KHNPDCDRAIsPEm Resource

From: Ciocco, Jeff
Sent: Monday, February 08, 2016 7:29 AM
To: apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; Harry (Hyun Seung) Chang; Andy Jiyong Oh; James Ross
Cc: Ashley, Clinton; Segala, John; Steckel, James; Lee, Samuel
Subject: APR1400 Design Certification Application RAI 41-8402 (19.03 Beyond Design Basis External Event (APR1400))
Attachments: APR1400 DC RAI 401 SCVB 8402.pdf

KHNP,

The attachment contains the subject request for additional information (RAI). This RAI was sent to you in draft form. Your licensing review schedule assumes technically correct and complete responses within 30 days of receipt of RAIs. However, KHNP requests, and we grant, the following RAI question response times. We may adjust the schedule accordingly.

19.03 Beyond Design Basis External Event (APR1400)-14: 45 days
19.03 Beyond Design Basis External Event (APR1400)-15: 45 days
19.03 Beyond Design Basis External Event (APR1400)-16: 60 days
19.03 Beyond Design Basis External Event (APR1400)-17: 45 days
19.03 Beyond Design Basis External Event (APR1400)-18: 45 days
19.03 Beyond Design Basis External Event (APR1400)-19: 45 days
19.03 Beyond Design Basis External Event (APR1400)-20: 45 days
19.03 Beyond Design Basis External Event (APR1400)-21: 45 days
19.03 Beyond Design Basis External Event (APR1400)-22: 60 days
19.03 Beyond Design Basis External Event (APR1400)-23: 45 days

Please submit your RAI response to the NRC Document Control Desk.

Thank you,

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United States Nuclear Regulatory Commission
Protecting People and the Environment

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REQUEST FOR ADDITIONAL INFORMATION 401-8402

Issue Date: 02/08/2016
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 19.03 Beyond Design Basis External Event (APR1400)
Application Section: 19.3 - Fukushima

QUESTIONS

19.03 Beyond Design Basis External Event (APR1400)-14

NRC Commission paper SECY-12-0025 (February 17, 2012), "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Tsunami," stated that the NRC staff expected new reactor design certification or license applications (e.g., construction permit, operating license, and combined license) not yet then-submitted to address the Commission-approved Fukushima actions in their applications, prior to submittal, to the fullest extent practicable. In SECY-12-0025, the NRC staff outlined a three-phase approach regarding mitigation strategies to respond to beyond-design-basis external events (BDBEEs). The initial phase involved the use of installed equipment and resources to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling without alternating current power. The transition phase involved providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from offsite. The final phase involved obtaining sufficient offsite resources to sustain those functions indefinitely.

The NRC staff provided guidance for satisfying the Commission directives regarding BDBEE mitigation strategies in Japan Lesson-Learned Project Directorate (JLD)-ISG-2012-01, Revision 0, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," (ADAMS Accession No. ML12229A174). JLD-ISG-2012-01 endorsed with clarification the methodologies described in the industry guidance document Nuclear Energy Institute (NEI) 12–06, Revision 0, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," (ADAMS Accession No. ML12242A378). The guidance in JLD-ISG-2012-01 describes one acceptable approach for satisfying the Commission directives regarding BDBEE mitigation strategies.

NEI 12-06 Section 3.2.1.5, "Reactor Coolant Inventory Loss," identifies that normal system leakage is a source of expected reactor coolant inventory loss. Technical Report APR1400-E-P-NR-14005-P, Table 5-9, "Conformance with NEI 12-06, Rev 0," indicates conformance with NEI 12-06 Section 3.2.1.5. However, the Technical Report does not identify if normal reactor coolant inventory loss (Technical Specifications typically permit up to 11 gpm) is considered as contributing to the mass and energy input into the containment. Therefore, the staff requests that the applicant assess all potential sources into the containment to include normal system leakage and evaluate the impact on containment capabilities.

19.03 Beyond Design Basis External Event (APR1400)-15

NRC Commission paper SECY-12-0025 (February 17, 2012), "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Tsunami," stated that the NRC staff expected new reactor design certification or license applications (e.g., construction permit, operating license, and combined license) not yet then-submitted to address the Commission-approved Fukushima actions in their applications, prior to submittal, to the fullest extent practicable. In SECY-12-0025, the NRC staff outlined a three-phase approach regarding mitigation strategies to respond to beyond-design-basis external events (BDBEEs). The initial phase involved the use of installed equipment and resources to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling without alternating current power. The transition phase involved providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from offsite. The final phase involved obtaining sufficient offsite resources to sustain those functions indefinitely.

The NRC staff provided guidance for satisfying the Commission directives regarding BDBEE mitigation strategies in Japan Lesson-Learned Project Directorate (JLD)-ISG-2012-01, Revision 0, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," (ADAMS Accession No. ML12229A174). JLD-ISG-2012-01 endorsed with clarification the methodologies described in the industry guidance document Nuclear Energy Institute (NEI) 12–06, Revision 0, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," (ADAMS Accession No. ML12242A378). The guidance in JLD-ISG-2012-01 describes one acceptable approach for satisfying the Commission directives regarding BDBEE mitigation strategies.

The staff conducted an Audit of Calculation 1-310-N380-008 Revision 0, "Containment Integrity Analysis Following RCP Seal Failure and Loss of RHR." This calculation discusses a single heat source, corresponding to a mass source, into containment from reactor coolant leakage flow (from reactor coolant pump seals). The staff requests that the applicant describe how sensible heat transfer from the reactor coolant system was evaluated. As part of the response, provide the value selected for sensible heat and any assumptions.

19.03 Beyond Design Basis External Event (APR1400)-16

NRC Commission paper SECY-12-0025 (February 17, 2012), "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Tsunami," stated that the NRC staff expected new reactor design certification or license applications (e.g., construction permit, operating license, and combined license) not yet then-submitted to address the Commission-approved Fukushima actions in their applications, prior to submittal, to the fullest extent practicable. In SECY-12-0025, the NRC staff outlined a three-phase approach regarding mitigation strategies to respond to beyond-design-basis external events (BDBEEs). The initial phase involved the use of installed equipment and resources to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling without alternating current power. The transition phase involved providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from offsite. The final phase involved obtaining sufficient offsite resources to sustain those functions indefinitely.

The NRC staff provided guidance for satisfying the Commission directives regarding BDBEE mitigation strategies in Japan Lesson-Learned Project Directorate (JLD)-ISG-2012-01, Revision

0, “Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,” (ADAMS Accession No. ML12229A174). JLD-ISG-2012-01 endorsed with clarification the methodologies described in the industry guidance document Nuclear Energy Institute (NEI) 12–06, Revision 0, “Diverse and Flexible Coping Strategies (FLEX) Implementation Guide,” (ADAMS Accession No. ML12242A378). The guidance in JLD-ISG-2012-01 describes one acceptable approach for satisfying the Commission directives regarding BDBEE mitigation strategies.

APR1400 DCD, Tier 2, Section 19.3.2.3.3 describes use of the ultimate pressure capacity (UPC) as the acceptance criterion for assessing the APR1400 containment capabilities when steam generators (SG’s) are not available (mid-loop operation). The staff requests that the applicant provide justification that the selected acceptance criterion (i.e., UPC value of 184 psia) is appropriate to ensure containment capabilities during a beyond-design-basis external event. As part of the response,

1. Discuss how the selected acceptance criterion (i.e., UPC) accounts for uncertainty and margin to ensure containment capabilities.

2. Discuss the reasoning for selecting the design basis UPC limit provided in DCD Tier 2, Chapter 3.8, “Design of Category I Structures,” versus the UPC limits expressed in DCD Tier 2, Sections 19.1, “Probabilistic Risk Assessment,” or 19.2, “Severe Accident.”

3. Discuss how the containment UPC limit (12.9 kg/cm2 or 184 psia) is determined and describe temperature assumptions associated with this determination.

4. Evaluate if the predicted temperature in containment (185 ºC or 365 ºF) is bounded by the temperature at which the UPC limit (12.9 kg/cm2 or 184 psia) was determined.

5. Provide the basis for why the containment temperature criterion of 185 ºC (365 ºF) (temperature associated with maintaining containment at the UPC limit) is acceptable to ensure containment capabilities are maintained.

6. Provide justification that the instrumentation (e.g., pressure, temperature, level) credited with assisting the operators to maintain containment capabilities are qualified to function and provide reliable indication to the operator when exposed to these acceptance criteria. In addition, the staff requests that the applicant document the alarms, indications, and associated instrumentation that will direct the operator to initiate the emergency containment spray backup system (ECSBS).

7. Discuss how the uncertainty in the containment pressure displayed to the operator is considered in the analysis that provides the basis for operator actions to run the ECSBS in order to prevent the UPC limit from being exceeded.

8. Address if the containment configuration during lower modes could result in a lower or adjusted UPC when compared with power operation (Mode 1). If a lower or adjusted UPC is appropriate, discuss the impact on the mitigation strategy.

9. Given that EA 12-049 states, “Licensees or CP holders must provide reasonable protection for the associated equipment from external events,” the staff requests that the applicant justify plans to operate the ECSBS intermittently upon reaching the UPC limit, and not well before the UPC limit, to maintain the containment function.

19.03 Beyond Design Basis External Event (APR1400)-17

NRC Commission paper SECY-12-0025 (February 17, 2012), “Proposed Orders and Requests for Information in Response to Lessons Learned from Japan’s March 11, 2011, Great Tohoku Earthquake and Tsunami,” stated that the NRC staff expected new reactor design certification or license applications (e.g., construction permit, operating license, and combined license) not yet then-submitted to address the Commission-approved Fukushima actions in their applications, prior to submittal, to the fullest extent practicable. In SECY-12-0025, the NRC staff outlined a three-phase approach regarding mitigation strategies to respond to beyond-design-basis external events (BDBEEs). The initial phase involved the use of installed equipment and resources to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling without alternating current power. The transition phase involved providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from offsite. The final phase involved obtaining sufficient offsite resources to sustain those functions indefinitely.

The NRC staff provided guidance for satisfying the Commission directives regarding BDBEE mitigation strategies in Japan Lesson-Learned Project Directorate (JLD)-ISG-2012-01, Revision 0, “Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,” (ADAMS Accession No. ML12229A174). JLD-ISG-2012-01 endorsed with clarification the methodologies described in the industry guidance document Nuclear Energy Institute (NEI) 12–06, Revision 0, “Diverse and Flexible Coping Strategies (FLEX) Implementation Guide,” (ADAMS Accession No. ML12242A378). The guidance in JLD-ISG-2012-01 describes one acceptable approach for satisfying the Commission directives regarding BDBEE mitigation strategies.

Technical Report APR1400-E-P-NR-14005-P Section 5.1.2.5.3 provides performance requirements for portable equipment that sprays water (via emergency containment spray backup system (ECSBS)) into containment at 2,839 L/min (750 gpm) and a differential pressure of at least 2.8 kg/cm2 (40 psi). The ECSBS is assumed to operate intermittently for 2 hours whenever the containment pressure reaches the UPC value. The staff requests that the applicant provide the basis for selecting 40 psi as the minimum differential pressure performance requirement. Also, discuss the rationale for selecting intermittent spray operation versus continuous spray operation to maintain containment capabilities.

19.03 Beyond Design Basis External Event (APR1400)-18

NRC Commission paper SECY-12-0025 (February 17, 2012), “Proposed Orders and Requests for Information in Response to Lessons Learned from Japan’s March 11, 2011, Great Tohoku Earthquake and Tsunami,” stated that the NRC staff expected new reactor design certification

or license applications (e.g., construction permit, operating license, and combined license) not yet then-submitted to address the Commission-approved Fukushima actions in their applications, prior to submittal, to the fullest extent practicable. In SECY-12-0025, the NRC staff outlined a three-phase approach regarding mitigation strategies to respond to beyond-design-basis external events (BDBEEs). The initial phase involved the use of installed equipment and resources to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling without alternating current power. The transition phase involved providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from offsite. The final phase involved obtaining sufficient offsite resources to sustain those functions indefinitely.

The NRC staff provided guidance for satisfying the Commission directives regarding BDBEE mitigation strategies in Japan Lesson-Learned Project Directorate (JLD)-ISG-2012-01, Revision 0, “Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,” (ADAMS Accession No. ML12229A174). JLD-ISG-2012-01 endorsed with clarification the methodologies described in the industry guidance document Nuclear Energy Institute (NEI) 12–06, Revision 0, “Diverse and Flexible Coping Strategies (FLEX) Implementation Guide,” (ADAMS Accession No. ML12242A378). The guidance in JLD-ISG-2012-01 describes one acceptable approach for satisfying the Commission directives regarding BDBEE mitigation strategies.

Technical Report APR1400-E-P-NR-14005-P does not contain simplified drawings to show how the FLEX strategy, using the emergency containment spray backup system (ECSBS), is used to maintain containment capabilities. The staff requests that the applicant provide a simplified drawing(s) that identifies the flow path to deliver water to containment. For example the drawing should depict plant piping, valves, pumps, water sources, power needs (as applicable), and any associated connections (FLEX pump suction, FLEX pump discharge, and fuel supply) and support systems. The staff also requests that the applicant provide the quality classification of installed structures, systems, and components used to maintain containment capabilities. Additionally, the location for any connections should be identified.

19.03 Beyond Design Basis External Event (APR1400)-19

NRC Commission paper SECY-12-0025 (February 17, 2012), “Proposed Orders and Requests for Information in Response to Lessons Learned from Japan’s March 11, 2011, Great Tohoku Earthquake and Tsunami,” stated that the NRC staff expected new reactor design certification or license applications (e.g., construction permit, operating license, and combined license) not yet then-submitted to address the Commission-approved Fukushima actions in their applications, prior to submittal, to the fullest extent practicable. In SECY-12-0025, the NRC staff outlined a three-phase approach regarding mitigation strategies to respond to beyond-design-basis external events (BDBEEs). The initial phase involved the use of installed equipment and resources to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling without alternating current power. The transition phase involved providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from offsite. The final phase involved obtaining sufficient offsite resources to sustain those functions indefinitely.

The NRC staff provided guidance for satisfying the Commission directives regarding BDBEE mitigation strategies in Japan Lesson-Learned Project Directorate (JLD)-ISG-2012-01, Revision

0, “Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,” (ADAMS Accession No. ML12229A174). JLD-ISG-2012-01 endorsed with clarification the methodologies described in the industry guidance document Nuclear Energy Institute (NEI) 12–06, Revision 0, “Diverse and Flexible Coping Strategies (FLEX) Implementation Guide,” (ADAMS Accession No. ML12242A378). The guidance in JLD-ISG-2012-01 describes one acceptable approach for satisfying the Commission directives regarding BDBEE mitigation strategies.

Technical Report APR1400-E-P-NR-14005-P does not describe the connection points (for FLEX equipment) necessary to maintain the containment capabilities. NEI 12-06 Section 3.2.1.3, “Initial Conditions,” indicates that permanent plant equipment that is contained in structures with designs that are robust with respect to seismic events, floods, and high winds, and associated missiles, are available. The report should provide connection design information that justifies that a connection is robust and remains available to address a beyond-design-basis external event. The staff requests that the applicant provide information in the Technical Report that describes the connection design and connection quality classification used to maintain the containment capabilities and provide a basis for assuming that the connections will be available.

19.03 Beyond Design Basis External Event (APR1400)-20

NRC Commission paper SECY-12-0025 (February 17, 2012), “Proposed Orders and Requests for Information in Response to Lessons Learned from Japan’s March 11, 2011, Great Tohoku Earthquake and Tsunami,” stated that the NRC staff expected new reactor design certification or license applications (e.g., construction permit, operating license, and combined license) not yet then-submitted to address the Commission-approved Fukushima actions in their applications, prior to submittal, to the fullest extent practicable. In SECY-12-0025, the NRC staff outlined a three-phase approach regarding mitigation strategies to respond to beyond-design-basis external events (BDBEEs). The initial phase involved the use of installed equipment and resources to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling without alternating current power. The transition phase involved providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from offsite. The final phase involved obtaining sufficient offsite resources to sustain those functions indefinitely.

The NRC staff provided guidance for satisfying the Commission directives regarding BDBEE mitigation strategies in Japan Lesson-Learned Project Directorate (JLD)-ISG-2012-01, Revision 0, “Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,” (ADAMS Accession No. ML12229A174). JLD-ISG-2012-01 endorsed with clarification the methodologies described in the industry guidance document Nuclear Energy Institute (NEI) 12–06, Revision 0, “Diverse and Flexible Coping Strategies (FLEX) Implementation Guide,” (ADAMS Accession No. ML12242A378). The guidance in JLD-ISG-2012-01 describes one acceptable approach for satisfying the Commission directives regarding BDBEE mitigation strategies.

NEI 12-06 Section 3.2.1.9, “Personal Accessibility,” states that areas requiring personnel access should be evaluated to ensure the conditions will support the actions required by the plant-specific strategy for responding to the event. Technical Report APR1400-E-P-NR-14005-P, Table 5-9, “Conformance with NEI 12-06, Rev. 0,” indicates conformance to NEI 12-06 Section 3.2.1.9. The Technical Report does not describe plant areas requiring personnel access and

the actions needed to maintain or restore the containment capabilities. The staff requests that the applicant provide a listing of the areas requiring personnel access, the actions required (e.g., opening a valve, making a connection), and an evaluation of those areas to ensure the conditions will support the actions required by the plant-specific strategy for responding to the event. In addition, the staff requests that the applicant document the specific tasks required to initiate the emergency containment spray backup system (ECSBS) and the required time to establish ECSBS.

19.03 Beyond Design Basis External Event (APR1400)-21

NRC Commission paper SECY-12-0025 (February 17, 2012), "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Tsunami," stated that the NRC staff expected new reactor design certification or license applications (e.g., construction permit, operating license, and combined license) not yet then-submitted to address the Commission-approved Fukushima actions in their applications, prior to submittal, to the fullest extent practicable. In SECY-12-0025, the NRC staff outlined a three-phase approach regarding mitigation strategies to respond to beyond-design-basis external events (BDBEEs). The initial phase involved the use of installed equipment and resources to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling without alternating current power. The transition phase involved providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from offsite. The final phase involved obtaining sufficient offsite resources to sustain those functions indefinitely.

The NRC staff provided guidance for satisfying the Commission directives regarding BDBEE mitigation strategies in Japan Lesson-Learned Project Directorate (JLD)-ISG-2012-01, Revision 0, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," (ADAMS Accession No. ML12229A174). JLD-ISG-2012-01 endorsed with clarification the methodologies described in the industry guidance document Nuclear Energy Institute (NEI) 12–06, Revision 0, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," (ADAMS Accession No. ML12242A378). The guidance in JLD-ISG-2012-01 describes one acceptable approach for satisfying the Commission directives regarding BDBEE mitigation strategies.

Technical Report, APR1400-E-P-NR-14005-P, Table 6-1, "External Connection Components for BDBEE," lists diesel fuel oil supply line isolation valves that are not consistent with DCD, Tier 2, Figure 9.5.4-1, "Diesel Fuel Oil Transfer System Flow Diagram." For example, Technical Report Table 6-1 is missing V2208. The staff requests that the applicant address any inconsistencies between Technical Report Table 6-1 and DCD, Tier 2, Figure 9.5.4-1.

19.03 Beyond Design Basis External Event (APR1400)-22

NRC Commission paper SECY-12-0025 (February 17, 2012), "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Tsunami," stated that the NRC staff expected new reactor design certification or license applications (e.g., construction permit, operating license, and combined license) not

yet then-submitted to address the Commission-approved Fukushima actions in their applications, prior to submittal, to the fullest extent practicable. In SECY-12-0025, the NRC staff outlined a three-phase approach regarding mitigation strategies to respond to beyond-design-basis external events (BDBEEs). The initial phase involved the use of installed equipment and resources to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling without alternating current power. The transition phase involved providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from offsite. The final phase involved obtaining sufficient offsite resources to sustain those functions indefinitely.

The NRC staff provided guidance for satisfying the Commission directives regarding BDBEE mitigation strategies in Japan Lesson-Learned Project Directorate (JLD)-ISG-2012-01, Revision 0, “Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,” (ADAMS Accession No. ML12229A174). JLD-ISG-2012-01 endorsed with clarification the methodologies described in the industry guidance document Nuclear Energy Institute (NEI) 12–06, Revision 0, “Diverse and Flexible Coping Strategies (FLEX) Implementation Guide,” (ADAMS Accession No. ML12242A378). The guidance in JLD-ISG-2012-01 describes one acceptable approach for satisfying the Commission directives regarding BDBEE mitigation strategies.

Technical Report, APR1400-E-P-NR-14005-P, Section 5.1.2.5.3 credits the Raw Water Tank (RWT) as an on-site water source used to maintain containment capabilities. However, the RWT and its associated structures and systems (i.e., flow path) relied upon to deliver water to the suction of a FLEX pump are not described in the DCD or the Technical Report. The staff requests that the applicant provide appropriate information in the DCD on the design of the RWT water source and its associated flow path (structures, piping, components, and connections) to deliver water to support the containment mitigating strategy and assess if the RWT water source and its associated flow path to the suction of FLEX pump are robust with respect to seismic events, floods, high winds, and associated missiles.

19.03 Beyond Design Basis External Event (APR1400)-23

NRC Commission paper SECY-12-0025 (February 17, 2012), “Proposed Orders and Requests for Information in Response to Lessons Learned from Japan’s March 11, 2011, Great Tohoku Earthquake and Tsunami,” stated that the NRC staff expected new reactor design certification or license applications (e.g., construction permit, operating license, and combined license) not yet then-submitted to address the Commission-approved Fukushima actions in their applications, prior to submittal, to the fullest extent practicable. In SECY-12-0025, the NRC staff outlined a three-phase approach regarding mitigation strategies to respond to beyond-design-basis external events (BDBEEs). The initial phase involved the use of installed equipment and resources to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling without alternating current power. The transition phase involved providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from offsite. The final phase involved obtaining sufficient offsite resources to sustain those functions indefinitely.

The NRC staff provided guidance for satisfying the Commission directives regarding BDBEE mitigation strategies in Japan Lesson-Learned Project Directorate (JLD)-ISG-2012-01, Revision 0, “Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,” (ADAMS Accession No.

ML12229A174). JLD-ISG-2012-01 endorsed with clarification the methodologies described in the industry guidance document Nuclear Energy Institute (NEI) 12–06, Revision 0, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," (ADAMS Accession No. ML12242A378). The guidance in JLD-ISG-2012-01 describes one acceptable approach for satisfying the Commission directives regarding BDBEE mitigation strategies.

Technical Report, APR1400-E-P-NR-14005-P, Table 5-8, "Conformance with JLD-ISG-2012-01, Rev. 0," Section 5.0, "Containment Function Strategies," states that for those penetrations needed to be opened for FLEX strategies, that the isolation valves can be opened from the MCR [Main Control Room]. The staff requests that the applicant identify the valves that are to be opened, what support systems are needed to open the valves from the control room (e.g., electrical power, air, etc.), and why these supporting systems are available during the event (extended loss of ac power concurrent with a loss of the ultimate heat sink). In addition, for the containment penetration that is used to provide IRWST water to support the FLEX strategies (opening of motor operated valve 005 and 006 depicted in DCD Tier 2, Figure 6.8-3) the staff requests setpoint information on the penetration relief valve 1003, and the basis for the setpoint (assess the pressure seen by the relief valve during mitigating strategies and the relief valve setpoint).


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