RECOMMENDATION 2.1: OTHER NATURAL EXTERNAL HAZARDS

PURPOSE

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information request for the following purposes:

- To gather information pursuant to Near Term Task Force (NTTF) Recommendation 2.1, Staff Requirements Memoranda (SRM) associated with SECY-11-0124 and SECY-11-0137, as amended by the Energy and Water Development and Related Agencies Appropriations Act of 2012

- To collect information to facilitate NRC's determination if there is a need to update the design basis and systems, structures, and components (SSCs) important to safety to protect against the updated hazards at operating reactor sites

Pursuant to 10 CFR 50.54(f), addressees are required to submit a written response to this information request.

BACKGROUND

Present day NRC regulations require structures, systems, and components (SSCs) important to safety at nuclear power reactors to be designed to withstand the effects of natural phenomena, including extreme meteorological conditions (i.e., severe weather) such as hurricanes, tornadoes and waterspouts, thunderstorms, high wind events, lightning, and hail (including probable maximum size). Power reactor SSCs shall be designed considering the aforementioned external hazards, without losing their capability to perform their intended safety functions.

In response to the devastating event in Japan resulting from the earthquake and tsunami and its impact on the Fukushima Daiichi Nuclear Power Plant, the Commission established a Near-Term Task Force (NTTF) to conduct a systematic and methodical review of the NRCs processes and regulations to determine if additional improvements should be made to its regulatory system. The NTTF, as part of its review, was directed to provide any recommendations to the Commission for its policy direction, in light of the accident at the Fukushima Daiichi plant. In examining the accident for insights for reactors in the United States, the NTTF addressed protecting against accidents resulting from natural phenomena, mitigating the consequences of such accidents, and ensuring emergency preparedness.

The NTTF made 12 recommendations; in particular, recommendation 2 stated the following:

> "The Task Force recommends that the NRC require licensees to reevaluate and upgrade as necessary the design-basis seismic and flooding protection of SSCs for each operating reactor."

To ensure adequate protection from natural phenomena consistent with the present day state of knowledge and analytical methods, the Task Force recommended supporting actions to implement this recommendation to the Commission to prevent fuel damage and to ensure containment and spent fuel integrity. Of specific concern to this request, recommendation 2.1 states:

> "Order licensees to reevaluate the seismic and flooding hazards at their sites against current NRC requirements and guidance, and if necessary, update the design basis and SSCs important to safety to protect against the updated hazards."

The SRM for SECY-11-093, dated August 19, 2011, directed the staff, by September 9, 2011, to "identify and make recommendations regarding any NTTF recommendations that can, and in the staff's judgment, should be implemented, in part or in whole, without unnecessary delay." In SECY-11-0124, "Recommended Actions to be taken without Delay from the Near-Term Task Force Report," dated September 9, 2011, the NTTF recommended that 2.1 be completed without delay. The Commission agreed with the staff's recommendation to implement 2.1 in SRM-SECY-11-0124 issued on October 18, 2011, and requested that the staff explain the meaning of "vulnerability" when issuing the requests for information to licensees pursuant to 10 CFR 50.54(f) to identify actions that have been taken or are planned to address plant-specific vulnerabilities associated with the reevaluation of seismic and flooding hazards. The Commission also requested that the staff inform the Commission when it has developed the technical bases and acceptance criteria for implementing NTTF Recommendation 2.1.

In December 2011, the Energy and Water Development and Related Agencies Appropriations Act, passed both the House and the Senate making appropriations for the NRC for the remainder of the fiscal year which started on October 1, 2011. This act specifically added language directing the NRC to take the following actions:

> "The Nuclear Regulatory Commission shall require reactor licensees to re-evaluate the seismic, tsunami, flooding, and other external hazards at their sites against current applicable Commission requirements and guidance for such licenses as expeditiously as possible, and thereafter when appropriate, as determined by the Commission, and require each licensee to respond to the Commission that the design basis for each reactor meets the requirements of its license, current applicable Commission requirements and guidance for such license"

As a result, the NTTF recommendation 2.1 has been expanded to include other natural hazards (e.g., meteorological phenomena) that could impact the safety of power reactors in the United States.

Other background information relevant to this information request includes the individual plant examinations of external events (IPEEEs). On June 28, 1991, the NRC issued Supplement 4 to GL 88-20, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities," (ADAMS Accession No. ML031150485) requesting that each licensee identify and report to the NRC all plant-specific vulnerabilities to severe accidents caused by external events. The external events to be considered in the IPEEE were seismic events; internal fires;

and high winds, floods, and other external initiating events, including accidents related to transportation or nearby facilities and plant-unique hazards.

NUREG-1742, "Perspectives Gained from the Individual Plant Examination of External Events (IPEEE) Program," issued April 2002, (ADAMS Accession Nos. ML021270070 and ML021270674) provides insights gained by the NRC from the IPEEE program. Almost all licensees reported in their IPEEE submittals that no plant vulnerabilities were identified with respect to high winds, floods, and other external events (HFO) (the use of the term "vulnerability" varied widely among the IPEEE submittals). Most licensees screened out HFO events on the basis of qualitative assessments, consistent with one of the accepted approaches given in NUREG-1407, "Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities." A qualitative assessment typically involved demonstrating conformance with the 1975 SRP criteria and performing a plant walkdown. The purpose of the walkdown was to identify any changes to the plant configuration from the original design basis that might affect the IPEEE evaluation.

None of the 70 IPEEE submittals identified any HFO-related vulnerabilities; however, 34 submittals reported that they had either made, or were considering, a total of 64 HFO-related plant improvements. Of the 70 submittals, most indicated that some type of walkdown was performed for HFO events during the IPEEE. The submittals, however, did not provide detailed descriptions of the walkdown procedures and results. It should be noted that the term "vulnerability" was not defined in GL88-20. Instead, GL88-20 states that licensees should provide a discussion on how vulnerability is defined for each external event evaluated. NUREG-1742 notes that "as a result, the use of the term vulnerability varied widely among the IPEEE submittals…Some licensees avoided the term altogether, other stated that no vulnerabilities existed at their plant without defining the word, and still others provided a definition of vulnerability along with a discussion of their findings."

REGULATORY REQUIREMENTS

General Design Criterion (GDC) 2, "Design Bases for Protection Against Natural Phenomena," in Appendix A to Title 10 of the *Code of Federal Regulations,* Part 50 (10 CFR Part 50) states, in part, that SSCs important to safety shall be designed to withstand the effects of natural phenomena such as tornadoes and hurricanes without loss of capability to perform their safety functions. The design bases for these SSCs shall reflect appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated.

GDC 4, "Environmental and Dynamic Effects Design Bases," of Appendix A to 10 CFR Part 50 requires, in part, that SSCs that are important to safety be adequately protected against the effects of missiles resulting from events and conditions outside the plant.

GDC 44, "Cooling Water," of Appendix A to 10 CFR Part 50 states, in part, that a system to transfer heat from SSCs important to safety to an ultimate heat sink (UHS) shall be provided. The system safety function shall be to transfer the combined heat load of these SSCs under normal operating and accident conditions.

The regulations concerning reactor site criteria for stationary power reactor site applications filed on or after January 10, 1997 (Subpart B to 10 CFR Part 100) state, in part, that meteorological characteristics of the site that are necessary for safety analysis or that may have an impact upon plant design (such as maximum probable wind speed and precipitation) must be identified and characterized (§ 100.20(c)(2)). The regulations further state, in part, that the physical characteristics of the site, including meteorology, must be evaluated and site parameters established such that potential threats from such physical characteristics will pose no undue risk to the type of facility proposed to be located at the site (§ 100.21(d)).

DISCUSSION

The Energy and Water Development and Related Agencies Appropriations Act, 2012, directed NRC to "require reactor licensees to re-evaluate the seismic, tsunami, flooding, and other external hazards at their sites against current applicable Commission requirements and guidance for such licensees as expeditiously as possible, and thereafter, when appropriate, as determined by the Commission, and require each licensee to respond to the Commission that the design basis for each reactor meets the requirements of its license, current applicable Commission requirements and guidance for such license." These other external hazards can be considered to include meteorological phenomena such as wind and missile loads from tornadoes and hurricanes, maximum rainfall rates and snow and ice loads for roof design, extreme maximum and minimum ambient temperatures for normal plant heat sink and containment heat removal system (post-accident), and meteorological conditions related to the maximum evaporation and drift loss and minimum water cooling for the ultimate heat sink (UHS) design.

This Congressional directive will be implemented in two phases as follows:

- Phase 1: Issue generic 50.54(f) letters to all licensees to reevaluate the external hazards at their sites against present-day regulatory guidance and methodologies used for ESP and COL reviews.

- Phase 2: If necessary, and based upon the results of Phase 1, determine whether additional regulatory actions are necessary (e.g., update the design basis and SSCs important to safety) to protect against the updated hazards.

This information request addresses the Phase 1; the Phase 2 will be conducted after receiving responses to this request.

The scope of the requested information includes the reactor at full power operation and the spent fuel pool for all modes of operation. The evaluation of the spent fuel pool should consider each of the various operating configurations of the pool (e.g., full power reactor operations, refueling outage). Evaluation of ISFSI, if present at the site, is not considered within the scope at this time. The evaluation of potential loss of ultimate heat sink from the external hazards is included in the scope.

The first stage of the information requested is related to the hazard evaluation using the current (present day) NRC requirements and guidance. Because of the experiences gained by both the NRC and the industry in preparing and reviewing applications of several ESPs and COLs, the

technical approaches are well understood. It is anticipated that some interactions will be required with the industry to reach agreements on implementing the present day requirements for the operating plants. The time frame outlined under the requested responses takes this into account. The detailed steps to develop the hazard information are discussed under the requested actions.

The second stage of the information is related to the identification of actions that will be taken or planned to be taken to address plant-specific vulnerabilities[1] associated with the reevaluation of the hazard.

REQUESTED ACTIONS

Addressees are being requested to identify the site characteristics that serve as the existing design basis for natural external hazards (other than seismic and flooding) that can occur at their site. A list of example site characteristics for external hazards (other than seismic and flooding) that can adversely impact a facility is provided in Table 1. The list of site characteristics provide in Table 1 of this document was primarily derived from the list of example ESP and COL site characteristics provided in Table 1 of Appendix A to SRP 2.0.

Not all of the phenomena listed in Table 1 have corresponding site characteristic values that serve as a design basis (e.g., thunderstorms, lightning, hail, sand and dust storms, water spouts, forest and grass fires, volcanic activity). For these phenomena, the addressees should discuss the frequency of occurrence at their site and the measures taken to ensure the plant is protected against the adverse effects of the phenomena. The addressees should also identify any other natural phenomena not listed in Table 1 which can occur at their site for which protective measures have been implemented.

Addressees are also being requested to identify a new set of site of site characteristic values for their site using present day NRC guidance. Also included in Table 1 are references to the guidance documents describing NRC accepted methodologies for deriving each of the new site characteristic values. Recently approved ESP and COL applications also contain examples of recently accepted approaches for developing site characteristic values.

For those site characteristics related to meteorological phenomena, the associated site characteristic values should be based on climatological data that have been updated to include recent observations.

The design bases for some SSCs are intended to be based on ambient temperatures that will never be exceeded. In these situations, GDC 2 states that the design bases for SSCs important to safety shall reflect appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated. In order to be compliant with GDC 2, the ambient design temperature site

[1] A definition of vulnerability in the context of this enclosure is as follows: Plant-specific vulnerabilities are those features that when subject to **the increased demand due to a new hazard evaluation** are degraded or unable to perform their intended functions, which may also lead to compromising the overall ability to provide protection or mitigation.

characteristics should be based on the higher of either historic or 100-year return period values. Temperatures based on a 100-year return period are considered to provide sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated as required by the regulation.

A set of site characteristic values not in SRP 2.0 related to the design basis hurricane was added to Table 1 due to the recent publication of RG 1.221 in October 2011. RG 1.221 is intended to present hurricane loads that represent an extreme environmental load that is credible but highly improbable, similar to that of a design basis tornado which has an exceedance frequency of 10^{-7} per year. For those sites along the Gulf and Atlantic coasts where the design basis tornado may not bound the design basis hurricane, addressees are expected to show that their applicable structures can withstand, independently, the total design basis tornado load and the total design basis hurricane load as extreme environmental conditions.

In addition, each addressee is being requested to determine whether the new set of site characteristic values are bounded by the existing plant design basis. With regards to wind loads, present day NRC criteria for determining wind loads should be used to ascertain whether the new wind speed site characteristic values result in higher loads than previously analyzed. For those sites located near the Gulf or Atlantic coasts, determine whether the wind and missile loads that would be experienced during the design basis hurricane described in RG 1.221 would be bounded under the loading analysis for tornadoes.

If the new set of site characteristic values for external hazards are not bounded by the existing plant design basis, the addressees are being requested to evaluate the impact on applicable protection and mitigation features in order to identify plant vulnerabilities.

If the new set of site characteristic values for the external hazards listed in Table 1 are not bounded by the existing plant design basis, each addressee is being asked to evaluate the impact on the affected protection and mitigation features and determine whether they can continue to perform their intended functions. If the intended functions cannot be maintained, the addressee should describe what corrective actions or compensatory measures will be taken.

In developing the new site characteristic values for meteorological hazards, the applicability of these data to represent site conditions during the expected period of reactor operation should be substantiated. Any historical meteorological data used to characterize a site should extend over a significant time interval to capture cyclical extremes. Current literature on possible changes in the weather in the site region should also be reviewed to be confident that the methods used to predict weather extremes are reasonable.

REQUESTED INFORMATION

The NRC requests that each addressee provide the information in the steps listed below for each of its licensed NPP facilities. A flow chart of the requested information is provided in Figure 1.

1. Identify the site characteristics that serve as the existing design basis for the external hazards listed in Table 1. Generate a summary of the methodology used to develop

each of the existing design bases. Create a list of the SSCs and other measures that make use of this information and the corresponding FSAR sections and documents where the SSCs and other measures are discussed.

2. Identify a new set of site characteristic values for the external hazards listed in Table 1 using present day NRC guidance. Generate a summary of the methodology used to develop each of the new site characteristic values.

3. For each external hazard listed in Table 1, compare the new set of site characteristic values against the existing plant design bases.

4. Using the comparison performed in Step 3, determine whether the new set of site characteristic values for the external hazards listed in Table 1 are bounded by the existing plant design bases. Create a summary of the methodology, including the walkdown process, used to determine whether the new set of site characteristic values are bounded by the existing plant design basis. If it is determined that all the new site characteristic values are bounded by the existing plant design basis, proceed to Step 5. Otherwise, proceed to Step 6.

5. Submit a report containing the hazard evaluation results that show that all the new site characteristic values are bounded by the existing plant design basis. Include in this report the information requested in Steps 1 through 4.[2]

6. Submit a report containing the hazard evaluation results that show the new site characteristic values that are bounded and that are not bounded by the existing plant design basis. Include in this report the information requested in Steps 1 through 4.

7. For those new site characteristic values that are not bounded by the existing plant design basis, evaluate the impact on applicable protection and mitigation features. Create a summary of the methodology used to evaluate the impact on applicable protection and mitigation features.

8. Using the information developed in Step 7, determine whether all the affected protection and mitigation features can continue to perform their intended functions. Create a summary of the methodology used to determine whether all affected protection and mitigation features can continue to perform their intended functions. If it is determined that all the affected protection mitigation features can continue to perform their intended functions, proceed to Step 10. Otherwise, proceed to Step 9.

9. If any of the affected protection and mitigation features cannot continue to perform their intended functions (Step 8), determine what corrective actions or compensatory measures are necessary. Create a summary of the methodology used to determine what corrective actions or compensatory measures are necessary.

[2] No further action beyond submitting this report is required. Step 5 demonstrates termination of the process for resolution of NTTF Recommendation 2.1 as amended by the Appropriations Act for 2012.

10. Submit a report describing how affected features will be able to perform their intended functions and any corrective actions and compensatory measures that will be necessary. Include in this report the information requested in Steps 7 through 9.

The information provided in Step 10 will be evaluated in Phase 2 to consider any additional regulatory actions.

REQUIRED RESPONSE

In accordance with 10 CFR 50.54(f), an addressee must respond as described below:

- Within XXX (e.g. 180) days of the date of this information request, each addressee is requested to submit a description of the processes that will be used to (1) evaluate the impact on applicable protection and mitigation features if new site characteristic values that are not bounded by the existing plant design basis (Step 7) and (2) determine what corrective actions or compensatory measures will be necessary if any of the affected protection and mitigation features cannot continue to perform their intended functions (Step 9). As needed, this time period will allow sufficient time for interactions with the NRC staff and other stakeholders in development of the processes to assure that there is agreement on the processes to be used and the needed guidance is developed.

- Within X (e.g. one) year of the date of this information request, each addressee is requested to submit a written response consistent with the reports outlined in Steps 5 and 6 above. If needed, each addressee is also requested to indicate their plans to submitting the report requested in Step 10 above.

- If applicable, within X (e.g. two) years of the date of this information request, each addressee is requested to submit a written response consistent with the report outlined in Step 10 above.

If an addressee cannot meet the requested response date, the addressee must provide a response within 90 days of the date of this information request and describe the alternative course of action that it proposes to take, including the basis of the acceptability of the proposed alternative course of action and estimated completion dates.

The required written response should be addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, 11555 Rockville Pike, Rockville, MD 20852, under oath or affirmation under the provisions of Sections 161.c, 103.b, and 182.a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). In addition, addressees should submit a copy of the response to the appropriate Regional Administrator.

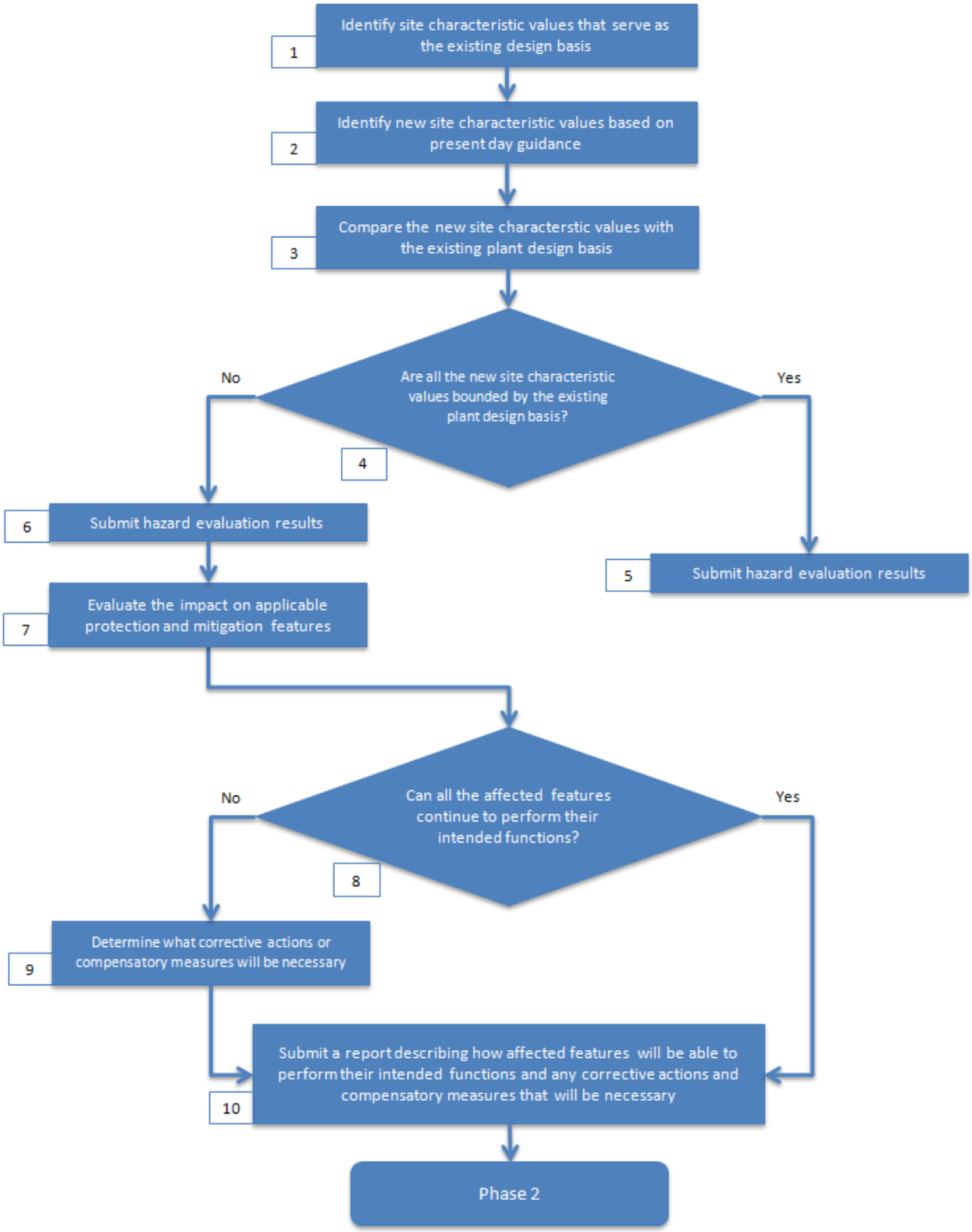
Table 1

Site Characteristics for Natural External Hazards (Other Than Seismic and Flooding)

Phenomena	Present-Day Design Basis Criteria
Design Basis Tornado • Maximum wind speed • Maximum pressure drop • Rate of pressure drop • Missile spectra	SRP 2.3.1, 3.3.2, and 3.5.1.4; RG 1.76 (Rev. 1)
Design Basis Hurricane • Maximum wind speed • Missile spectra	SRP 3.3.2, and 3.5.1.4; RG 1.221 • If the site-specific hurricane wind speed equals or exceeds 140 mi/h (63 m/s), the licensee should add the design basis hurricane to its list of new site characteristic values
Severe Wind • 100-year Wind Speed	SRP 2.3.1 and 3.3.1
Precipitation (for Roof Design) • Maximum rainfall rate • Maximum ground snow load for normal winter precipitation event • Maximum ground snow load for extreme winter precipitation event	SRP 2.3.1 and 2.4.2; DC/COL-ISG-7 • The maximum ground snow load for extreme winter precipitation event should include the contribution from the normal winter precipitation event
Ambient Design Temperatures • Dry-bulb temperature and coincident wet-bulb temperature 2% annual exceedance 1% annual exceedance 100-year maximum • Dry-bulb temperature 98% annual exceedance 99% annual exceedance 100-year minimum • Wet-bulb Temperature 2% annual exceedance 1% annual exceedance 100-year maximum	SRP 2.3.1, 5.4.7, 6.2.1, 6.2.2, 6.4, 9.1.3, and 9.2.2, • These are examples of site characteristic values use in establishing heat loads for the design of plant heat sink systems (exclusive of the ultimate heat sink) and plant heating, ventilation, and air conditioning (HVAC) systems. Provide only those site characteristic values that have been used in the design of SSCs important to safety. • Temperatures based on a 100-year return period are intended to represent 0% exceedance values (i.e., values that have a low probability of being exceeded during the lifetime of plant operation) and are considered to provide sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated in accordance with GDC 2.
Ultimate Heat Sink Design Basis • Conditions Resulting in the Maximum Evaporation and Drift Loss of Water During Any Consecutive 30 Days • Conditions Resulting in the Minimum Water Cooling During Any 1 Day During Any Consecutive 5 Days • Potential for Water Freezing in the UHS Water Storage Facility Potential Frazil and Anchor Ice Maximum Ice Thickness Maximum Cumulative Degree-Days Below Freezing	SRP 2.3.1, 2.4.7, and 9.2.5; RG 1.27 (Rev. 2) • The meteorological conditions resulting in maximum evaporation and minimum water cooling should be identified based on the worst combination of controlling parameters for the critical time periods unique to the specific design of the UHS as discussed in RG 1.27.The meteorological phenomena listed here are examples of site characteristic values typically used in evaluating mechanical draft cooling tower UHS.
Identify other phenomena that have been deemed to be significant for a particular site, such as thunderstorms, lightning, hail, sand and dust	SRP 2.2.1-2.2.2, 2.2.3 and 2.3.1; RG 1.204

storms, water spouts, forest and grass fires, and volcanic activity	

Figure 1
Development of Requested Information and Its Use in Regulatory Analysis


1
Identify site characteristic values that serve as the existing design basis
2
Identify new site characteristic values based on present day guidance
3
Compare the new site characterstic values with the existing plant design basis
4
Are all the new site characteristic values bounded by the existing plant design basis?
No
Yes
6
Submit hazard evaluation results
5
Submit hazard evaluation results
7
Evaluate the impact on applicable protection and mitigation features
8
Can all the affected features continue to perform their intended functions?
No
Yes
9
Determine what corrective actions or compensatory measures will be necessary
10
Submit a report describing how affected features will be able to perform their intended functions and any corrective actions and compensatory measures that will be necessary
Phase 2

Enclosure 3 Reference List

10 CFR 50.54(f) – "Conditions of Licenses."

Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-term Task Force Review of Insights from the Fukushima Dai-ichi Accident, ML111861807, DATE.

SECY 11-0093, "Near-Term Report and Recommendation for Agency Actions Following Events in Japan," ML11186A950, July 12, 2011.

SECY 11-0124, "Recommended Actions to be taken without Delay from the Near-Term Task Force Report," ML11245A158, dated September 9, 2011.

SRM SECY 11-0124, "Recommended Action to be taken without Delay from the Near-Term Task Force Report," ML112911571, dated October 18, 2011.

SRM SECY 11-0137, "Prioritization of Recommended Actions to Be Taken in Response to Fukushima Lessons Learned," ML113490055, dated December 15, 2011.

SRM SECY 11-0093, "Near-Term Report and Recommendation for Agency Actions Following Events in Japan," ML112310021, dated August 19, 2011.

Energy and Water Development and Related Agencies Appropriations Act, 2012

Supplement 4 to GL 88-20, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities," ML031150485, June 28, 1991.

NUREG-1742, "Perspectives Gained from the Individual Plant Examination of External Events (IPEEE) Program," ML021270070 and ML021270674, issued April 2002.

NUREG-1407, "Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities," ML063550238, DATE.

"Standard Review Plan [SRP] for the Review of Safety Analysis Reports for Nuclear Power Plants LWR Edition," September 1975.

General Design Criterion (GDC) 2, "Design Bases for Protection Against Natural Phenomena," in Appendix A to Title 10 of the *Code of Federal Regulations,* Part 50 (10 CFR Part 50)

General Design Criteria for Nuclear Power Plants, GDC 4, "Environmental and Dynamic Effects Design Bases," of Appendix A to 10 CFR Part 50

General Design Criteria for Nuclear Power Plants, GDC 44, "Cooling Water," of Appendix A to 10 CFR Part 50

Subpart B to 10 CFR Part 100

(§ 100.20(c)(2)

(§ 100.21(d)).

Table 1 of Appendix A to SRP Section 2.0, “Site Characteristics and Site Parameters,” ML070400364, March 2007

RG 1.221, “Design-Basis Hurricane and Hurricane Missiles for Nuclear Power Plants,” ML110940300, October 2011.

RG 1.76, “Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants,” ML003740273, March 2007.

DC/COL-ISG-7, Interim Staff Guidance on Assessment of Normal and Extreme Winter Precipitation Loads on the Roof s of Seismic Category I Structures,” ML091490556, July 2009.

RG 1.27, “Ultimate Heat Sink for Nuclear Power Plants,” Revision 2, ML113739969, January 1976.

RG 1.204, “Guidelines for Lightning Protection of Nuclear Power Plants,” ML052290422, November 2005.

NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition,” SRP Section:

2.3.1, “Regional Climatology,” ML063600393, March 2007.

3.3.2, Tornado Loadings, ML070570002, March 2007.

3.5.1.4, Missiles Generated by Tornados and Extreme Winds, ML070380174, March 2007.

3.3.1, Wind Loadings, ML070570001, March 2007.

5.4.7, Residual Heat Removal (RHR) System, ML100680577, May 2010.

6.2.1, Containment Functional Design, ML070220505, March 2007.

6.2.2, Containment Heat Removal Systems, ML070160661, March 2007.

6.4, Control Room Habitability System, ML070550069, March 2007.

9.1.3, Spent Fuel Pool Cooling and Cleanup Systems, ML063190013, March 2007.

9.2.2, Reactor Auxiliary Cooling Water Systems, ML070550053, March 2007.

2.4.2, Floods, ML070100647, March 2007.

2.4.7, Ice Effects, ML070100648, March 2007.

9.2.5, Ultimate Heat Sink, ML070550048, March 2007.

2.2.1-2.2.2, Identification of Potential Hazards in Site Vicinity, ML070460330, March 2007

2.2.3, Evaluation of Potential Accidents, ML070460336, March 2007.