hazards. As part of the NRC 10 CFR 50.54(f) request

External Hazard	Screening Result		
	Screened? (Y/N)	Screening Criterion (Note a)	Comment
			on Reevaluation of External Floods, Dominion Energy is in the process of evaluating the external flooding hazard at Millstone, which includes storm surge, water ponding, local intense precipitation, etc. Currently there are no identified plant modifications or deficiencies that would preclude screening of the external flooding hazard. As part of the reevaluation, any identified discrepancies will be tracked in the corrective action program.
Extreme Wind or Tornado	Y	C1, PS4	The wind loadings for the structures are based on American Society of Civil Engineers Paper 3269, "Wind Forces on Structures." The basic design wind velocity for MPS2 Class 1 structures is 115 mph with gusts up to 140 mph. MPS2 structures are designed for tornados having a maximum rotational velocity of 300 mph and a maximum translational velocity of 60 mph. This design basis tornado has a frequency less than 1E-6/yr at MPS2. Failure of a service water pump due to missile strike is bounded by 1E-6/yr. Failure of both EDGs due to missile strike is bounded by 1E-6/yr. Failure of the EDG room ventilation due to tornado is bounded by 1E-6/yr. CDF due to tornado-induced failure of the East 480V switchgear room ventilation is bounded by 1E-6/yr. Control Room ventilation failure is not a significant contributor to risk because of alternate means of Control Room cooling and the ability to shut down outside the Control Room.
Fog	Y	PS2, C1	Fog can be a contributor to transportation accidents. Transportation accidents meet the criteria of the 1975 SRP.

External Hazard	Screening Result		
	Screened? (Y/N)	Screening Criterion (Note a)	Comment
			Deep draft boats must stay at least 2 miles offshore to avoid running aground on Bartlett Reef. Therefore, a boat that could cause significant damage to the intake structure is highly unlikely to collide with it and would, most likely, run aground first.
Forest or Range Fire	Y	C3	Site is cleared preventing fire from propagating onto the site and is not located in forested or grassland area.
Frost	Y	C4	Frost is covered under snow and ice hazards.
Hail	Y	C2	Loss of offsite power (LOOP) events associated with hail are addressed in the Internal Events PRA and the occurrence frequency is enveloped by the frequency of weather-induced LOOP events. Limited occurrences are bounded by other events for which the plant is designed.
High Summer Temperature	Y	C1, C5	The plant is designed for this hazard. Ventilation systems provide conditioned air in the plant to cool equipment. Weather-induced LOOP events are considered in the Internal Events PRA. Effects on the UHS are slow to develop if they develop at all because of the size of the Long Island Sound.
High Tide	Y	C4	High tide is covered by external flooding considering storm surge.
Hurricane	Y	C4	Hurricane is covered by external flooding and high winds or tornado.
Ice Cover	Y	C1, C4	The plant is designed against freezing temperatures, including procedures to protect ventilation systems. Ice blockage causing flooding is covered under external flooding.

External Hazard	Screening Result		
	Screened? (Y/N)	Screening Criterion (Note a)	Comment
Industrial or Military Facility Accident	Y	PS2	Explosive hazard impacts and control room habitability impacts meet 1975 SRP requirements (RG 1.78 and 1.91). Industrial facilities are too distant to pose a hazard to the safe operation of the plant. Nearby military facilities do not conduct operations that could potentially pose a hazard to the safe operation of the plant.
Internal Flooding	N	None	PRAs addressing internal flooding have indicated this hazard typically results in CDFs ≥ 1E-6/yr. Also, the ASME/ANS PRA Standard requires a detailed PRA for this hazard which is addressed in the MPS2 Internal Flooding PRA.
Internal Fire	N	None	PRAs addressing internal fire have indicated this hazard typically results in CDFs ≥ 1E-6/yr. The Internal Fire Event contribution was discussed in Section 5.7 of Attachment 3 to the LAR.
Landslide	Y	C3	Not applicable to the site because of topography.
Lightning	Y	C1, C4	Lightning strikes causing a LOOP or turbine trip are contributors to the initiating event frequencies for these events. However, other causes are included. The impacts are no greater than those already modeled in the internal events PRA. Additionally, MPS2 does not have a specific vulnerability to lightning and does not have unique features that would create a high likelihood of failing safety-related systems, structures, or components concurrent with a LOOP.
Low Lake Level or River Stage	Y	C3	Not applicable to site because of location. MP2 is located on the coast of the Long Island Sound which is virtually unaffected by lack of precipitation.
Low Winter Temperature	Y	C1, C5	The plant is designed for this hazard.

External Hazard	Screening Result		
	Screened? (Y/N)	Screening Criterion (Note a)	Comment
			Potential pipe freezing is addressed by a requirement for heat tracing operability during cold weather. Impacts on the UHS are slow to develop, if it all, due to the size and salinity of the Long Island Sound.
Meteorite or Satellite Impact	Y	C2, PS4	Event occurrence frequency of meteorites greater than 100 lbs. striking the plant is 7E-9/yr. This frequency is very low in absolute terms and lower than aircraft impacts. Aircraft impact damage envelops meteorite/satellite impact damage. The site is no more likely to be struck by meteorite/satellite than any other site.
Pipeline Accident	Y	C3	Pipelines are not close enough to significantly impact plant structures.
Release of Chemicals in Onsite Storage	Y	PS2	Plant storage of chemicals meets 1975 SRP requirements (RG 1.78 and 1.91). Control room habitability during postulated chemical releases has been evaluated and it has been determined that habitability is not threatened by this hazard.
River Diversion	Y	C3	Not applicable to the site because of location. There are no river diversions near MPS2. Cooling water is supplied directly from the Long Island Sound.
Sand or Dust Storm	Y	C3	Not applicable to the site because of location. MPS2 is not subject to sand or dust storms.
Seiche	Y	C3	Not applicable to the site because of location. A seiche in the Long Island Sound or the discharge basin was evaluated and is not a hazard for these bodies of water because of their geometry and locations relative to seiche-inducing phenomena.

External Hazard	Screening Result		
	Screened? (Y/N)	Screening Criterion (Note a)	Comment
Seismic Activity	N	None	PRAs addressing seismic activity have indicated this hazard typically results in CDFs ≥ 1E-6/yr. The seismic event contribution was discussed in Section 5.7 of Attachment 3 to the LAR.
Snow	Y	C1, C4	Event damage potential is less than other events for which the plant is designed. Potential flooding impacts are covered under external flooding.
Soil Shrink-Swell Consolidation	Y	C1	Plant is designed for this hazard. The MPS2 FSAR Chapter 2.7 describes the characteristics of the area geology, soil conditions, testing, foundations and backfill. Allowable bearing pressures for soil-supported structures are greater than contact pressures as determined by backfill testing. The potential for this hazard is low.
Storm Surge	Y	C4	Storm surge is covered by external flooding.
Toxic Gas	Y	C4	Toxic gas is addressed by the industrial or military facility accident, the release of chemicals in on-site storage, and the transportation accident. Control room habitability during postulated chemical releases has been evaluated and determined that habitability is not threatened by this hazard.
Transportation Accident	Y	PS2, C4	Potential hazards meet the 1975 SRP requirements. The hazards resulting from potential transportation accidents (i.e., highway, waterway, railroad, and air) do not contribute significantly to plant risk. Highway – The distance to the nearest highway exceeds the RG 1.91 safe distance criterion. Waterway – Most ships passing MPS2 are

External Hazard	Screening Result		
	Screened? (Y/N)	Screening Criterion (Note a)	Comment
			deep draft and must remain at least 2 miles offshore to avoid running aground. Railroad – Hazardous materials are transported about 0.25 miles from the protected area. Most of the transported hazardous materials (chlorine, anhydrous ammonia, carbon dioxide and carbon disulfide) meet the RG 1.78 screening criterion for low transport frequency. The remaining transported hazardous material (propane) presents negligible potential for damage due to explosion and is not a threat to control room habitability due to toxic gas plume. Air – Covered under aircraft impact.
Tsunami	Y	C4	Covered under external flooding.
Turbine-Generated Missiles	Y	PS4	Bounding analysis is used to show core damage frequency (CDF) for turbine generated missiles is less than 1E-6/yr.
Volcanic Activity	Y	C3	Not applicable to the site because of location. There are no volcanos within the vicinity of MPS2.
Waves	Y	C4	Waves are covered under external flooding.
Note a – See Table 2 below for descriptions of the screening criteria.			

Table 2: Progressive Screening Approach for Addressing External Hazards

Event Analysis	Criterion	Source	Comments
Initial Preliminary Screening	C1. Event damage potential is < events for which plant is designed.	NUREG/CR-2300 and ASME/ANS Standard RA-Sa-2009	
	C2. Event has lower mean frequency and no worse consequences than other events analyzed.	NUREG/CR-2300 and ASME/ANS Standard RA-Sa-2009	
	C3. Event cannot occur close enough to the plant to affect it.	NUREG/CR-2300 and ASME/ANS Standard RA-Sa-2009	
	C4. Event is included in the definition of another event.	NUREG/CR-2300 and ASME/ANS Standard RA-Sa-2009	Not used to screen. Used only to include within another event.
	C5. Event develops slowly, allowing adequate time to eliminate or mitigate the threat.	ASME/ANS Standard	
Progressive Screening	PS1. Design basis hazard cannot cause a core damage accident.	ASME/ANS Standard RA-Sa-2009	
	PS2. Design basis for the event meets the criteria in the NRC 1975 Standard Review Plan (SRP).	NUREG-1407 and ASME/ANS Standard RA-Sa-2009	
	PS3. Design basis event mean frequency is < 1E-5/y and the mean conditional core damage probability is < 0.1.	NUREG-1407 as modified in ASME/ANS Standard RA-Sa-2009	
	PS4. Bounding mean CDF is < 1E-6/y.	NUREG-1407 and ASME/ANS Standard RA-Sa-2009	
Detailed PRA	Screening not successful. PRA needs to meet requirements in the ASME/ANS PRA Standard.	NUREG-1407 and ASME/ANS Standard RA-Sa-2009	