UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 13, 2021

Mr. David P. Rhoades
Senior Vice President
Exelon Generation Company, LLC
President and Chief Nuclear Officer (CNO)
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2 - ISSUANCE OF AMENDMENT NOS. 250 AND 236 TO RENEWED FACILITY OPERATING LICENSES RE: A LICENSE AMENDMENT TO TECHNICAL SPECIFICATION 3.7.3, "ULTIMATE HEAT SINK (UHS)" (EPID L-2020-LLA-0165)

Dear Mr. Rhoades:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment Nos. 250 and 236 to Renewed Facility Operating License Nos. NPF-11 and NPF-18 for the LaSalle County Station, Units 1 and 2, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated July 17, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20204A775), as supplemented by letters dated September 11, 2020 (ADAMS Accession No. ML20259A454), October 22, 2020 (ADAMS Package Accession No. ML20296A616), and April 7 and April 16, 2021 (ADAMS Accession Nos. ML21097A247 and ML21106A176, respectively).

The amendments revised TS 3.7.3, "Ultimate Heat Sink (UHS)," for the LaSalle County Station, Units 1 and 2, to expand the TS temperature limit of the cooling water supplied to the plant from the UHS to vary with the diurnal cycle by changing the average sediment level limit in the UHS to $\leq$ 6 inches.

A copy of the related safety evaluation is also enclosed. A Notice of Issuance will be included in the Commission's monthly *Federal Register* notice.

Sincerely,

/RA/

Bhalchandra K. Vaidya, Project Manager
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-373 and 50-374

Enclosure:
1. Amendment No. 250 to NPF-11
2. Amendment No. 236 to NPF-18
3. Safety Evaluation

cc: Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-373

LASALLE COUNTY STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 250
Renewed License No. NPF-11

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Exelon Generation Company, LLC (the licensee) dated July 17, 2020, as supplemented by letters dated September 11, 2020, October 22, 2020, April 7, 2021, and April 16, 2021, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-11 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 250, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This amendment is effective as of its date of issuance and shall be implemented within 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Nancy L. Salgado

Digitally signed by Nancy L. Salgado
Date: 2021.07.13 16:41:20 -04'00'

Nancy L. Salgado, Chief
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility Operating License and Technical Specifications

Date of Issuance: July 13, 2021

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-374

LASALLE COUNTY STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 236
Renewed License No. NPF-18

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Exelon Generation Company, LLC (the licensee) dated July 17, 2020, as supplemented by letters dated September 11, 2020, October 22, 2020, April 7, 2021, and April 16, 2021, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-18 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 236, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This amendment is effective as of its date of issuance and shall be implemented within 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Nancy L. Salgado

Digitally signed by Nancy L. Salgado
Date: 2021.07.13 16:41:51 -04'00'

Nancy L. Salgado, Chief
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility Operating License and Technical Specifications

Date of Issuance: July 13, 2021

ATTACHMENT TO LICENSE AMENDMENT NOS. 250 AND 236

RENEWED FACILITY OPERATING LICENSE NOS. NPF-11 AND NPF-18

LASALLE COUNTY STATION, UNITS 1 AND 2

DOCKET NOS. 50-373 AND 50-374

Replace the following pages of the Renewed Facility Operating Licenses and Appendix A, Technical Specifications, with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Renewed Facility Operating License No. NPF-11

REMOVE	INSERT
Page 3	Page 3

Renewed Facility Operating License No. NPF-18

REMOVE	INSERT
Page 3	Page 3

Technical Specifications

REMOVE	INSERT
TS 3.7.3-1	TS 3.7.3-1
TS 3.7.3-2	TS 3.7.3-2
TS 3.7.3-3	TS 3.7.3-3

(3) Exelon Generation Company, LLC, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

Am. 146 01/12/01

(4) Exelon Generation Company, LLC, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

Am. 202 07/21/11

(5) Exelon Generation Company, LLC, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of LaSalle County Station, Units 1 and 2, and such Class B and Class C low-level radioactive waste as may be produced by the operation of Braidwood Station, Units 1 and 2, Byron Station, Units 1 and 2, and Clinton Power Station, Unit 1.

C. This renewed license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

Am. 198 09/16/10

(1) Maximum Power Level

The licensee is authorized to operate the facility at reactor core power levels not in excess of full power (3546 megawatts thermal).

Am. 250 07/13/21

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 250, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

Am. 194 08/28/09

(3) DELETED

Am. 194 08/28/09

(4) DELETED

Am. 194 08/28/09

(5) DELETED

(2) Pursuant to the Act and 10 CFR Part 70, to receive, possess and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;

(3) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(4) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

Am. 189
07/21/11

(5) Exelon Generation Company, LLC, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of LaSalle County Station, Units 1 and 2, and such Class B and Class C low-level radioactive waste as may be produced by the operation of Braidwood Station, Units 1 and 2, Byron Station, Units 1 and 2, and Clinton Power Station, Unit 1.

C. This renewed license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

Am. 185
09/16/10

(1) Maximum Power Level

The licensee is authorized to operate the facility at reactor core power levels not in excess of full power (3546 megawatts thermal). Items in Attachment 1 shall be completed as specified. Attachment 1 is hereby incorporated into this license.

Am. 236
07/13/21

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 236, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3.7 PLANT SYSTEMS

3.7.3 Ultimate Heat Sink (UHS)

LCO 3.7.3 The Core Standby Cooling System (CSCS) pond shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CSCS pond inoperable due to sediment deposition.	A.1 Restore CSCS pond to OPERABLE status.	90 days
B. Required Action and associated Completion Time of Condition A not met. OR CSCS pond inoperable for reasons other than Condition A.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Verify cooling water temperature supplied to the plant from the CSCS pond is within the limits of Figure 3.7.3-1.	Once per hour when supply from CSCS pond ≥ 101°F AND In accordance with the Surveillance Frequency Control Program
SR 3.7.3.2	Verify average sediment level is ≤ 6 inches in the intake flume and the CSCS pond.	In accordance with the Surveillance Frequency Control Program

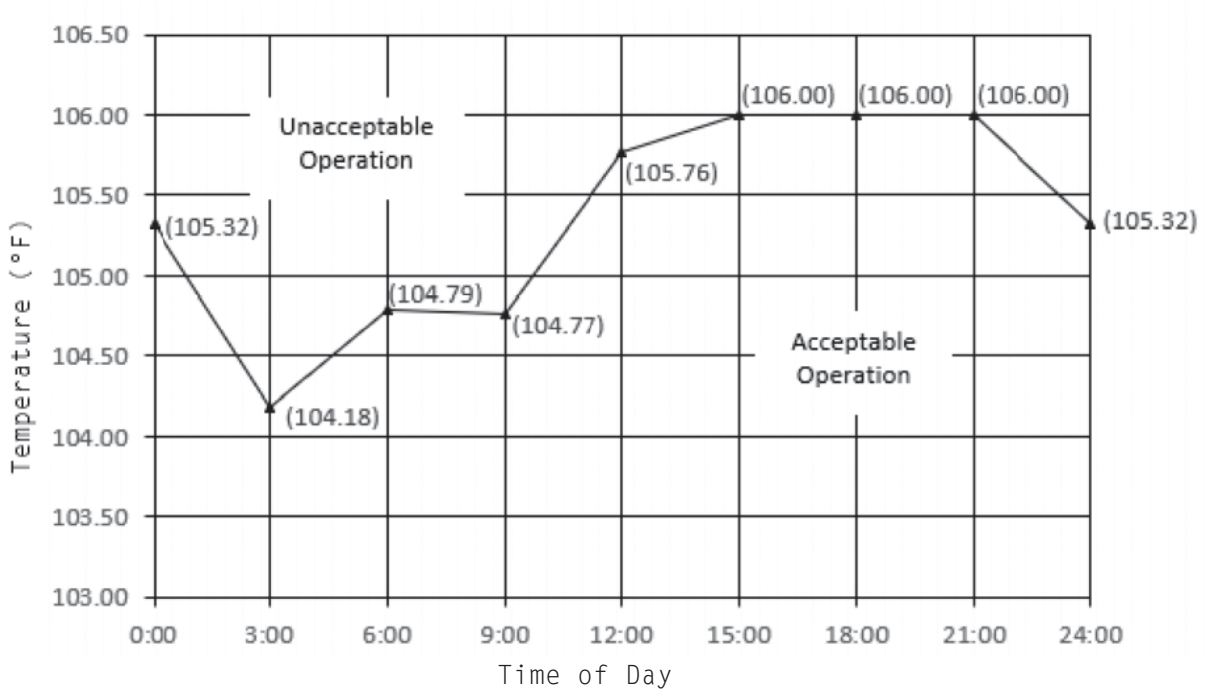

Figure 3.7.3-1 (page 1 of 1)
Temperature of Cooling Water Supplied to the Plant from the
CSCS Pond Versus Time of Day Requirements

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 250 AND 236 TO RENEWED

FACILITY OPERATING LICENSE NOS. NPF-11 AND NPF-18

EXELON GENERATION COMPANY, LLC

LASALLE COUNTY STATION, UNITS 1 AND 2

DOCKET NOS. 50-373 AND 50-374

1.0 INTRODUCTION

By application dated July 17, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20204A775), as supplemented by letters dated September 11, 2020 (ADAMS Accession No. ML20259A454); October 22, 2020 (ADAMS Package Accession No. ML20296A616); and April 7 and April 16, 2021 (ADAMS Accession Nos. ML21097A247 and ML21106A176, respectively), Exelon Generation Company, LLC (the licensee) requested changes to the technical specifications (TSs) for LaSalle County Station, Units 1 and 2 (LSCS), by a license amendment request (LAR).

The supplemental letters dated September 11, 2020, October 22, 2020, April 7, 2021, and April 16, 2021, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC, the Commission) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on December 1, 2020 (85 FR 77274).

2.0 PROPOSED CHANGES

In the LAR, the licensee requested changes to the TSs in Renewed Facility Operating License Nos. NPF-11 and NPF-18 for the LSCS,. Recent summer meteorological conditions have resulted in the TS ultimate heat sink (UHS) temperature limit being challenged; and meteorological conditions in the future may continue challenging the current TS limits. The proposed changes would revise the LSCS TS 3.7.3, "Ultimate Heat Sink (UHS)," limits of the diurnal curve in TS Figure 3.7.3-1 and would modify the sediment level limit specified in Surveillance Requirement (SR) 3.7.3.2 from "sediment level is ≤ 1.5 ft" to "average sediment level is ≤ 6 inches" and delete SR 3.7.3.3 verifying that core standby cooling system (CSCS) pond bottom elevation is less than or equal to 686.5 feet. Also, a correction would be made to TS 3.7.3 by deleting Condition B and modifying the SR 3.7.3.1 Frequency to incorporate the 1-hour monitoring frequency. The CSCS pond referred to in the SRs is also known as the UHS in the following discussion.

2.1 Description of the UHS

The LSCS UHS is an excavated pond located below and integral with the cooling lake. The UHS has a bottom elevation of approximately 685 feet and a top elevation at 690 feet. The 2058-acre cooling lake covers and extends beyond the UHS with a top elevation of approximately 700 feet. In the unlikely event that the main dike is breached, there is a submerged pond within the cooling lake for the LSCS that is designed to hold 460 acre-feet of water with a surface area of 83 acres. Failure of the LSCS cooling lake dike results in the UHS being the remaining source of cooling water to plant safety systems. The UHS is designed to provide the heat sink required by Appendix A to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "General Design Criteria for Nuclear Power Plants," General Design Criterion (GDC) 44, "Cooling water." The volume of the CSCS pond is sized to permit the safe shutdown and cooldown of both LSCS units for a 30-day period design-basis event (DBE) with no additional makeup water source. The UHS DBE includes a failure of the LSCS cooling lake dike resulting in the UHS being the remaining source of cooling water to plant safety systems. The UHS provides sufficient cooling water to permit the safe shutdown and cooldown of both LSCS units for 30 days with no makeup from external lake for both normal and accident conditions.

Currently, LSCS TS SR 3.7.3.1 verifies that the cooling water temperature supplied to the plant from the UHS is within the limits of the diurnal curve in TS Figure 3.7.3-1 requiring that maximum initial temperature of the UHS is between 101.25 degrees Fahrenheit (°F) and 104 °F, depending on the time of day. SR 3.7.3.2 verifies that sediment level is less than or equal to 1.5 feet in the intake flume and the CSCS pond, and SR 3.7.3.3 verifies that CSCS pond bottom elevation is less than or equal to 686.5 feet. The UHS is designed to withstand the most severe postulated natural phenomenon. A seismic event could cause the loss of the large cooling lake due to dike failure, but the submerged UHS pond is designed to remain intact.

The DBE for the LSCS UHS is a loss of offsite power (LOOP) on both units resulting in all emergency diesel generators running, while one unit experiences a design-basis accident (DBA) (i.e., a loss-of-coolant accident (LOCA) with LOOP) and the other unit experiences a safe, non-accident shutdown and cooldown. The function of the UHS is to provide cooling of the residual heat removal system heat exchangers, diesel generator coolers, emergency core cooling system cubicle area cooling coils, residual heat removal system pump seal coolers, and low-pressure core spray pump motor cooling coils. The UHS also provides a source of emergency makeup water for the spent fuel pools (SFPs) and can provide water for fire protection equipment.

The CSCS is the safety-related service water system that draws from the UHS. The CSCS draws cooling water from one end of the UHS, performs its design function in the plant, and then discharges to the other end of the UHS. The heated discharge water then migrates or flows to the end of the UHS where the CSCS takes suction. While flowing from the discharge end to the suction end of the UHS, the water absorbs heat energy from the sun and atmosphere and loses heat energy due to evaporation, conduction, convection, and radiant heat effects from the pond surface.

2.2 Description of the Proposed Change

Recent summer meteorological conditions have resulted in the LSCS TS UHS temperature limit being challenged. Therefore, the licensee assessed the current inputs for the current diurnal

curve temperature limits for an acceptable initial UHS temperature within the current accident design basis.

In the LAR, the licensee proposed a TS revision that would allow the UHS supply temperature when in Modes 1-3 to be dependent on the time of day (diurnally dependent) such that the peak post-accident water supply temperature does not exceed 107°F. The licensee has proposed a revision to TS 3.7.3 increasing the required TS temperature limit of the cooling water supplied to the plant from the UHS to vary with the diurnal cycle as shown in Figure 1 below from the blue curve to the red curve by changing the average sediment level limit from 1.5 feet to 6 inches. The blue curve represents the current TS requirements and the red curve is the LAR proposed temperature limits.

The licensee also proposed changes to SR 3.7.3.2 to account for averaging the sedimentation level measurement. SR 3.7.3.2 currently reads, "Verify sediment level is ≤ 1.5 ft in the intake flume and the CSCS pond." The licensee proposed changing SR 3.7.3.2 to read, "Verify average sediment level is ≤ 6 inches in the intake flume and the CSCS pond."

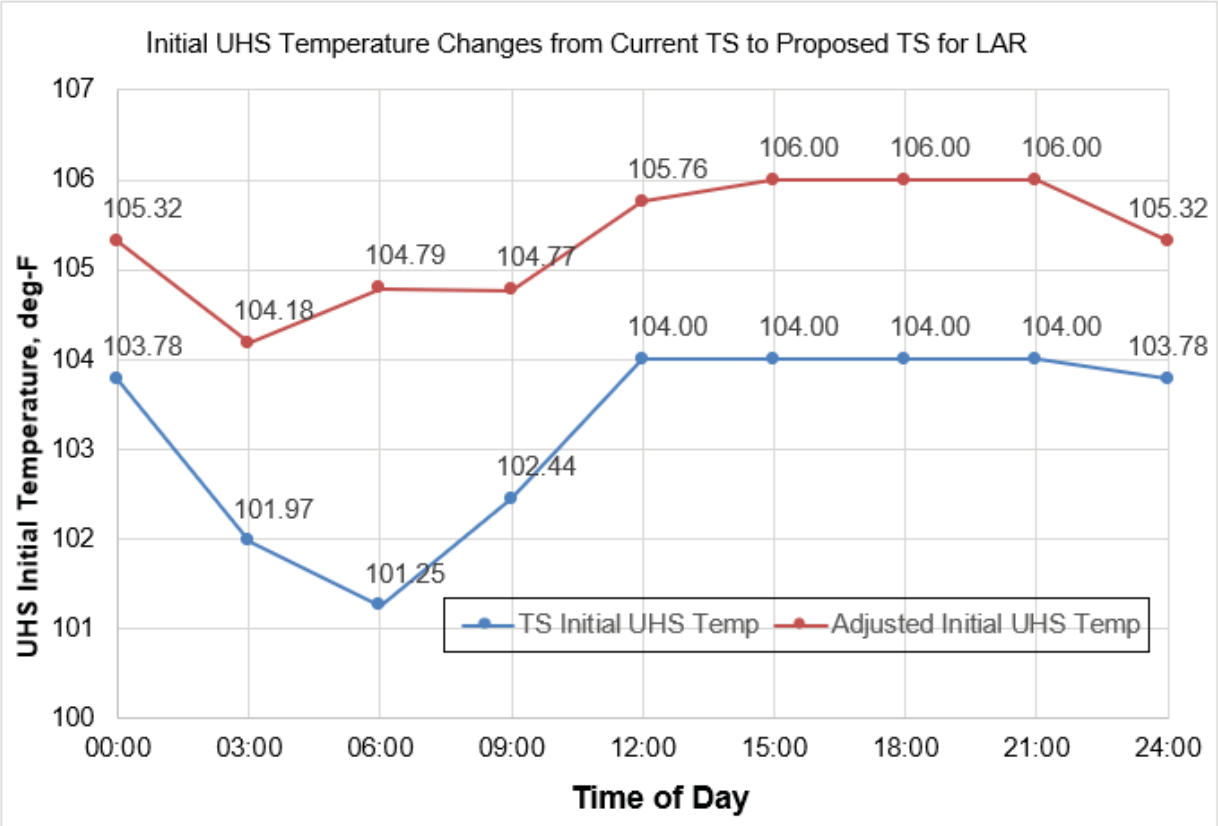

Figure 1 - Initial UHS temperature limits. (The bottom curve shows the current TS Figure 3.7.3-1 UHS temperature limits. The top curve shows the proposed TS Figure 3.7.3-1. UHS temperature limits)

Should the UHS indicated temperature exceed the limits of TS Figure 3.7.3-1, TS 3.7.3 Required Actions C.1 and C.2 would be entered concurrently, requiring both LSCS units to be placed in Mode 3 within 12 hours and Mode 4 within 36 hours.

The licensee also proposed to delete SR 3.7.3.3 verifying that CSCS pond bottom elevation is less than or equal to 686.5 feet and to make a conforming change to Condition A. In addition, changes would be made to TS 3.7.3 to correct a discrepancy with the TS rules of usage by deleting Condition B, modifying the SR 3.7.3.1 Frequency to incorporate the one-hour monitoring frequency, and renumbering existing Condition C as Condition B and existing Required Actions C.1 and C.2 as B.1 and B.2.

Note: The current TS SR 3.7.3.1 could not be performed without starting the existing Required Actions C.1 and C.2.

3.0 REGULATORY EVALUATION

LSCS is designed in accordance with the Appendix A to 10 CFR Part 50, GDC as described in updated final safety analysis report (UFSAR), Revision 24, Chapter 1 (ADAMS Accession No. ML20111A248). The following is a list of GDC applicable to the LAR:

> GDC 2, "Design bases for protection against natural phenomena," related to the system's capability to withstand the effects of natural phenomena, including earthquakes. The site-specific UHS DBE includes a failure of the LSCS cooling lake dike, which results in the UHS pond being the only remaining source of cooling water to plant safety systems. Compliance with GDC 2 is demonstrated by assuming the dike failure resulting from a seismic event.
>
> GDC 5, "Sharing of structures, systems, and components [(SSCs)]," states that SSCs important to safety shall not be shared among nuclear power units unless it can be shown that such sharing will not significantly impair the ability to perform the safety functions, including, in the event of an accident in one unit, an orderly shutdown and cooldown of the remaining units
>
> GDC 13, "Instrumentation and control [(I&C)]," states that instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges.
>
> GDC 44, "Cooling water," states that a system to transfer heat from SSCs important to safety to a 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

NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition," Chapter 18, "Human Factors Engineering," Revision 3 (ADAMS Accession No. ML16125A114), provides the regulatory guidance for human factors engineering (HFE) considerations for applicants.

NUREG-1764, "Guidance for the Review of Changes to Human Actions," Revision 1 (ADAMS Accession No. ML072640413), provides guidance for determining the appropriate level of human factors review and the criteria to be considered for proposed changes to human actions.

The regulations at 10 CFR 50.36(c)(2) state that limiting conditions for operation (LCOs) are the lowest functional capability or performance levels of equipment required for safe operation of the facility, and when an LCO is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the LCO can be met. The regulations at 10 CFR 50.36(c)(3) state that SRs are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met.

The LAR states that the licensee has employed the basis provided in NRC Regulatory Guide (RG) 1.27, "Ultimate Heat Sink for Nuclear Power Plants," Revision 2 (ADAMS Accession No. ML003739969), for the temperature analysis of the LSCS UHS. RG 1.27, Revision 2 was in effect at the time that the most recent LSCS UHS license amendments were issued in 2015. Revision 3 of RG 1.27 (ADAMS Accession No. ML14107A411) is now in effect and has provided to the NRC staff additional guidance on performing UHS analyses and is referenced in the NRC confirmatory analysis section of this safety evaluation (SE).

The regulations at 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," Criterion V, "Instructions, Procedures, and Drawings," require, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances.

4.0 TECHNICAL EVALUATION –PLANT SYSTEMS

4.1 Background

The LSCS UHS temperature follows a diurnal cycle where it warms up during the day and cools off at night. Because of this diurnal cycle, its thermal response following an accident is dependent upon the temperature of the UHS and the time of day when the postulated DBA and failure of the dike occurs.

The current licensing basis of the UHS is in Amendment Nos. 218 and 204 to Facility Operating License Nos. NPF-11 and NPF-18 for LSCS, Units 1 and 2, dated November 19, 2015 (ADAMS Accession No. ML15202A578). The proposed changes in the LAR would revise the TS 3.7.3 limits of the diurnal curve in TS Figure 3.7.3-1 with a maximum from 104 °F to 106 °F. The proposed changes would also modify the sediment level limit specified in SR 3.7.3.2 from "sediment level is ≤ 1.5 ft" to "average sediment level is ≤ 6 inches".

Based on its review of the supplements to the LAR, the NRC staff determined that the findings in the 2015 UHS SE for issuance of Amendment Nos. 218 and 204, with the exceptions of the sediment level and the TS UHS limit figure, are applicable to the current LAR. In the 2015 UHS SE, the NRC staff reviewed the licensee's methodology and assumptions and the results of the analyses and found them to be acceptable. The 2015 UHS SE included the following:

(1) The UHS TS limit of TS Figure 3.7.3-1 with a maximum of 104 °F, including the diurnal cycle;

(2) The UHS sediment level was assumed to be 1.5 ft;

(3) The UHS DBE includes a failure of the LSCS cooling lake dike resulting in the UHS as the remaining source of cooling water to plant safety systems;

(4) The volume of the UHS, used as part of the design bases analyses, was determined utilizing the 1997 Contours Hydrographic Survey, performed by Ocean Surveys, Inc., which determined that the surface area and volume of the UHS was 83.8 acres and 465.4 acre-feet, respectively;

(5) All analyses assume that the cooling lake dike fails instantaneously and concurrently with the DBA LOCA such that only the UHS inventory is assumed to be available to mitigate the accident;

(6) The analyses assume 107 °F as the peak UHS return temperature for safety-related equipment cooled by the UHS;

(7) The SFP analyses include heat loads by operating lineups allowed by procedures to adjust the timing of the SFP heat load;

(8) The UHS water thermal analysis methodology used LAKET-PC code and plug model and wind speed function consistent with NUREG-0693 “Analysis of Ultimate Heat Sink Cooling Ponds” (ADAMS Accession No. ML12146A144), for mass and energy heat transfer water and computational fluid dynamics for fluid flow in the UHS;

(9) Heat transfer in and out of the UHS water include incident shot wave solar radiation, incident long wave atmospheric radiation, long wave back radiation from the lake surface, heat loss due to evaporation, heat loss due to conduction and convection, and heat rejected to the lake by the plant. Other than heat rejected from the plant, the contributing components of heat transfer to/from the UHS are functions of the ambient weather conditions;

(10) Per RG 1.27, the licensee must consider the worst-weather conditions of two weather periods, i.e., the 24-hour period that results in the highest peak temperature of cooling water inlet to the plant and the worst 30 days of weather that result in maximum evaporation to ensure that the UHS will perform its safety function for a minimum of 30 days;

(11) The scenario considered the plant heat load from a DBA LOCA at one unit and a reactor shutdown at the other unit;

(12) The analysis is consistent with NUREG-0800, Section 9.2.5, “Ultimate Heat Sink,” Revision 3 (ADAMS Accession No. ML070550048); and

(13) The calculated peak plant cooling water inlet temperature did not exceed 107 °F, when starting LAKET-PC case runs with the proposed TS limit as presented in TS Figure 3.7.3-1.

Comparing the methodology and assumptions used for the current LAR as described in the supplements to the LAR, dated September 11 and October 22, 2020, with those in the 2015 UHS SE, the NRC staff determined that the licensee’s analysis for the current LAR used the same methodology and assumptions that were evaluated in the 2015 UHS SE with the exceptions of Items (1) and (2) above (i.e., the TS Figure 3.7.3-1 and the UHS sediment level).

4.2 Review of Meteorological Data

During a clarification call on August, 25, 2020, regarding the NRC staff's request for supplemental information needed to complete the acceptance review of the current LAR, the NRC staff requested that the licensee reconcile the weather information to verify that the weather conditions used for the 2015 UHS SE are still bounding.

The licensee clarified in the supplement to the LAR, dated September 11, 2020, that the weather data used were for the dates from 1948 through 2010. The worst 24-hour weather period was determined to be from July 24, 2001, 7:00 AM to July 25, 2001, 6:00 AM, and the worst 30-day weather period was determined to be from July 21, 1995, to August 22, 1995. The worst 30-day evaporation weather period remains June 18, 1954, to July 18, 1954.

The licensee in its supplemental submission dated September 11, 2020, stated that it re-reviewed the meteorological data from Peoria International Airport from October 1, 2010, to August 1, 2020, and did not identify any periods that create weather conditions worse than the previously used data, which contains 62 years of meteorological data. The licensee concluded that it was unlikely that the addition of 9 years of meteorological data would produce different results.

The NRC staff did not identify any worst data after 2010, except to note that there is a long-term trend in rising water temperatures that justifies the need for new TSs concerning water temperature limits. Based on this information, the NRC staff finds that the data used in the 2015 UHS SE remain bounding weather conditions for the current LAR.

4.3 Changes in SR 3.7.3.2 and Deletion of SR 3.7.3.3

UHS Volume

In its July 17, 2020, submission, the licensee stated that the volume of the UHS used as part of the design bases analyses was determined utilizing the 1997 Contours Hydrographic Survey, performed by Ocean Surveys, Inc. The surface area and volume of the UHS was 83.8 acres and 465.4 acre-feet, respectively. In the UHS transient analysis, 1.35 acre-feet is subtracted from the UHS volume to account for fire-fighting measures. Additionally, due to the Y-shape of the UHS, a portion of the UHS is stagnant during accident conditions due to the flow patterns from where the water enters the UHS and travels back to the intake. This results in an effective surface area and volume of 48.52 acres and 293.89 acre-feet, respectively.

Effects of Sedimentation Level

The licensee stated in its July 17, 2020, application that the three most recent sedimentation surveillances were reviewed. These surveillances were completed in 2014, 2016, and 2018. The surveillances results indicate that the average sedimentation depth is less than 6 inches and that changes since the baseline survey in 1997 have been insignificant. While there are localized peaks and valleys within the UHS in excess of 6 inches, the average sedimentation depth remains unaffected. The reduction in sediment level results in an increase in UHS effective volume of 24 percent, which decreases UHS temperature response due to the increased volume.

In response to an NRC request for additional information (RAI), by letter dated April 16, 2021, the licensee clarified that when the surveys were performed previously, the actual sediment

levels were considered as the “bottom” of the UHS, effectively re-baselining the UHS volume. The level of the bottom of the UHS varies, becoming progressively deeper as it approaches the lake intake structure. More recent hydrographic surveys have taken soundings of the bottom at multiple locations which are referenced to the baseline study and yield the localized depth of accumulated sediment as well as the average sediment depth. Data from the surveys are used to determine the volume. As stated in the TS Bases for SR 3.7.3.2, sediment level is determined by a series of sounding cross-sections compared to as-built soundings. Therefore, SR 3.7.3.3, which verifies the bottom elevation, provides marginal value in the assessment of UHS volume and capability and is proposed to be deleted since the average siltation level provides the available UHS volume required for heat removal of design basis loads.

Based on the above, the NRC staff determined that the proposed removal of SR 3.7.3.3, and the conforming change to Condition A, is acceptable because the proposed revision of SR 3.7.3.2 to verify average sediment level of less than or equal to 6 inches provides adequate assurance of the effective water volume of the UHS. Therefore, the proposed removal of SR 3.7.3.3, along with the proposed revision of SR 3.7.3.2, satisfies the requirement of 10 CFR 50.36(c)(3) for surveillance requirements to assure that facility operation will be within safety limits and that the LCOs will be met.

4.4 Changes in SR 3.7.3.1

The LAR states that TS 3.7.3 is proposed to be modified to address a discrepancy with the TS rules of usage. Specifically, Condition B of TS 3.7.3 is proposed to be deleted and the SR 3.7.3.1 Frequency is proposed to be revised to capture the performance of SR 3.7.3.1 (i.e., once per hour) that is directed by Condition B of TS 3.7.3. This is an administrative change that maintains the intent of conditions that require the performance of the SR. With the proposed change, SR 3.7.3.1 would continue to be performed when CSCS pond supply temperature is ≥ 101°F, in addition to the existing Frequency provided in the surveillance frequency control program. This change is needed because, as required by LCO 3.0.2, Required Actions of the associated Conditions are only required to be met upon the discovery of a failure to meet an LCO. LCO 3.7.3 requires the CSCS pond to be operable. The CSCS pond can be within the limits of TS Figure 3.7.3-1 at certain times with a temperature ≥ 101 °F and remain operable. However, in this scenario, LCO 3.0.2 would not require entry into Condition B because the CSCS pond remains operable. The proposed change ensures the performance of SR 3.7.3.1 once per hour with CSCS pond temperature ≥ 101 °F.

Based on the above, the NRC staff finds the proposed changes to TS 3.7.3 and SR 3.7.3.1 to be acceptable because they are administrative changes that retain the intent of the TSs and continue to satisfy 10 CFR 50.36(c)(3). The proposed changes to renumber existing Condition C as Condition B and existing Required Actions C.1 and C.2 as B.1 and B.2 are also administrative changes that are necessary because of the proposed changes to TS 3.7.3 and SR 3.7.3.1 and are, therefore, acceptable.

4.5 Changes in TS Figure 3.7.3-1

In the 2015 UHS SE, the NRC staff found acceptable the current LSCS TS Figure 3.7.3-1 (i.e., the lower curve in Figure 1 of this SE) of UHS temperature limit corresponding to the maximum sediment level of 1.5 ft. In Attachment 1, Section 7.1.5, of the LAR supplement dated October 22, 2020, the licensee performed a sensitivity study of UHS temperature under different sediment levels using its computer code LAKET-PC. The analysis incorporated the weather conditions from January 1995 to September 2010 from LSCS and analyzed the UHS design

basis temperature transient based on 3559 Megawatt heat load rejected to the UHS and weather data selection based on RG 1.27, Revision 2. Using the diurnally dependent initial UHS temperature, the resulting peak UHS temperature was less than 107 °F for all the cases.

By analyzing the results of the analysis, the LAR and its supplement, dated October 22, 2020, showed that the reduction of sediment level reduced UHS temperature response (i.e., the difference between starting and peak temperatures), due to the increased water volume. Table 1 below shows this transient heat-up data, where the transient heat-up is the difference between the starting and peak temperatures. However, for time steps between 3:00 AM and 12:00 noon, the licensee's data show that the temperature response drops with the lower sedimentation level, which is consistent with NRC staff expectations.

Table 1. Transient heat-up comparison between licensee's analyses for 18 inches and 6 inches of sediment

Time	Transient Heat-Up (°F)		Change in Temperature Response with Drop in Sediment Level (°F)
	18 inches	6 inches	
00:00	0.00	0.68	0.68
03:00	3.03	1.82	−1.21
06:00	4.15	1.21	−2.94
09:00	2.12	1.23	−0.89
12:00	0.30	0.24	−0.06
15:00	0.00	0.00	0.00
18:00	0.00	0.00	0.00
21:00	0.00	0.00	0.00

Using an upper temperature limit of 107 °F, with a 0.75 °F allowance for instrument uncertainty and a 0.25°F additional margin, and the transient heat-up temperature corresponding to 6-inch sediment from Table 1, the licensee obtained the proposed TS Figure 3.7.3-1 UHS diurnal curve (upper red curve in Figure 1 of this SE). The licensee clarified in the RAI response dated April 7, 2021, that 0.25 °F is an operationally convenient discretionary adjustment factor, or margin. The NRC staff agrees that this 0.25 °F is not a required margin and finds it acceptable as an added conservatism.

The licensee adjusted UHS temperature corresponding to the average sediment level of 6 inches to obtain the proposed TS Figure 3.7.3-1 (i.e., the upper red curve in Figure 1 of this SE) using the following expression:

> (maximum peak cooling water temperature) – (transient heat-up rate) – (instrument uncertainty) – (0.25°F adjustment) = (adjusted initial UHS temperature)

For example, in the case of the 06:00 time step, the transient heat-up at 6 inches is 1.21 °F and the proposed TS limit is calculated as follows:

> 107 °F – 1.21 °F – 0.75 °F – 0.25 °F = 104.79 °F

Based on its analysis, the licensee determined the upper UHS temperature limit to be 107 °F for all cases.

The NRC staff reviewed compliance with the applicable GDC requirements by examining the assumptions used in the licensee's analyses. The NRC staff determined that compliance with GDC 2 was demonstrated by assuming a dike failure resulting from a seismic event; compliance with GDC 5 was demonstrated by using the combined heat loads from an accident at one unit and a reactor shutdown at the other unit; and compliance with GDC 44 was demonstrated by incorporation of the DBA heat load. Therefore, the NRC staff finds that the proposed changes in TS Figure 3.7.3 1 are consistent with the NRC's GDC.

4.6 The NRC Staff's Confirmatory Analysis

The NRC staff's confirmatory analysis focused on determining the peak UHS return temperature under bounding meteorological and DBA-LOCA conditions. The confirmatory analysis used computer code LAPLUG21, the assumption of 6-inch average sediment, and the design inputs provided by the licensee, including meteorological data, plant discharged heat, computational fluid dynamics results, and physical parameters of the UHS.

In the confirmatory analysis, the NRC staff examined the licensee's analyses of the peak return water temperature from the UHS at the LSCS site. The confirmatory analysis confirmed that the peak UHS return water temperature would be within the temperature limit of 107 °F for the plant equipment cooled by the UHS, and that the proposed temperature limits for TS 3.7.3 are acceptable. Specifically, for the worst-case starting of the LOCA event at 12:00 noon of the worst-day in the 15-year period from 1995 to 2010, assuming the initial UHS temperature of 105.76 °F based on the diurnal curve TS limit of Figure 1, the calculated UHS temperature would exceed 106 °F for a duration of 4-5 hours and briefly reach a peak of 106.29 °F, which is below the temperature limit of 107 °F.

Conservatism in the NRC Staff's Confirmatory Analysis

The highest temperature on the licensee's proposed TS diurnal curve is 106 °F (see Figure 1 of this SE). The 106 °F limit is important to the non-safety-related equipment such as SFP cooling equipment. The SFP cooling equipment is not safety-related, but it is important to safety and is subject to protection from high temperature cooling water. Item (7) of Section 4.1 above explains how this was resolved even with the more limiting temperature (106 °F versus 107 °F). However, the licensee evaluated the LSCS safety-related equipment to 107 °F. The licensee accounts for this difference (107 °F versus 106 °F) by including a 0.25 °F adjustment factor and a 0.75 °F instrument uncertainty, as discussed above.

The NRC staff's independent modeling showed results for maximum UHS intake temperature slightly exceeding the 106 °F criterion by an estimated 0.29 °F in the worst-case. However, the confirmatory analysis includes several conservatisms that reduce this exceedance to an insignificant, and therefore acceptable, value.

The licensee's meteorological data are conservative. The conservatisms were estimated for dry-bulb temperature (about 2 °F lower), dew point (about 1.5 °F lower), and wind speed (about 7 percent higher). Adjusting these parameters of dry-bulb temperature, dew point, and wind speed, resulted in only a small decrease in peak temperature for the worst year from 106.29 °F to 106.20 °F.

The confirmatory analysis used a value for the Adams wind function[1] based on the entire cooling lake area (2,057 acres), which is conservative. The Adams wind speed function is more conservative (pessimistic) than the Ryan-Harleman wind speed function used in the licensee's model. However, the NRC staff believes that the Adams formulation better represents forced convection and conduction processes in this case. The greatest part of the difference between the licensee's and the confirmatory analysis' results is the difference in the wind speed functions used. Tests using the Ryan-Harleman formula instead of Adams, along with the previously stated conservatisms in meteorological parameters, resulted in a peak intake temperature for the worst year of 106.13 °F, compared to 106.29 °F.

Additional Conservatisms in the Licensee's Assumptions

In its RAI response, dated April 7, 2021, the licensee stated the following regarding other conservatisms:

1. The presence of wind and air movement above the water is a primary driver in heat transfer from the UHS. Wind sensitivity studies have shown that when the UHS water surface temperature exceeds 100°F, unstable atmospheric conditions will exist over the UHS. Consequently, the wind coefficients will remain less than 0.3 for all hours of the day which is shown to reduce the maximum UHS temperature by 1°F for 18-inch sediment levels. Since the temperature is the driving force in these studies, the same results may be applied to the UHS with initial temperatures up to two degrees higher.

2. The accident energy deposited in the UHS is based on decay heat generated by 3559 [megawatt thermal] for each unit. Additionally, 105 [percent] of the sensible heat from both reactors is conservatively assumed to be deposited in the UHS.

3. No thermal losses are assumed from the buried piping extending from the UHS to the plant (i.e., three 36 inch lines, one 30 inch line, and two 14 inch lines, each approximately 1000 feet in length). Likewise, no thermal losses are assumed from the buried piping from the plant returning to the UHS (i.e., two 48 inch lines and one 20 inch line[] each approximately 5000 feet in length).

4. All [CSCS] and Emergency Core Cooling System (ECCS) pumps are assumed to operate during the entire 30-day post [DBE] period. All pump brake-horsepower is assumed to be continuously deposited into the UHS.

The above conservatisms in the licensee's assumptions are carried over into the NRC staff's confirmatory analysis. The NRC staff's confirmatory analysis using LAPLUG21 code and the Adams wind function throughout provides an independent check to the licensee's analysis. The confirmatory analysis predicts slightly higher temperature increases to the UHS under accident conditions than the licensee's analysis with sufficient conservatism.

In light of the results of the NRC staff's confirmatory analysis and the conservatisms discussed above, the NRC staff determined that the proposed TS Figure 3.7.3-1 for UHS temperature TS limit is acceptable. Therefore, the NRC staff finds that the requirement of 10 CFR 50.36(c)(2) for LCOs is satisfied by TS LCO 3.7.3 and the TS limit of proposed TS Figure 3.7.3-1. Should

[1] Adams, E., D.J. Cosler, and K.R. Helfrich, Water Resources Research. Volume 25, No 3, pp 425–435. "Evaporation from Heated Water Bodies: Predicting Combined Forced Plus Free Convection," dated March 1990.

the LCO not be met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the LCO can be met.

NRC Staff Qualitative Analysis with Realistic Initial Temperatures

While the LAR was not submitted following the guidance for a risk-informed application, the NRC staff performed a qualitative analysis related to the risk of reaching the 107 °F limit. The results of this qualitative analysis are not used for confirmatory analysis, but rather to provide additional information for the conservatism discussion.

The NRC staff's qualitative analysis considered the more realistic scenario that UHS starting temperatures are determined by temperatures in the cooling lake over the period from 1948 through 2010 during normal plant operation without using the proposed diurnal curve. Since the UHS pond is a submerged basin near the plant's intake for circulating water during normal operation, the starting temperature of the UHS pond would be determined by the cooling lake temperature at the initiation of the event. The heat rejection rates are estimated from the difference between the full-power thermal ratings of the reactors and the monthly electricity generating rate for the worst month over the period in August 2010. Flow (with associated heat) rates being discharged to the lake are chosen to be the expected values for full-power operation. Other parameters such as lake area and volume are the same as those used in the licensee's study of measured cooling lake temperatures. The calculated results show that the modeled temperatures at the intake of the cooling lake would remain below 102 °F for the period covered by the data. This is well below the measured data and the 104.18 °F of the lower limit of the proposed diurnal curve.

Further, adding DBA heat load and assuming 6 inches of sediment and the starting temperatures of the calculated cooling lake temperature discussed above, the calculated realistic UHS intake temperatures are predicted to be less than 103.14 °F for the meteorological data from 1948 through 2010.

The results of the NRC staff's qualitative analysis using more realistic cooling lake temperatures as the initial temperatures suggest that the licensee's proposed diurnal curve is not likely to be invoked because peak UHS intake temperatures are realistically predicted to reach only 103.14 °F, which is below the lower limits of the proposed curve for the TS limit and below the limit of 107 °F for the safety-related equipment cooled by the UHS with substantial margin.

4.7 Conclusion – Plant Systems

Based on the above, the NRC staff determined that the licensee's analysis is consistent with the regulatory guidelines of RG 1.27 and NUREG-0800, Section 9.2.5, and that there is reasonable assurance that under the proposed UHS temperature limit as shown in TS Figure 3.7.3 1 the peak UHS return temperature will be less than 107 °F under accident conditions. Therefore, the NRC staff concludes that there will be margin to the temperature limits for the equipment and plant components cooled by the CSCS and UHS and that the licensee's proposed TS changes comply with the requirements of GDC 2, GDC 5, GDC 44, 10 CFR 50.36(c)(2), and 10 CFR 50.36(c)(3) and, thus, are acceptable.

5.0 TECHNICAL EVALUATION – I&C

The NRC staff's review of I&C focused on determining whether the TSs, as amended, would provide reasonable assurance of adequate protection of public health and safety in conditions

where the UHS is relied upon, as it relates to I&C. Specifically, the staff reviewed the application as it relates to the effects of changing the TS limit on the UHS inlet temperature to follow the proposed TS Figure 3.7.3-1 diurnal curve values.

The LAR provides the following equation as the basis for proposed TS Figure 3.7.3-1:

> *Maximum peak cooling water temperature – Transient Heat-up Rate – Instrument Uncertainty – 0.25 °F adjustment = Adjusted Initial UHS Temperature*

Portions of this calculation have been previously evaluated and approved by the NRC, as documented in the NRC staff's 2015 UHS SE. The proposed maximum TS allowable initial UHS temperature, as shown on the diurnal curve, is 106 °F and occurs at 15:00 to 21:00 hours. The evaluations and assumptions by the licensee are still bounded since the analyzed limiting initial UHS temperature is unchanged at 107 °F. In its April 7, 2021, response to an NRC RAI, the licensee stated that the instrument uncertainty factor is unchanged and remains at 0.75°F. The instrument uncertainty of 0.75 °F bounds the single-channel uncertainty of not more than 0.74 °F, and the two-channel uncertainty of not more than 0.53 °F. The licensee did not provide an analysis of the uncertainty when three or all four channels are operable, but the NRC staff recognizes that it would be bounded by and less than the two-channel value of not more than 0.53 °F. The NRC staff notes that normal operation would have four channels operable and that with any combination of more than a single channel operable, the instrument uncertainty would be lower than the analyzed 0.75 °F and would provide additional margin. However, the licensee did not take any credit for this additional margin.

In its July 17, 2020, application, the licensee proposed a change in the adjustment factor from 0.42 °F to 0.25 °F. The NRC staff confirmed that the adjustment factor is an additional discretionary margin to provide conservatism over and above the calculated instrument uncertainty. This margin will be larger when two or more channels are in operation, which will provide additional margin. However, the licensee did not take any credit for this additional margin.

Based on the above, the NRC staff confirmed that the calculated instrument uncertainty remains unchanged, using the same calculation methodology, and that the analysis is still bounded with the proposed initial UHS temperatures. Additionally, the proposed adjustment factor provides acceptable conservatism in the total uncertainty calculation. Therefore, the staff finds that these changes are acceptable. The staff also finds that these changes continue to provide the instrumentation to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety and appropriate controls to maintain these variables and systems within prescribed operating ranges. Therefore, the staff finds that these changes will continue to meet the requirements of 10 CFR Part 50, Appendix A, GDC 13, "Instrumentation and control."

6.0 TECHNICAL EVALUATION – HUMAN FACTORS ENGINEERING (HFE)

6.1 HFE Considerations

The NRC staff used the guidance in NUREG-0800, Chapter 18 while reviewing HFE considerations.

6.1.1 Review of Changes to Human Actions

The NRC staff determined that the licensee's proposed changes to SR 3.7.3.2 constituted a change to the human actions used to verify the operability of the UHS.

NUREG-0800, Chapter 18 indicates that, for requests associated with important human actions, applicable acceptance criteria contained in NUREG-1764 should be met. NUREG-1764 provides guidance for determining the level of HFE review required for such requests and the HFE criteria to be considered while completing the NRC staff's evaluation.

The following paragraphs discuss the NRC staff's review of the licensee's application, as supplemented, in accordance with the guidance in NUREG-1764.

Initial HFE Estimate of the Warranted HFE Review Level

In considering the proposed changes to the LSCS TSs, the NRC staff utilized the Estimated Importance Method discussed in Section 2.4.3.1 of NUREG-1764.

The NRC staff considered a bounding scenario in which the site service water system is lost and is not recovered. Specifically, the staff considered the basic event of a failure to recover the service water system, as modeled in the LSCS standardized plant analysis of risk (SPAR) model. The staff determined that this operator action represented a very low contributing factor in the overall risk profile of the plant. Based on the risk achievement worth and Fussel-Vesely risk-importance measures determined using the SPAR model, the staff concluded, as an initial estimate, that the licensee's proposed change to SR 3.7.3.2 warranted a Level-III (minimal) review.

Qualitative Assessment of Human Action Safety-Significance

In accordance with Section 2.3.5.1 of NUREG-1764, the NRC staff determined that the licensee's submittal warranted a qualitative assessment of: (1) personnel functions and tasks and (2) design support for task performance. In conducting this assessment, the staff determined the following factors to be applicable:

- Change in Tasks: Has the requested change significantly modified the way in which personnel perform their tasks?

- Change in Procedures: Has the requested change significantly changed the procedures that personnel use to perform the task?

Licensee Discussion of Tasks and Procedures

The licensee's submittal discusses the modification of SR 3.7.3.2 to provide a verification that average sediment level is within specified limits (6 inches), as opposed to the verification that maximum sediment level is below a specified value (1.5 feet).

The current TS Bases for SR 3.7.3.2 state, in part:

> This SR ensures adequate long term (30 days) cooling can be maintained, by verifying the sediment level in the intake flume and the CSCS pond is ≤ 1.5 feet.

The LAR indicates that this statement would be revised to state, in part:

> "This SR ensures adequate long term (30 days) cooling can be maintained, by verifying the average sediment level in the intake flume and the CSCS pond is ≤ 6 inches."

This revision reflects the proposed change to the methodology for performing the surveillance.

The TS Bases for SR 3.7.3.2 also state the following:

> Sediment level is determined by a series of sounding cross-sections compared to as-built soundings.

This description of the measurement method would remain unchanged.

NRC Staff Determinations

Based on the information provided in the licensee's application regarding the TS Bases for SR 3.7.3.2, the NRC staff determined that the methodology for collecting information for the surveillance would continue to entail the same human actions. Specifically, licensee personnel would continue to perform the surveillance by conducting a series of sounding cross-sections to measure depth in the CSCS pond. The only actual change expected with the new methodology would be that the sounding cross-section measurements would be used to calculate an areal average of sediment deposition, as opposed to being used to identify the maximum deposition at any given point. The NRC staff determined that this change in calculation methodology does not constitute a significant modification of the way in which personnel perform the task.

The procedures used to conduct the surveillance would likely need to be changed based on the new methodology for the surveillance. However, the NRC staff determined that any procedure changes are not expected to significantly alter the way that tasks are performed. Instructions for performing sounding cross-sections are not expected to be impacted, and the only considerable procedure change anticipated would be associated with the calculation of averaged areal density, based on the depths measured throughout the CSCS pond.

Additionally, the procedures used to conduct the surveillance would continue to be developed under the licensee's quality assurance program, administered in accordance with 10 CFR Part 50, Appendix B. In accordance with Criterion V of this appendix, instructions/procedures appropriate to the circumstances will continue to be required for performance of the surveillance.

Integrated Assessment

In accordance with Section 2.4.5 of NUREG-1764, based on the determinations from the qualitative assessment (discussed above), the NRC staff considered whether the licensee's request warranted an elevation of the level of the HFE review.

Because the proposed changes do not constitute a significant modification of the tasks required for the completion of the associated surveillance, and because any associated procedure changes are not expected to be significant and would continue to be developed in accordance with the requirements of the licensee's quality assurance program, the NRC staff determined

that there was no basis to elevate the level of warranted HFE review determined by the initial estimate. Therefore, the staff proceeded with a Level-III review.

General Deterministic Review

In accordance with Section 2.5 of NUREG-1764, as part of the NRC staff's Level-III review, the staff verified that current regulations would still be met with the proposed change in place. As discussed in Section 3.0 of this SE, 10 CFR 50.36(c)(3) requires that TSs include surveillance requirements to assure that the necessary quality of systems and components is maintained. The licensee's request changes constitute a change to the SRs associated with the LSCS UHS; however, based on the staff's determination that the proposed revised SR would still provide reasonable assurance that the UHS can fulfill its safety function (as discussed in Section 4.7 of this SE), the requirement of 10 CFR 50.36(c)(3) will still be met.

6.1.2 Proposed Administrative Changes to SR 3.7.3.1 and LCO 3.7.3

The LAR discusses the requirement to perform SR 3.7.3.1 (verifying cooling water temperature is within specified limits) once per hour when CSCS pond temperature is found to be ≥ 101 ˚F. The licensee intends to convert this requirement from being an action in LCO 3.7.3, to including the requirement as a stipulation in the Frequency column for SR 3.7.3.1. The licensee states that this move constitutes an administrative change, intended to eliminate a conflict with the stipulation listed in LCO 3.0.2 that required that actions listed for LCOs need only be performed when the LCO itself is not met (i.e., when the associated system is inoperable).

The NRC staff considered the human performance aspects of this proposed change and determined that there would be no substantial impact on operator performance associated with this requirement. As discussed in the TS, SR 3.7.3.1 will continue to be performed in accordance with the surveillance frequency control program. During regular-frequency performance of SR 3.7.3.1, operators will still have the opportunity to identify if conditions are present that require an increase in surveillance frequency (i.e., CSCS pond temperature ≥ 101 ˚F). Because increased frequency of the performance of SR 3.7.3.1 will still be controlled by TSs, and because there will be no substantial impact on how/when operators will determine that increased frequency of monitoring is necessary, the NRC staff finds this proposed administrative change to be acceptable.

6.1.3 Conclusion – HFE

The NRC staff considered HFE aspects of the licensee's request to modify LSCS TSs for the UHS. The NRC staff determined that the proposed changes will not adversely impact the licensee's ability to complete the human actions associated with monitoring sediment buildup or temperature in the CSCS pond. Based on this determination, and the fact that the procedures governing this monitoring will still be controlled in accordance with the licensee's quality assurance program and the requirements listed in 10 CFR Part 50, Appendix B, the NRC staff determined that there is reasonable assurance that the licensee will continue to be able to effectively complete the affected TS SRs. Based on this determination, the NRC staff concludes that the proposed license amendment is acceptable, with regards to HFE considerations.

7.0 TECHNICAL EVALUATION - NRC STAFF RISK INSIGHTS

The licensee's application is not a risk-informed submittal and the licensee did not include risk insights in the submittal. However, the NRC staff considered information from NRC's LSCS SPAR model to provide insights on the risk impact of the proposed licensing action and to inform the review scope. The NRC staff's review of the SPAR model was used to determine whether the proposed changes were associated with dominant risk contributors to either failure of SSCs or risk significant human actions. The NRC staff's review of the SPAR model showed that the proposed changes were not considered risk significant because the proposed changes: (1) do not increase the likelihood of events that could challenge normal plant operations and successful mitigation, (2) do not increase the likelihood of common cause failures, (3) do not increase the likelihood of events that would trigger abnormal operating procedures and emergency operating procedures, and (4) do not increase the likelihood of failures or unavailability of SSCs caused by human inaction or inappropriate actions or result in new credible HFE. In addition, the proposed changes do not challenge the availability or the reliability of the UHS or any of the associated SSCs. For these reasons, the proposed changes appear to be risk neutral and the NRC staff did not pursue a detailed review of risk information.

8.0 TECHNICAL EVALUATION – CONCLUSION

Based on the above, the NRC staff concludes that with the proposed changes, there continues to be reasonable assurance that all the applicable regulatory and technical requirements are satisfied.

9.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois State official was notified of the proposed issuance of the amendments on June 3, 2021. The State official had no comments.

10.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and change SRs. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission issued a proposed finding that the amendments involve no significant hazards consideration on December 1, 2020 (85 FR 77274). No public comments were submitted on this finding.

Pursuant to 10 CFR 51.21, 51.32, and 51.35, the Commission issued an environmental assessment and finding of no significant impact in the *Federal Register* on March 12, 2021 (86 FR 14158). Accordingly, based upon the environmental assessment, the Commission has determined that the issuance of these amendments will not have a significant effect on the quality of the human environment.

11.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2 - ISSUANCE OF AMENDMENT NOS. 250 AND 236 TO RENEWED FACILITY OPERATING LICENSES RE: A LICENSE AMENDMENT TO TECHNICAL SPECIFICATION 3.7.3, "ULTIMATE HEAT SINK (UHS)" (EPID L-2020-LLA-0165) DATED JULY 13. 2021

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GCurran, NRR/SCPB
LChang, NRR/SCPB
DNold, NRR/SCPB
CTilton, NRR/STSB
JWilson, NRR/STSB
CCheung, NRR/EICB
GSingh, NRR/EICB
RBeaton, NRR/SNSB
SVasavada, NRR/APLC
MValentin-Olmida, NRR/APLC
JVazquez, NRR/IOLB

ADAMS Accession No. ML21158A228 ***by email**

OFFICE	NRR/DORL/LPL3/PM *	NRR/DORL/LPL3/LA *	NRR/DSS/STSB/BC *	NRR/DSS/SCPB/BC *
NAME	BVaidya	SRohrer	NJordan	BWittick
DATE	06/08/2021	06/08/2021	06/13/2021	06/11/2021
	NRR/DSS/SNPB/BC *	NRR/DRO/IOLB/BC *	NMSS/REFS/ERLRB/BC *	NRR/DRA/APLC/BC *
	SKrepel	CCowdrey (BGreen (A))	RElliott	SRosenberg
	06/09/2021	06/14/2021	06/10/2021	06/08/2021
OFFICE	NRR/DEX/EICB/BC *	OGC *	NRR/DORL/LPL3/BC *	NRR/DORL/LPL3/PM *
NAME	MWaters	JWachutka	NSalgado	BVaidya
DATE	06/08/2021	6/25/2021	07/13/2021	07/13/2021

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