



Ernest J. Kapopoulos, Jr.
H. B. Robinson Steam Electric Plant Unit 2
Site Vice President

Duke Energy
3581 West Entrance Road
Hartsville, SC 29550

o: 843.951.1701
f: 843.951.1319

Emie.Kapopoulos@duke-energy.com

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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

H. B. Robinson Steam Electric Plant, Unit No. 2
Docket Number 50-261
Renewed Facility Operating License No. DPR-23

Subject: Supplement to H.B. Robinson Steam Electric Plant, Unit No. 2, Seismic Probabilistic Risk Assessment (SPRA) Submittal – Site Actions

Reference: Duke Energy Letter, *H.B. Robinson Steam Electric Plant, Unit No. 2 – Seismic Probabilistic Risk Assessment (SPRA), Response to March 12, 2012, Request for Information Regarding Recommendation 2.1: Seismic, of the Near-Term Task Force Related to the Fukushima Dai-ichi Nuclear Power Plant Accident*, dated December 12, 2019

Ladies and Gentlemen:

In a letter dated December 12, 2019 (i.e., Reference), Duke Energy Progress, LLC (Duke Energy), provided the seismic probabilistic risk assessment (SPRA) associated with the seismic hazard reevaluation for H. B. Robinson Steam Electric Plant, Unit No. 2 (HBRSEP). The submittal included a discussion of a planned plant modification to provide additional protection from re-evaluated seismic hazards.

The purpose of this submittal is to provide supplemental information associated with the planned modification and describe other actions, completed or planned, to reduce seismic risk. The supplemental information, provided in Enclosure 1 to this letter, addresses mitigating strategies, training, procedure changes, interim measures, and plant modifications. The permanent plant modifications PM1 and PM4 in Enclosure 1 implement the planned action described in Table 6-1 in the referenced letter. Enclosure 2 contains the actions from Enclosure 1 to which HBRSEP has committed. HBRSEP will ensure that operator actions associated with the permanent plant modifications are validated in accordance with NEI 12-06, Appendix E, Revision 2, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide."

Please address any comments or questions regarding this matter to Mr. Art Zaremba, Director - Nuclear Fleet Licensing, at (980) 373-2062.

I declare, under penalty of perjury, that the foregoing is true and correct.

Executed on 19 JUNE, 2020.

Sincerely,



Ernest J. Kapopoulos, Jr.
Site Vice President

LJG/ljg

Enclosures:

1. H. B. Robinson SPRA Supplement, Site Actions
2. H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, Seismic Probabilistic Risk Assessment - Regulatory Commitments

cc: Ms. L. Dudes, USNRC Regional Administrator, Region II
Mr. M. Fannon, USNRC Sr. Resident Inspector - HBRSEP
Ms. T. Hood, USNRC NRR Project Manager - HBRSEP

Enclosure 1

H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2

H. B. Robinson SPRA Supplement
Site Actions

H. B. Robinson SPRA Supplement Site Actions

Action Description	Scheduled Completion Date	Risk Benefit in SCDF/SLERF (Approximate)
Mitigating Strategies [Note: MS1 through MS10 are Pre-Existing Strategies]		
<u>MS1: Mitigating Strategy – S/G Feedwater</u> Extreme Damage Mitigation Guideline EDMG-004, “Steam Generators (S/G),” provides guidance to inject alternate water supply into one or more depressurized S/G for core cooling. Alternate water supply is provided by EDMG-010, “Emergency Diesel Make-Up Pump (EDMP) Setup and Operation.”	Complete	High benefit action, with adequate water sources supplied within the one hour (approx.) time line. Sensitivity provides approximately 3.7E-5 and 6.1E-6 reductions for seismic core damage frequency (SCDF) and seismic large early release frequency (SLERF), respectively.
<u>MS2: Mitigating Strategy – Flooding Containment</u> Extreme Damage Mitigation Guideline EDMG-005, “Containment Vessel (CV),” provides guidance to inject alternate water supply into the CV. Alternate water supply is provided by EDMG-010, “Emergency Diesel Make-Up Pump (EDMP) Setup and Operation.”	Complete	Less than 5% SLERF reduction expected as the chance of scrubbing increases for non-bypass sequences.
<u>MS3: Mitigating Strategy – Alternate Water Supply</u> Extreme Damage Mitigation Guideline EDMG-010, “Emergency Diesel Make-Up Pump (EDMP) Setup and Operation,” provides guidance for accessing alternate makeup or spray water from the Refueling Water Storage Tank (RWST), Firewater System, FLEX Tanks, Lake Robinson, or the Discharge Canal, if available.	Complete	Facilitates post-event operator and emergency response organization (ERO) responses.

Action Description	Scheduled Completion Date	Risk Benefit in SCDF/SLERF (Approximate)
<p><u>MS4: Mitigating Strategy – RCS Makeup</u> Extreme Damage Mitigation Guideline EDMG-012, “Core Cooling Using Alternate Water Source,” provides guidance to inject alternate water supply into the depressurized Reactor Coolant System (RCS) for core cooling. Alternate water supply is provided by EDMG-010, “Emergency Diesel Make-Up Pump (EDMP) Setup and Operation.”</p>	<p>Complete</p>	<p>Defense in depth and a small risk reduction for slow progression accident sequences that require RCS makeup such as very small loss-of-coolant accident (VSLOCA). Less than 1% SCDF and SLERF reductions are expected.</p>
<p><u>MS5: Mitigating Strategy – RCS Boration</u> Extreme Damage Mitigation Guideline EDMG-014, “Alternate RCS Boration,” provides guidance to inject borated alternate water supply to the depressurized RCS. Alternate water supply is provided by the FLEX Fire Pump or EDMG-010, “Emergency Diesel Make-Up Pump (EDMP) Setup and Operation.”</p>	<p>Complete</p>	<p>Defense in depth for slow progression accident sequences that require RCS makeup such as VSLOCA. Less than 1% SCDF and SLERF reductions are expected.</p>
<p><u>MS6: Mitigating Strategy – RCS Makeup</u> Flex Support Guideline FSG-001, “Long Term RCS Inventory Control,” provides guidance to restore RCS inventory using a primary or alternate makeup water source. Alternate makeup sources include the RWST, Spent Fuel Pool (SFP), Lake Robinson, or the Discharge Canal.</p>	<p>Complete</p>	<p>Defense in depth for slow progression accident sequences that require RCS makeup such as VSLOCA. Less than 1% SCDF and SLERF reductions are expected.</p>
<p><u>MS7: Mitigating Strategy – S/G Feedwater</u> Flex Support Guideline FSG-003, “Alternate Feedwater,” provides guidance to inject alternate water supply into one or more S/G (pressurized or depressurized) for core cooling. Alternate water sources include the Condensate Storage Tank (CST), FLEX Tanks, Condensate Inlet Waterbox, Deepwell Pump D, Lake Robinson, or the Discharge Canal, if available.</p>	<p>Complete</p>	<p>High risk benefit action assuming the action can be implemented within one hour and there is a reliable water source. Sensitivity provides approximately 3.7E-5 and 6.1E-6 reductions for SCDF and SLERF, respectively.</p>

Action Description	Scheduled Completion Date	Risk Benefit in SCDF/SLERF (Approximate)
<p><u>MS8: Mitigating Strategy – Initial Assessment</u></p> <p>Flex Support Guideline FSG-005, “Initial Assessment and FLEX Equipment Staging,” provides guidance for the initial assessment of plant equipment and system status. The assessment of available water sources includes the RWST, CST, SFP, Service Water System, FLEX Tanks, Condensate Inlet Waterbox, Deepwell Pump D, Lake Robinson, and the Discharge Canal.</p>	Complete	This action is for the use of alternate water supplies to support MS1 and MS2 actions and the associated risk benefit.
<p><u>MS9: Mitigating Strategy – RCS Boration</u></p> <p>FLEX Support Guideline FSG-008, “Alternate RCS Boration,” provides guidance to inject borated water into the RCS. Alternate makeup sources include the RWST, Lake Robinson, or the Discharge Canal.</p>	Complete	Defense in depth for slow progression accident sequences that require RCS makeup such as VSLOCA. Less than 1% SCDF and SLERF reductions are expected.
<p><u>MS10: Mitigating Strategy – Cooling Containment</u></p> <p>FLEX Support Guideline FSG-012, “Alternate Containment Cooling,” provides guidance for cooling the CV using external water spray, internal water spray, or recirculating fan cooling. Alternate water sources include fire tankers from the local fire department, and fire water per EDMG-005.</p>	Complete	Defense in depth to reduce containment pressure for non-bypass accident sequences. Less than 5% SLERF reduction expected.
Procedures and Training		
<p><u>P1: Procedures - Mitigating Strategy Review</u></p> <p>Select Operations and ERO personnel to conduct a strategy review meeting (e.g., table top exercise) of relevant EDMG and FSG procedures, to identify additional enhancements for extreme seismic events.</p>	August 13, 2020	Improves success of operator and ERO responses.
<p><u>P2: Procedures - Revisions</u></p> <p>Following strategy review meeting detailed in action P1 above, update relevant EDMG and/or FSG procedures to provide additional guidance for potential loss of capability due to extreme seismic events.</p>	October 29, 2020	Improves success of operator and ERO responses.

Action Description	Scheduled Completion Date	Risk Benefit in SCDF/SLERF (Approximate)
<p><u>T1: Training</u> Provide training to Operations personnel on seismic probabilistic risk assessment (SPRA) results and plant impacts.</p>	Complete	Improves success of operator response.
<p><u>T2: Training</u> Provide training to ERO personnel on SPRA results and plant impacts.</p>	Complete	Improves success of mitigation strategies.
Plant Modifications		
<p><u>PM/I1: Plant Modification – Interim Measure</u> Hose will be pre-staged to connect Deepwell Pumps A, B and C to the suction of the existing FLEX Auxiliary Feedwater (AFW) pumps, or for use with other mitigation strategies. This interim measure will address the liquefaction failure mode of supply from Deepwell Pumps, A, B and C. This interim measure also provides alternate sources of cooling water to mitigate a postulated loss of the Ultimate Heat Sink (UHS). This interim measure will remain in place until implementation of the permanent plant modification to install sections of piping or hose is complete (i.e., permanent plant modification PM3).</p>	June 26, 2020	Defense in depth action and could be significant depending upon sequences of events with other systems and buildings which impact timing. Sensitivity provides approximately 3.7E-5 and 6.1E-6 reductions for SCDF and SLERF, respectively.
<p><u>PM/I2: Plant Modification – Interim Measure</u> Structural supports will be added to the existing tanks which supply cooling water to the FLEX AFW pumps. This interim measure will add structural supports to reduce the failure probability due to seismic uplift and overturning of the tanks. This interim measure will remain in place until installation of new Deepwell Pump E is complete (i.e., permanent plant modification PM4).</p>	August 27, 2020	Defense in depth with an immediate water source for the more frequent low to medium seismic events. Less than 5% SCDF and SLERF reductions are expected.

Action Description	Scheduled Completion Date	Risk Benefit in SCDF/SLERF (Approximate)
<p><u>PM/I3: Plant Modification – Interim Measure</u></p> <p>The existing pre-staged discharge hose from the FLEX AFW pumps will be reconfigured to include a branch which routes to the existing FLEX AFW connection (AFW-165) located inside the Motor-Driven AFW Pump Room. The current configuration connects to the FLEX AFW connection near the Steam-Driven AFW Pump (AFW-166). The new configuration will feature isolation of the two branches such that the branch which connects to AFW-165 will not be vulnerable to a potential failure of the Turbine Building Class III structure. Hose sections will be pre-staged near AFW-165 assembly post-event.</p> <p>This interim measure will remain in place until implementation of Plant Modification PM1 is complete.</p>	<p>September 30, 2020</p>	<p>High SCDF and SLERF impact, when combined with PM2, PM3, and PM4 (Deepwell Pump E) or if the existing deepwell pumps can be aligned with the FLEX AFW pump as an initial cooling water source. A sensitivity for the combined case of PM1 through PM4 provides approximately 5.6E-5 and 7.2E-6 reductions for SCDF and SLERF, respectively.</p>
<p><u>PM1: Plant Modification – Permanent</u></p> <p>The existing pre-staged discharge hose from the FLEX AFW pumps will be reconfigured to include a branch which routes to the existing FLEX AFW connection (AFW-165) located inside the Motor-Driven AFW Pump Room. The current configuration connects to the FLEX AFW connection near the Steam-Driven AFW Pump (AFW-166). The new configuration will feature isolation of the two branches such that the branch which connects to AFW-165 will not be vulnerable to a potential failure of the Turbine Building Class III structure.</p> <p>This modification provides an AFW flow path that is not vulnerable to seismic failure of the Turbine Building Class III structure, and adds redundancy to the current pre-staged FLEX AFW strategy.</p>	<p>July 30, 2021</p>	<p>High SCDF and SLERF impact, when combined with PM2, PM3, and PM4 (Deepwell Pump E) or if the existing deepwell pumps can be aligned with the FLEX AFW pump as an initial cooling water source. A sensitivity for the combined case of PM1 through PM4 provides approximately 5.6E-5 and 7.2E-6 reductions for SCDF and SLERF, respectively.</p>

Action Description	Scheduled Completion Date	Risk Benefit in SCDF/SLERF (Approximate)
<p><u>PM2: Plant Modification – Permanent</u></p> <p>For the existing Deepwell Pumps A, B and C, isolation valves, hose connections and pipe will be installed to protect the above ground portion of the piping from the seismic event.</p> <p>This modification will address the liquefaction failure mode of supply from Deepwell Pumps, A, B and C. This modification also provides alternate sources of cooling water to mitigate a postulated loss of the Ultimate Heat Sink (UHS).</p>	<p>May 29, 2021</p>	<p>Defense in depth as an alternate long-term cooling water source. A sensitivity for the combined case of PM1 through PM4 provides approximately 5.6E-5 and 7.2E-6 reductions for SCDF and SLERF, respectively.</p>
<p><u>PM3: Plant Modification – Permanent</u></p> <p>For the existing Deepwell Pumps A, B and C, hose and/or pipe will be routed from each pump to the suction header for the existing FLEX AFW pumps. The shortest and most seismically preferable routes will be utilized, as best possible. For high traffic areas, hose will be permanently staged in lieu of permanent installation. To mitigate probable damage, the routes will include sections to allow for easy disassembly and connection of new sections.</p> <p>This modification supplements permanent plant modification PM2 above, to provide alternate sources of cooling water to mitigate a postulated loss of UHS.</p>	<p>June 30, 2021</p>	<p>Defense in depth as an alternate long-term cooling water source. A sensitivity for the combined case of PM1 through PM4 provides approximately 5.6E-5 and 7.2E-6 reductions for SCDF and SLERF, respectively.</p>

Action Description	Scheduled Completion Date	Risk Benefit in SCDF/SLERF (Approximate)
<p><u>PM4: Plant Modification – Permanent</u></p> <p>Install a new Deepwell Pump E to provide suction directly to the existing FLEX AFW pumps. The construction of the new deepwell pump will include similar seismically rugged features as existing Deepwell Pump D. The new Deepwell Pump E and appurtenances will be located, or otherwise protected, to prevent adverse seismic impact from other structures or equipment. The new deepwell pump will be located and configured to support time sensitive operator actions per the guidance of NEI 12-06, Revision 2, “Diverse and Flexible Coping Strategies (FLEX) Implementation Guide.” Power for the new deepwell pump will be provided by normal AC power, and a new diesel generator, similar to existing Deepwell Pumps A, B and C.</p> <p>This modification will address the high failure probability of the existing tanks which provide suction to the FLEX AFW pumps. This modification also provides an alternate source of cooling water to mitigate a postulated loss of UHS.</p>	<p>December 31, 2021</p>	<p>High SCDF and SLERF improvement, when combined with PM1, PM2, and PM3. A sensitivity for the combined case of PM1 through PM4 provides approximately 5.6E-5 and 7.2E-6 reductions for SCDF and SLERF, respectively.</p>

Enclosure 2

H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2

Seismic Probabilistic Risk Assessment
Regulatory Commitments

List of Regulatory Commitments

The following table identifies the actions from Enclosure 1 to which the H. B. Robinson Steam Electric Plant, Unit No. 2 (HBRSEP), has committed. Other site actions in this submittal, with the exception of those listed in the table below, are provided for information purposes and are not considered commitments. Please direct any questions regarding these commitments to Mr. Art Zaremba, Director – Nuclear Fleet Licensing, at (980) 373-2062.

Commitment Description	Scheduled Completion Date
<p><u>PM1: Plant Modification – Permanent</u></p> <p>The existing pre-staged discharge hose from the FLEX AFW pumps will be reconfigured to include a branch which routes to the existing FLEX AFW connection (AFW-165) located inside the Motor-Driven AFW Pump Room. The current configuration connects to the FLEX AFW connection near the Steam-Driven AFW Pump (AFW-166). The new configuration will feature isolation of the two branches such that the branch which connects to AFW-165 will not be vulnerable to a potential failure of the Turbine Building Class III structure.</p>	<p>July 30, 2021</p>
<p><u>PM2: Plant Modification – Permanent</u></p> <p>For the existing Deepwell Pumps A, B and C, isolation valves, hose connections and pipe will be installed to protect the above ground portion of the piping from the seismic event.</p>	<p>May 29, 2021</p>
<p><u>PM3: Plant Modification – Permanent</u></p> <p>For the existing Deepwell Pumps A, B and C, hose and/or pipe will be routed from each pump to the suction header for the existing FLEX AFW pumps. The shortest and most seismically preferable routes will be utilized, as best possible. For high traffic areas, hose will be permanently staged in lieu of permanent installation. To mitigate probable damage, the routes will include sections to allow for easy disassembly and connection of new sections.</p>	<p>June 30, 2021</p>
<p><u>PM4: Plant Modification – Permanent</u></p> <p>Install a new Deepwell Pump E to provide suction directly to the existing FLEX AFW pumps. The construction of the new deepwell pump will include similar seismically rugged features as existing Deepwell Pump D. The new Deepwell Pump E and appurtenances will be located, or otherwise protected, to prevent adverse seismic impact from other structures or equipment. The new deepwell pump will be located and configured to support time sensitive operator actions per the guidance of NEI 12-06, Revision 2, “Diverse and Flexible Coping Strategies (FLEX) Implementation Guide.” Power for the new deepwell pump will be provided by normal AC power, and a new diesel generator, similar to existing Deepwell Pumps A, B and C.</p>	<p>December 31, 2021</p>

Commitment Description	Scheduled Completion Date
Submit a letter to the U.S. Nuclear Regulatory Commission (NRC) providing notification that implementation of the four permanent plant modifications (i.e., PM1, PM2, PM3, and PM4) have been completed.	January 31, 2022