



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, ILLINOIS 60532-4352

May 19, 2020

EA-20-053

Mr. Bryan C. Hanson
Senior VP, Exelon Generation Co., LLC
President and CNO, Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

**SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3 – NRC INSPECTION
REPORT 05000237/2020012 AND 05000249/2020012 AND APPARENT
VIOLATION**

Dear Mr. Hanson:

On April 24, 2020, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Dresden Nuclear Power Station, Units 2 and 3 and discussed the results of this inspection with Mr. P. Karaba, Site Vice President and other members of your staff. The results of this inspection are documented in the enclosed report.

The enclosed report documents an apparent violation of 10 CFR 50.59. We are considering escalated enforcement for the apparent violation using traditional enforcement because the apparent violation potentially impacts the ability of the NRC to perform its regulatory oversight function consistent with our Enforcement Policy, which can be found at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>. Because we have not made a final determination, no notice of violation is being issued at this time. Please be aware that further NRC review may prompt us to modify the number and characterization of the apparent violation(s).

We intend to issue our final enforcement decision, in writing, within 90 days from the date of this letter. Before we make a final decision, you may choose to communicate your position both on the facts and assumptions used to arrive at the violation and final enforcement decision by either (1) attending and presenting at a pre-decisional enforcement conference or (2) submitting your position in writing. The focus of a pre-decisional enforcement conference is to discuss the severity and identification of the apparent violation and your corrective actions.

If you choose to respond in writing, please mark your response "Response to Apparent Violation in NRC Inspection Report 05000237/2020012 AND 05000249/2020012; EA-20-053" and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region III, and a copy to the NRC Resident Inspector at Dresden Station, within 45 days of the date of this letter. Responses related to this apparent violation should include: (a) the reason for the apparent violation or, if contested, the basis for disputing the violation; (b) the corrective steps that have been taken and

the results achieved; (c) the corrective steps that will be taken; (d) the date when full compliance will be achieved; and (e) any other information you believe the NRC should consider before making a final enforcement decision. Your response may reference or include previously docketed correspondence if the correspondence adequately addresses the required response.

If you choose to request a PEC, the conference will afford you the opportunity to provide your perspective on these matters and any other information that you believe the NRC should take into consideration before making an enforcement decision. The decision to hold a pre-decisional enforcement conference does not mean that the NRC has determined that a violation has occurred or that enforcement action will be taken. This conference would be conducted to obtain information to assist the NRC in making an enforcement decision. The topics discussed during the conference may include information to determine whether a violation occurred, information to determine the significance of a violation, information related to the identification of a violation, and information related to any corrective actions taken or planned. If you request a pre-decisional enforcement conference, it should be held within 45 days of the date of this letter. Please provide information you would like us to consider or discuss with you at least 10 days prior to any scheduled conference. If you choose to attend a pre-decisional enforcement conference, it will be open for public observation.

Please contact Karla K. Stoedter at 630-829-9731, or in writing using the address above, within 10 days from the date of this letter to notify us of your intentions. If we have not heard from you within 10 days, and an extension of time has not been granted by us, we will continue with our enforcement decision.

Additionally, one finding of very low safety significance (Green) is documented in this report. This finding involved a violation of NRC requirements. We are treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violations or the significance or severity of the violations documented in this inspection report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement; and the NRC Resident Inspector at Dresden Nuclear Power Station, Units 2 and 3.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; and the NRC Resident Inspector at Dresden Nuclear Power Station, Units 2 and 3.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding." To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Sincerely,

David Curtis

Digitally signed by David
Curtis
Date: 2020.05.19 11:00:51
-05'00'

David Curtis, Acting Director
Division of Reactor Safety

Docket Nos. 05000237 and 05000249
License Nos. DPR-19 and DPR-25

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV®

Letter to Bryan Hanson from David Curtis dated May 19, 2020.

SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3 – NRC INSPECTION REPORT 05000237/2020012 AND 05000249/2020012 AND APPARENT VIOLATION

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000237 and 05000249

License Numbers: DPR-19 and DPR-25

Report Numbers: 05000237/2020012 and 05000249/2020012

Enterprise Identifier: I-2020-012-0021

Licensee: Exelon Generation Company, LLC

Facility: Dresden Nuclear Power Station, Units 2 and 3

Location: Morris, IL

Inspection Dates: April 01, 2020 to April 24, 2020

Inspectors: L. Rodriguez, Reactor Inspector

Approved By: David Curtis, Acting Director
Division of Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a NRC inspection at Dresden Nuclear Power Station, Units 2 and 3, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

List of Findings and Violations

Failure to Verify the Ultimate Heat Sink and Diesel Generator Cooling Water Design Adequacy			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000237,05000249/2020012-01 Open/Closed	[H.6] - Design Margins	71111.07T
<p>The inspectors identified a Green finding and associated Non-cited Violation (NCV) of 10 CFR 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to verify or check the adequacy of the Ultimate Heat Sink (UHS) and the Diesel Generator Cooling Water (DGCW) system design for a loss of dam scenario. Specifically, Analyses DRE16-0011, 87-0870/915, and Engineering Change 403120 failed to ensure the DGCW system would be able to perform its safety function at the UHS temperature, elevation, and volume extremes expected following a loss of dam event given the currently available UHS capacity and the allowable UHS capacity.</p>			

Failure to Have Appropriate Evaluation to Support a Change to the Required Ultimate Heat Sink Coping Time and Capacity			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Not Applicable	AV 05000237,05000249/2020012-02 Open EA-20-053	Not Applicable	71111.07T
<p>The inspectors identified an Apparent Violation (AV) of 10 CFR 50.59, "Changes, Tests, and Experiments," for the licensee's failure to have a written evaluation which provided the bases for determining a change made pursuant to 10 CFR 50.59(c) did not require a license amendment. Specifically, the licensee approved a change to the Updated Final Safety Analysis Report (UFSAR) which reduced the Ultimate Heat Sink (UHS) coping time and capacity from four days to 24 hours. This evaluation failed to provide a basis for the determination that the change would not result in more than a minimal increase in the likelihood of occurrence of a malfunction of the DGCW system previously evaluated in the UFSAR.</p>			

Additional Tracking Items

None.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards. Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), regional inspectors were directed to begin telework. Regional baseline inspections were evaluated, and it was determined the objectives and requirements stated in the IP could be performed remotely for the inspection documented below.

REACTOR SAFETY

71111.07T - Heat Sink Performance

Triennial Review (IP Section 03.02) (1 Sample)

The inspectors evaluated heat exchanger/sink performance on the following:

- (1) Ultimate Heat Sink, Sections 02.02.d.2 and 02.02.d.6

INSPECTION RESULTS

Failure to Verify the Ultimate Heat Sink and Diesel Generator Cooling Water Design Adequacy			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000237,05000249/2020012-01 Open/Closed	[H.6] - Design Margins	71111.07T
<p>The inspectors identified a Green finding and associated Non-cited Violation (NCV) of 10 CFR 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to verify or check the adequacy of the Ultimate Heat Sink (UHS) and the Diesel Generator Cooling Water (DGCW) system design for a loss of dam scenario. Specifically, Analyses DRE16-0011, 87-0870/915, and Engineering Change 403120 failed to ensure the DGCW system would be able to perform its safety function at the UHS temperature, elevation, and volume extremes expected following a loss of dam event given the currently available UHS capacity and the allowable UHS capacity.</p>			
<p><u>Description:</u></p> <p>The normal heat sink for Dresden Station is the Kankakee river. Upon a postulated catastrophic failure of the Dresden Lock and Dam, the normal heat sink would become unavailable because the river level would fall below the high point of the intake and discharge canals (the 494.2' and 498' invert elevations, respectively). Water would be trapped in both</p>			

canals between their high points and the plant, but only the trapped water volume in the intake canal above the suction of the Diesel Generator Cooling Water (DGCW) pumps (at an elevation of 487.7') is considered available from the Ultimate Heat Sink (UHS) as described in Section 9.2.5.3.1 of the Updated Final Safety Analysis Report (UFSAR). This credited UHS water volume (two million gallons) was supposed to be sufficient to support the safe shut down of Units 2 and 3 for approximately four days without the need for off-site power or additional make-up water. The licensee performs annual bathymetric surveys to ensure the UFSAR required UHS credited volume is satisfied per DTS 4450-04, "Dresden Credited Ultimate Heat Sink Bathymetric Surveillance for Intake and Discharge Canals."

The inspectors reviewed calculation DRE16-0011, "Required Ultimate Heat Sink Capacity," dated May 2, 2016, which is the design basis calculation performed to determine how long the inventory in the UHS would last following a normal plant shutdown upon a failure of the Dresden Lock and Dam. The calculation used the 2015 bathymetric survey results as an input to determine the water volume available in the UHS below the 494.2' elevation, since any water above that elevation would drain out of the canal in the event of a Dresden Lock and Dam failure. The calculation assumes an initial total water volume of 2.449 million gallons below the 494.2' elevation in the intake canal. Of this volume, the calculation assumes a credited UHS water volume of 2.144 million gallons (volume available between the 487.7' and 494.2' elevations). The calculation concluded the UHS credited water volume would last approximately 2.6 days. The calculation also demonstrated the UHS will reach a maximum of 111 degrees Fahrenheit during the scenario. Therefore, equipment relied on following a lock and dam failure is required to operate at that maximum temperature. As discussed below, the DGCW pumps were not fully evaluated to operate at 111 degrees Fahrenheit.

The inspectors also reviewed AR 4206201, "Bathymetric Survey Results for 2018," which documented a significant reduction in the UHS capacity. The 2018 bathymetric survey results demonstrated a nominal total water volume of 2.006 million gallons in the intake canal below the 494.2' elevation, and a nominal credited water volume of 1.835 million gallons between the 487.67' and 494.2' elevations. Based on the reduced inventory in the UHS, the results of calculation DRE16-0011 were no longer bounding. Therefore, the UHS maximum temperature would be expected to exceed 111 degrees Fahrenheit, and the UHS credited volume would be expected to last less than 2.6 days.

As a corrective action to AR 4206201, the licensee created EC 629625, "Licensing Basis of the Ultimate Heat Sink (UHS) Credited Volume." This engineering change was intended to determine the minimum UHS volume needed if water replenishment to the UHS could be established within 24 hours following a failure of the Dresden Lock and Dam. A 24-hour coping time was selected because procedure DOA 0010-01, "Dresden Lock and Dam Failure," states a supply to the intake canal is to be provided within 24 hours. The engineering change determined a minimum credited water volume of one million gallons was sufficient to cope for 24 hours before the UHS had to be replenished. As a result, a change to UFSAR Section 9.2.5.3.1 was processed to revise the NRC approved four day coping time to 24 hours. In addition, procedure DTS 4450-04 was revised to change the acceptance criteria for the UHS credited water volume from two million gallons to one million gallons.

The inspectors reviewed the engineering change and determined its conclusion was not fully supported because the licensee had not demonstrated that one million gallons of water was sufficient to maintain the safe shutdown condition of both units following a lock and dam failure. Specifically, the licensee had not reviewed Calculation DRE16-0011 to determine

how the reduction in UHS volume impacted the UHS temperature following a dam failure. A reduced volume would increase the maximum UHS temperature expected following the event. As a result, the inspectors questioned whether important to safety (U2/U3 diesel driven fire pump, travel screen refuse pumps, etc.) and safety related (DGCW pumps, isolation condenser, etc.) equipment would be able to perform its safety function following a Dresden Lock and Dam failure.

The inspectors also reviewed calculations 87-0870/915, "Unit 3 Diesel Cooling Water Pump NPSH, Fuel Oil Line Pressure Head and Air Start Receiver Valve Pressure Rating Evaluation," and EC 403120, "Computation of DGCW Pumps NPSHA During Dam Failure," which evaluate the Net Positive Suction Head (NPSH) of the DGCW pumps during a dam failure. The inspectors noted that NPSH had only been evaluated down to the 492' elevation and at a maximum water temperature of 101.69 degrees Fahrenheit. Since the credited water volume in the UHS elevation goes down to the 487.7' elevation, the inspectors questioned whether the DGCW pumps would be expected to operate at that elevation. In addition, since the UHS max temperature was expected to exceed 111 degrees Fahrenheit, as discussed earlier, the inspectors questioned whether the DGCW pumps could operate at the higher water temperatures since the NPSH evaluated for the pumps did not bound the expected UHS conditions. The inspectors also requested the vortexing evaluation demonstrating the UHS elevation the pumps could be expected to operate down to. The licensee did not have a calculation that evaluated vortexing for the DGCW pumps. Based on estimates performed by the inspectors, a submergence over a foot and up to several feet above the pumps suction would be required given the design of the DGCW system. Therefore, the inspectors concluded the credited UHS volume would be further reduced by these factors since DGCW pump operation with an UHS elevation down to 487.7' was not ensured. This, in turn, further reduced the less than 2.6 days available of coping time discussed previously.

Corrective Actions: The licensee captured the inspectors' concerns in Corrective Action Program documents referenced below. The licensee evaluated the current UHS capability and demonstrated the UHS could be replenished before the operability and/or functionality of the DGCW system, and other important to safety systems, would be impacted by the inspector identified design control deficiencies.

Corrective Action References: AR 4318708, "NRC Question of 50.59 Screening"
AR 4322212, "2020 UHS Inspection: DRE16-0011 UFSAR Timely Update"
AR 4322375, "2020 NRC UHS Inspection: UFSAR Revision UHS Volume"
AR 4322395, "2020 UHS Inspection - NRC Calculation Question"
AR 4323025, "2020 UHS Inspection - IR 2533713 Action not Complete"
AR 4325402, "Timber Mat Contact"

Performance Assessment:

Performance Deficiency: The failure to verify or check the adequacy of the UHS and the DGCW system design for a loss of dam scenario was a performance deficiency and a violation of 10 CFR 50, Appendix B, Criterion III, "Design Control." Specifically, Analyses DRE16-0011, 87-0870/915, and EC 403120 failed to ensure the DGCW system would be able to perform its safety function at the UHS temperature, elevation, and volume extremes expected following a loss of dam event given the currently available UHS capacity and the allowable UHS capacity.

Screening: The inspectors determined the performance deficiency was more than minor

because it was associated with the Design Control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the current and allowed reduced UHS capacity did not reasonably ensure the availability, reliability or capability of the UHS and the DGCW system to prevent undesirable consequences following a loss of dam event. Similar to example 3.g of IMC 0612 Appendix E, the UHS and DGCW system analyses assumed a higher UHS capacity value which did not bound the UHS temperature, elevation, and volume extremes encountered following a loss of dam scenario to ensure a safe shutdown condition could be maintained.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors determined this finding is of very low safety significance (Green) because although the finding is a deficiency which affected the design and qualification of the UHS and the DGCW system, those SSCs maintained their operability and probabilistic risk assessment functionality.

Cross-Cutting Aspect: H.6 - Design Margins: The organization operates and maintains equipment within design margins. Margins are carefully guarded and changed only through a systematic and rigorous process. Special attention is placed on maintaining fission product barriers, defense-in-depth, and safety related equipment. Specifically, when undesirable UHS bathymetric survey results were obtained, margins were not carefully guarded to ensure equipment was maintained within its design margins.

Enforcement:

Violation: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. The design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.

Section 9.2.5.3.1 of the UFSAR stated that only the part of the intake canal trapped inventory above the suction of the diesel generator cooling water pumps (2 million gallons) is considered available from the UHS, as the makeup path potentially relies on on-site power. This inventory lasts approximately four days following extended power uprate.

Contrary to the above, since May 2, 2016, the licensee failed to have design control measures that verified or checked the adequacy of the design of the UHS. Specifically, analyses DRE16-0011, 87-0870/915, and Engineering Change 403120 failed to ensure the UHS design basis as described in UFSAR Section 9.2.5.3.1 was verified to ensure the DGCW system would be able to perform its safety function at the UHS temperature, elevation, and volume extremes expected following a loss of dam event given: (1) the reduced coping time available documented in calculation DRE16-0011; (2) the reduced available UHS capacity documented in AR 4206201; and (3) the further reduced allowable UHS capacity documented in Engineering Change 629625.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Failure to Have Appropriate Evaluation to Support a Change to the Required Ultimate Heat Sink Coping Time and Capacity			
Cornerstone	Severity	Cross-Cutting Aspect	Report Section
Not Applicable	Apparent Violation AV 05000237,05000249/2020012-02 Open EA-20-053	Not Applicable	71111.07T
<p>The inspectors identified an Apparent Violation (AV) of 10 CFR 50.59, "Changes, Tests, and Experiments," for the licensee's failure to have a written evaluation which provided the bases for determining a change made pursuant to 10 CFR 50.59(c) did not require a license amendment. Specifically, the licensee approved a change to the Updated Final Safety Analysis Report (UFSAR) which reduced the Ultimate Heat Sink (UHS) coping time and capacity from four days to 24 hours. This evaluation failed to provide a basis for the determination that the change would not result in more than a minimal increase in the likelihood of occurrence of a malfunction of the DGCW system previously evaluated in the UFSAR.</p>			
<p><u>Description:</u></p> <p>The UHS for Dresden Station following a catastrophic failure of the Dresden Lock and Dam is the trapped water volume in the intake canal above the suction of the DGCW pumps as described in Section 9.2.5.3.1 of the UFSAR. This credited UHS water volume (two million gallons) was supposed to be sufficient to support the safe shut down of Units 2 and 3 for approximately four days without the need for off-site power or additional make-up water. The licensee performed bathymetric surveys annually using procedure DTS 4450-04, "Dresden Credited Ultimate Heat Sink Bathymetric Surveillance for Intake and Discharge Canals," to ensure the UHS contains the credited water volume.</p> <p>In 2018, the licensee generated corrective action document AR 4206201, "Bathymetric Survey Results for 2018," because the credited UHS water volume was found to be below the acceptance criteria of two million gallons. It was found to only contain 1.835 million gallons. As a corrective action, the licensee generated Engineering Change (EC) 629625, "Licensing Basis of the UHS Credited Volume," on October 17, 2019. This EC was intended to determine the minimum UHS volume needed if water replenishment to the UHS could be established within 24 hours following a lock and dam failure. A 24-hour coping time was selected because procedure DOA 0010-01, "Dresden Lock and Dam Failure," states a supply to the intake canal is to be provided within 24 hours. The EC determined a minimum credited water volume of one million gallons was sufficient to cope for 24 hours before the UHS had to be replenished. As a result, the licensee performed 50.59 Screening 2019-134, "Licensing Basis of the Ultimate Heat Sink (UHS) Credited Volume and UFSAR Update," to change the UHS coping time described in UFSAR Section 9.2.5.3.1 from four days to 24 hours. In addition, they changed the bathymetric survey acceptance criteria for the credited UHS water volume from two million gallons to one million gallons.</p> <p>The inspectors challenged the adequacy of the screening because reducing the UHS required capacity also reduced the coping time for which the UHS could be credited to maintain the safe shutdown condition from four days to 24 hours, an adverse impact to the UHS design function. The licensee performed 50.59 Evaluation 2020-02-001, "Update to UFSAR Description of the UHS Credited Volume." The evaluation concluded a license amendment was not required for implementing the desired UHS change, in part, because the</p>			

proposed activity did not result in any increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety previously evaluated in the UFSAR. The inspectors reviewed the 50.59 evaluation and disagreed with the licensee's conclusion because reducing the UHS capacity resulted in changes to the expected UHS temperature, elevation and volume extremes. As discussed previously in this report, the licensee had not evaluated the potential impact these extremes could have on the operation of the DGCW system. As a result, the licensee had not appropriately evaluated whether these extremes resulted in a more than minimal increase in the likelihood of a system malfunction when determining whether a license amendment request was needed.

The inspectors also reviewed procedure DOA 0010-01 and had concerns with the licensee's ability to begin replenishing the UHS within 24 hours following a loss of the Dresden Lock and Dam. Once the event occurs, the licensee planned to deploy two portable pumps approximately 250 feet to the remaining river channel. While the procedure discussed a potential pump deployment area, the exact location will depend on the physical conditions after the event. Since the freshly uncovered river bed was expected to be significantly muddy, the licensee planned to place more than 30 timber mats to create a travel path supporting pump deployment. Stacking of the timber mats may be required if the mats begin sinking when a load is placed on them. The timber mats were not staged onsite and will have to be procured from an outside supplier. The inspectors noted the contact information for the timber mat supplier was not readily available to the operations staff, which could cause additional delays in procedure implementation. The licensee estimated it would take approximately 20 hours to implement their strategy to begin replenishing the UHS with the portable pumps. The inspectors noted the licensee's strategy was difficult and time consuming, with inherently difficult human actions involved. If the UHS volume were allowed to degrade to the EC 629625 acceptable volume, the reliability of the human actions would be reduced because of the decrease in available margin. The available margin was considered to be the extra time beyond the 20 hours estimated to implement the strategy. The change allowed the available margin to be reduced from over three days to approximately four hours. Therefore, based on a review of procedure DOA 0010-01 and the UHS analyses, the inspectors concluded the licensee should have obtained a license amendment prior to implementing the proposed change to the UHS required volume and its associated coping time as discussed in the UFSAR because the change resulted in a more than minimal increase in the likelihood of occurrence of a malfunction of the UHS and the DGCW system.

Corrective Actions: The licensee captured the inspectors' concerns in Corrective Action Program documents referenced below. The licensee evaluated the current UHS capability and demonstrated the UHS could be replenished before the operability and/or functionality of the DGCW system, and other important to safety systems, would be impacted by the deficiencies described previously. The licensee also plans to perform an evaluation to address the regulatory impacts of the apparent 10 CFR 50.59 violation.

Corrective Action References: AR 4322375, "2020 NRC UHS Inspection: UFSAR Revision UHS Volume"
AR 4323025, "2020 UHS Inspection - IR 2533713 Action not Complete"
AR 4325402, "Timber Mat Contact"

Performance Assessment:

The NRC determined that this violation was associated with a previously documented finding assessed using the significance determination process. Specifically, this apparent violation is associated with Non-Cited Violation (NCV) 05000249,05000237/2020012-01 which is a

Green finding and associated NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," documented in this report.

Enforcement:

The ROP's significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it is necessary to address this violation which impedes the NRC's ability to regulate using traditional enforcement to adequately deter non-compliance.

Severity: The NRC has not made an enforcement decision. This violation is being treated as an apparent violation (AV) pending a final enforcement determination.

Violation: Title 10 CFR 50.59, "Changes, Test, and Experiments," Section (d)(1), requires the licensee to maintain records of changes in the facility, of changes in procedures, and of tests and experiments made pursuant 10 CFR 50.59(c). These records must include a written evaluation which provides the bases for the determination that the change, test, or experiment does not require a license amendment pursuant to paragraph (c)(2) of this section. Title 10 CFR 50.59(c)(2)(ii) states, in part, that a licensee shall obtain a license amendment pursuant to 10 CFR 50.90 prior to implementing a proposed change, test, or experiment if the change, test, or experiment would result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system or component (SSC) important to safety previously evaluated in the final safety analysis report (as updated).

Section 9.2.5.3.1 of the UFSAR stated that only the part of the intake canal trapped inventory above the suction of the diesel generator cooling water pumps (2 million gallons) is considered available from the UHS, as the makeup path potentially relies on on-site power. This inventory lasts approximately four days following extended power uprate. If the off-site power is restored within the 4-day period, the time would increase because the entire volume of the intake canal would be available with no diesel generator cooling required.

Since October 17, 2019, to the present, the licensee apparently failed to maintain a record of a change to the facility that included a written evaluation which provided the bases for determining the change made pursuant to 10 CFR 50.59(c) did not require a license amendment. Specifically, on October 17, 2019, the licensee approved a change to the UFSAR that changed the coping time and capacity required of the UHS from four days to 24 hours. The written evaluation documented by 10 CFR 50.59 Evaluation 2020-02-001 on February 17, 2020, did not provide a basis for the determination that the change would not result in more than a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety previously evaluated in the final safety analysis report (as updated). Specifically, the licensee did not have a written evaluation that demonstrated there was no more than a minimal increase in the likelihood of occurrence of a malfunction of the DGCW system given the change to the required UHS capacity.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On April 24, 2020, the inspectors presented the NRC inspection results to Mr. P. Karaba, Site Vice President and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.07T	Calculations	87-0870/915	Unit 3 Diesel Cooling Water Pump NPSH, Fuel Oil Line Pressure Head and Air Start Receiver Valve Pressure Rating Evaluation	1C
		DRE03-0026	Analysis of the Intake Canal, CCSW Heat Exchanger, and Temporary Pumps Following a Dam Failure and 1 Inch LOCA	1
		DRE16-0011	Required Ultimate Heat Sink (UHS) Capacity	0A
		DRE16-0011	Required Ultimate Heat Sink (UHS) Capacity	0
	Corrective Action Documents	2532555	UHS Insp. - Calc for DGCW Pumps Based at 501 Elevation	07/24/2015
		2532734	UHS NRC Insp. - Basis for UHS Vol. (2 Million Gallons)	07/25/2015
		2533713	Further Information for IR 02532555	07/28/2015
		4206201	Bathymetric Survey Results for 2018	12/27/2018
		4206439	UFSAR Update Required to Address UHS Related Issue	12/28/2018
		4227793	Strategic Engineering Review of 2018 UHS Survey Results	03/08/2019
	Corrective Action Documents Resulting from Inspection	4318708	NRC Question of 50.59 Screening	02/17/2020
		4322212	2020 UHS Inspection: DRE16-0011 UFSAR Timely Update	02/28/2020
		4322375	2020 NRC UHS Inspection: UFSAR Revision UHS Volume	02/28/2020
		4322395	2020 UHS Inspection - NRC Calculation Question	02/28/2020
		4323025	2020 UHS Inspection - IR 2533713 Action not Complete	03/02/2020
	Engineering Changes	4325402	Timber Mat Contact	03/10/2020
		382082	Licensing Basis of the Ultimate Heat Sink (UHS) and the Impact of Silting	0
		403120	Computation of DGCW Pumps NPSHA During Dam Failure	0
	Engineering Evaluations	629625	Licensing Basis of the Ultimate Heat Sink (UHS) Credited Volume and UFSAR Update	0
		2020-02-001	Update to UFSAR Description of the Ultimate Heat Sink (UHS) Credited Volume	0
	Miscellaneous	23218036.00	2018 Bathymetric/Volume Survey of the Intake/UHS Canal	10/25/2018
		23219026.00	2019 Bathymetric/Volume Survey of the 2/3 Intake/UHS Canal	10/23/2019
		EA Project No. 1500411	2017 Bathymetric Survey of the Intake Canal at Exelon Generation Company's Dresden Generating Station	1

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Procedures	DOA 0010-01	Dresden Lock and Dam Failure	36
		DOA 0010-01	Dresden Lock and Dam Failure	35
		DOA 0010-S1	Key Phone Numbers for DOA 0010 Block Procedures	16
		DOS 0010-01	Dresden Dam Failure Equipment Test	23