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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

LaSalle County Station, Units 1 and 2
Facility Operating License Nos. NPF-11 and NPF-18
NRC Docket Nos. 50-373 and 50-374

Subject: Response to LaSalle County Station, Units 1 and 2 – Denial of License Amendment

References:

1. Letter from K. R. Jury (Exelon Generation Company, LLC) to U.S. NRC, "Request for a License Amendment to Technical Specification 3.7.3, Ultimate Heat Sink," dated March 13, 2006
2. U. S. NRC to C. M. Crane (Exelon Generation Company, LLC), "LaSalle County Power Station, Units 1 and 2 – Request for Additional Information Related to Ultimate Heat Sink License Amendment Request," dated June 15, 2006
3. Letter from J. A. Bauer (Exelon Generation Company, LLC), "Additional Information Supporting the License Amendment Request to Technical Specification 3.7.3, 'Ultimate Heat Sink'," dated July 13, 2006
4. Letter from D. M. Benyak (Exelon Generation Company, LLC), "Additional Information Supporting the License Amendment Request to Technical Specification 3.7.3, 'Ultimate Heat Sink'," dated August 4, 2006
5. U. S. NRC to C. M. Crane (Exelon Generation Company, LLC), "LaSalle County Station, Units 1 and 2 – Denial of License Amendment," dated November 3, 2006

In Reference 1, Exelon Generation Company, LLC, (EGC), requested an amendment to Appendix A, Technical Specifications (TS), of Facility Operating License Nos. NPF-11 and NPF-18 for LaSalle County Station (LSCS) Units 1 and 2 respectively. Specifically, the proposed change was to increase the temperature limit of the cooling water supplied to the plant from the Core Standby Cooling System (CSCS) pond (i.e., the Ultimate Heat Sink (UHS)) from ≤ 100°F to ≤ 101.5°F. This increase was to be achieved by reducing the temperature

measurement uncertainty by replacing the existing thermocouples with higher precision temperature measuring equipment.

In Reference 2, and in subsequent teleconferences, the NRC requested additional information to complete the review of the proposed license amendment. In References 3 and 4, EGC provided the additional information requested. The NRC subsequently concluded that the amendment request (i.e., Reference 1) could not be approved. A notice of the denial with an enclosed Safety Evaluation (SE) was transmitted to EGC on November 3, 2006 (i.e., Reference 5).

EGC reviewed all NRC applicable correspondence related to the UHS submittal. Each issue in the SE in Reference 5 was reviewed for technical accuracy by three separate qualified engineers and an external industry subject matter expert. The conclusion of the reviewers was that the UHS license amendment was technically accurate, in accordance with industry standards, and in conformance with the current LSCS licensing and design basis.

A summary of our review is provided in Attachment 1.

EGC believes that with this denial, the NRC is challenging the current design and licensing basis of the LSCS Circulating Water (CW) system. Furthermore, it is EGC's position that the technical basis for the denial, as described in the SE, represents a change in the NRC position on the appropriate measurement uncertainty methodology to be applied to non-safety related, indication only instrumentation, and is inconsistent with UHS instrumentation applications previously reviewed and approved by the NRC that are currently part of the LSCS licensing basis.

A backfit analysis request is under EGC consideration; however, in the interest of moving forward with this licensing action, EGC has requested a face-to-face meeting with the NRC on January 26, 2007, to discuss the optimum approach for a resubmittal of this license amendment request. In addition, due to the generic industry implications of this newly articulated NRC position that does not appear consistent with the initial UHS design approval, EGC is also requesting that the issue be resolved generically within the industry.

Should you have any questions concerning this letter, please contact Ms. Alison Mackellar at (630) 657-2817.

Respectfully,

Darin M. Benyak
Manager – Licensing

**ATTACHMENT 1**
**Comments on Denial of License Amendment**

Overview and Background

In Reference 1, Exelon Generation Company, LLC, (EGC), requested an amendment to Appendix A, Technical Specifications (TS), of Facility Operating License Nos. NPF-11 and NPF-18 for LaSalle County Station (LSCS) Units 1 and 2 respectively. Specifically, the proposed change was to increase the temperature limit of the cooling water supplied to the plant from the Core Standby Cooling System (CSCS) pond (i.e., the Ultimate Heat Sink (UHS)) from ≤ 100°F to ≤ 101.5°F. This increase was to be achieved by reducing the temperature measurement uncertainty by replacing the existing thermocouples with precision temperature measuring equipment.

In Reference 2, and in subsequent teleconferences, the NRC requested additional information to complete the review of the proposed license amendment. In References 3 and 4, EGC provided the additional information requested. The NRC subsequently concluded that the amendment request (i.e., Reference 1) could not be approved. A notice of the denial with an enclosed Safety Evaluation (SE) was transmitted to EGC on November 3, 2006 (i.e., Reference 5).

Denial of License Amendment for UHS Analysis

The notice of denial (i.e., Reference 5) documented that the NRC found the requested license amendment unacceptable due to:

1. "the degree of measurement accuracy that would be required to support the requested modification is not adequately demonstrated in Exelon's analysis, and

2. the TS modification itself does not adequately address single-unit operation (if only one unit is operating, the lack of flow to the other unit could cause the temperature measurements associated with that unit to become non-representative of the UHS temperature.)"

EGC Response to Statement 1

Statement 1:

> "the degree of measurement accuracy that would be required to support the requested modification is not adequately demonstrated in Exelon's analysis,"

EGC reviewed all NRC applicable correspondence related to the UHS submittal. Each issue in the SE in Reference 5 was reviewed for technical accuracy by three separate engineers with instrumentation-related expertise, and an external industry subject matter expert. The conclusion of the reviewers was that the UHS license amendment was technically accurate, in accordance with industry standards, and in conformance with the current LSCS licensing and design basis.

Reference 5 discusses Regulatory Guide (RG) 1.105, "Instrument Setpoints for Safety Related Systems," (i.e., Reference 7) as the appropriate guidance for instrument setpoint methodology and further implies that measurement uncertainties should be established as ±1.96 standard deviations for a normal probability distribution, which in general practice is often rounded to two standard deviations (commonly referred to as 2-sigma, or 2$\sigma$).

RG 1.105 applies to safety related instrumentation and states that a setpoint methodology can include a graded approach that should be consistent with the standard (i.e., ISA-S67.04, "Setpoints for Nuclear Safety Related Instrumentation,") and should consider applicable uncertainties regardless of the setpoint application.

RG 1.105 further discusses the application of a "graded" approach as being appropriate for non-safety system instrumentation for maintaining design limits described in the TS. Examples of non-safety systems given in RG 1.105 include instrumentation used for meeting applicable Limited Condition for Operation (LCOs).

As documented in References 3 and 4, the Circulating Water (CW) temperature instrumentation indication loop(s) that are currently used to verify TS Surveillance Requirement (SR) 3.7.3.1 are non-safety related and are part of the LSCS original CW system as initially licensed, with the exception that the original thermocouples have been replaced with higher precision temperature measuring devices (i.e., RTDs). The methodology used for the original calculation provided in Reference 3, was performed using a graded approach for instrument channel accuracy in accordance with EGC procedure NES-EIC-20.04, "Analysis of Instrument Channel Setpoint Error and Instrument Loop Accuracy," (i.e., Reference 16) and was appropriate for a non-safety related indicating loop. NES-EIC-20.04 is consistent with ANSI/ISA-67.04.01-2000, "Setpoints for Nuclear Safety Related Instrumentation," (i.e., Reference 17).

As part of review of the conversion to Improved Standard Technical Specifications (ITS), the NRC specifically reviewed the LSCS graded approach to determination of instrument channel accuracy (i.e., Appendix D of NES-EIC-20.04) in Attachment 1 of a letter dated March 24, 2000 (i.e., Reference 15). The approval of the conversion to ITS and the acceptability of the methodology used for determining setpoints is documented in Reference 13.

On July 22, 1996, the Instrumentation and Controls Branch (HICB) of the NRC issued a Task Interface Agreement (TIA) regarding instrument accuracy, "Task Interface Agreement Evaluation Regarding Instrument Accuracy Affecting Millstone Unit 2," (i.e., Reference 6). In this TIA, the HICB staff reviewed a licensee's interpretation of the applicability of instrument uncertainties against its TSs and the guidelines of RG 1.105.

The TIA documented the NRC position that "instrumentation, other than Reactor Protection System (RPS) or Engineered Safety Feature Actuation System (ESFAS), is not explicitly required by RG 1.105. The instrumentation used to measure the UHS temperature and other similar variables provide operability determination criteria and/or determination that a design limit is met. The instrumentation uncertainty can be accounted for in the plant safety analysis, the TS limiting value, the measured value, surveillance testing, or the emergency procedures."

As stated in Reference 1, the LSCS UHS post-accident temperature is based on current heat removal calculations that analyze for a maximum allowable inlet cooling water temperature value of 104°F. To conservatively account for the worst-case scenario, the CSCS pond cooling water inlet temperature of 104°F consists of the current TS CSCS pond cooling water inlet maximum of 100°F, plus 2°F for transient heat up, plus another 2°F margin to account for additional conservatism. The conservative margin of 2°F is based on the previous thermocouple instrument loop uncertainty value of approximately ± 1.8°F, with 0.2°F margin added.

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The proposed change submitted in Reference 1 included an analysis considering the new precision temperature measuring equipment using the same peak temperature value of 104°F; however, the new analysis assumed an instrument measurement uncertainty of 0.31°F and conservatively uses a bounding margin of 0.5°F. Therefore the indicated UHS temperature may increase from the existing TS limit of 100°F to 101.5°F. With a higher precision method of temperature monitoring, there is an increase in instrument loop accuracy and a corresponding reduction in the uncertainty value assumed in the heat removal calculations that support the current analysis. The current accident analyses results would remain unchanged since the maximum UHS temperature realized using this new analysis remains unchanged.

As further stated in the TIA, the NRC concluded that "the application of ISA S67.04-1982, "Setpoints for Nuclear Safety Related Instrumentation," [i.e., Reference 8] as endorsed by RG 1.105, to instrumentation other than RPS and ESFAS instrumentation setpoints even if used for the evaluation of TS compliance (LCOs) is not specifically addressed by ISA S67.04-1982, RG 1.105 or 10 CFR 50.36." The staff notes, "the UHS temperature is an LCO without a LSSS or a specific safety limit assigned."

In addition, the TIA further states that "the application of ISA S67.04-1982/ RG 1.105 to other than RPS or ESFAS instrumentation provides an acceptable means to identify and document instrument uncertainty assumptions, comply with 10 CFR Part 50, Appendix A, Criterion 13 and 10 CFR Part 50, Appendix B, Part XI and ensure that these assumptions are maintained by the installed instrumentation, test equipment, and procedures. However, ISA standard S67.04-1982 is not required in that other means or methodologies may be utilized in lieu of the ISA standard." LSCS uses a graded approach to determine instrument channel accuracy in accordance with Appendix D of EGC procedure NES-EIC-20.04. NES-EIC-20.04 is consistent with ANSI/ISA-67.04.01-2000 (i.e., Reference 17) and was reviewed by the NRC as part of the conversion to ITS (i.e., Reference 13).

As part of the approval for extended power uprate, Waterford Steam Electric Station, Unit 3, was imposed a license condition regarding instrument uncertainty. On April 27, 2005, (i.e., Reference 9) Entergy Operations, Inc. (Entergy) submitted a request to remove the license condition based on the completion of a description of how Entergy accounted for instrument uncertainty for each TS parameter impacted by the extended power uprate. As part of the regulatory analysis section in this request, Entergy referred to this specific NRC TIA when referring to instrumentation uncertainty methodology for systems other than ESFAS or RPS. Entergy also refers to Branch Technical Position HICB-12, "Guidance on Establishing and Maintaining Instrument Setpoints," (i.e., Reference 11), for providing additional guidance for accounting for instrument uncertainty. The NRC approved the removal of the license condition regarding instrument uncertainty for Waterford Steam Electric Station on May 23, 2005 (i.e., Reference 10).

NRC Branch Technical Position HICB-12 outlines the guidelines for a graded approach of application of instrumentation standards and specifically states, "the application of a standard 'graded' approach, is also appropriate for non-safety system instrumentation maintaining design limits in Technical Specifications."

SR 3.7.3.1 that currently verifies the cooling water temperature supplied to the plant for the CSCS pond (i.e., the UHS) is ≤ 100°F was added to the LSCS TS during the conversion to ITS (i.e., Reference 12). This change was introduced as part of the content consistent with NUREG-1433, Revision 1, "Standard Technical Specifications for General Electric Plants,

BWR 4, " and NUREG-1434, Revision 1, "Standard Technical Specifications for General Electric Plants, BWR 6," and on guidance provided in the NRC's "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors" (i.e., Reference 14). SR 3.7.3.1 was an additional restriction to help ensure the operability of the UHS, and did not exist in the LSCS TS prior to the approval of the conversion to ITS (i.e., Reference 13).

EGC believes that with this denial, the NRC is challenging the current design and TS licensing basis of the LSCS CW system. Furthermore, it is EGC's belief that the technical basis for the denial, as described in the SE, represents a change in the NRC position on the required level of qualification for non-safety related indicating loops, and is inconsistent with UHS instrumentation applications previously reviewed and approved by the NRC that are currently part of the LSCS licensing basis.

EGC Response to Statement 2

Statement 2:

> "the TS modification itself does not adequately address single-unit operation (if only one unit is operating, the lack of flow to the other unit could cause the temperature measurements associated with that unit to become non-representative of the UHS temperature.)"

As stated in the EGC response to Question 6 of the NRC request for additional information (RAI) documented in Reference 3, the method and procedural guidance for determining UHS temperature did not change with the installation of the new measuring devices (i.e., resistance temperature detectors (RTDs)). As stated in Reference 3,

> "The method for determining UHS temperature did not change with the installation of the new measuring devices (i.e., RTDs). Operators perform a shiftly surveillance procedure, which includes recording the daily CW inlet temperature computer point average value for both units. The CW temperatures for any of the installed RTDs on either unit is representative of the UHS temperature recorded to satisfy the 24-hour SR 3.7.3.1. There is no difference in determining the UHS temperature reading to satisfy TS requirements between the old configuration (i.e., thermocouples) and the new configuration (i.e., RTDs). The operators read the Unit 1 and Unit 2 average temperature (i.e., computer point C361) and perform a simple average by calculating (U1C361+U2C361)/2."

The response further states that,

> "If a unit does not have a CW pump in operation (i.e., the unit is shutdown), the operating department surveillance procedure directs the CW temperature to be recorded from the unit that does have a CW pump in operation."

As stated in the EGC response to Question 2 of the NRC request for additional information documented in Reference 3, it is considered that the CW temperature for any of the installed RTDs on either unit is representative of the UHS temperature regardless of the status of the units.

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The LSCS license amendment request to increase the allowable indicated UHS temperature was based solely on a reduction of the existing instrument loop uncertainty value. The new precision temperature measuring equipment that replaced the original thermocouples for LSCS Units 1 and 2 was evaluated in accordance with 10 CFR 50.59, "Changes, tests, and experiments," is installed and fully functional.

Summary

EGC believes that with this denial, the NRC is challenging the current design and TS licensing basis of the LSCS CW system. Furthermore, it is EGC's position that the technical basis for the denial, as described in the SE, represents a change in the NRC position on the required measurement uncertainty methodology for non-safety related indicating loops, and is inconsistent with UHS instrumentation applications previously reviewed and approved by the NRC that are currently part of the LSCS licensing basis.

The method for determining UHS temperature did not change with the installation of the new measuring devices. The LSCS license amendment request to increase the allowable indicated UHS temperature was based solely on a reduction of the existing instrument loop uncertainty value. The new precision temperature measuring equipment that replaced the original thermocouples is installed and fully functional for both units. In addition, the method and procedural guidance for determining UHS temperature did not change with the installation of the new measuring devices (i.e., RTDs).

If the NRC questions the approved UHS design, or believes that the approved design was inadequate, then any new or modified NRC rules and/or staff positions should be managed in accordance with 10 CFR 50.109, "Backfitting." A backfit analysis request is under EGC consideration; however, in the interest of moving forward with this licensing action, EGC has requested a face-to-face meeting with the NRC on January 26, 2007 to discuss the optimum approach for a resubmittal of this license amendment request. In addition, due to the generic industry implications of this newly articulated NRC position that does not appear consistent with the initial UHS design approval, EGC is also requesting that the issue be resolved generically within the industry.

References


1. Letter from K. R. Jury (Exelon Generation Company, LLC) to U.S. NRC, "Request for a License Amendment to Technical Specification 3.7.3, Ultimate Heat Sink," dated March 13, 2006

2. U. S. NRC to C. M. Crane (Exelon Generation Company, LLC), "LaSalle County Power Station, Units 1 and 2 – Request for Additional Information Related to Ultimate Heat Sink License Amendment Request," dated June 15, 2006

3. Letter from J. A. Bauer (Exelon Generation Company, LLC), "Additional Information Supporting the License Amendment Request to Technical Specification 3.7.3, 'Ultimate Heat Sink'," dated July 13, 2006

4. Letter from D. M. Benyak (Exelon Generation Company, LLC), "Additional Information Supporting the License Amendment Request to Technical Specification 3.7.3, 'Ultimate Heat Sink'," dated August 4, 2006

5. U. S. NRC to C. M. Crane (Exelon Generation Company, LLC), "LaSalle County Station, Units 1 and 2 – Denial of License Amendment," dated November 3, 2006

6. Memorandum from R. W. Cooper (U. S. NRC) to P. F. McKee (U. S. NRC), "Task Interface Agreement Evaluation Regarding Instrument Accuracy Affecting Millstone Unit 2, (TAC No. M95177)," dated July 22, 1996

7. RG 1.105, "Instrument Setpoints for Safety Related Systems"

8. ISA S67.04-1982, "Setpoints for Nuclear Safety Related Instrumentation"

9. Letter from T. G. Mitchell (Entergy Operations, Inc.) to U. S. NRC, "License Amendment Request NPF-38-249-1 Extended Power Uprate (Amendment 199) License Condition Regarding Instrument Uncertainty Waterford Steam Electric Station, Unit 3," dated April 27, 2005

10. U. S. NRC to J. E. Venable (Entergy Operations, Inc.), "Waterford Steam Electric Station, Unit 3 (Waterford 3) – Issuance of Exigent Amendment Re: Removal of License Condition on Instrument Uncertainty (TAC No. MC6835)," dated May 23, 2005

11. Branch Technical Position HICB-12, "Guidance on Establishing and Maintaining Instrument Setpoints," dated June 1997

12. Letter from R. M. Krich (Exelon Generation Company, LLC) to U. S. NRC, "Request for Technical Specifications Changes for Dresden Nuclear Power Station, Units 2 and 3, LaSalle County Station, Units 1 and 2, and Quad Cities Nuclear Power Station, Units 1 and 2, to Convert to Improved Standard Technical Specifications," dated March 3, 2000

13. U. S. NRC to O. D. Kingsley (Exelon Generation Company, LLC), "Issuance of Amendments (TAC Nos. MA8388 and MA8390)," dated March 30, 2001

14. U. S. NRC "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors," dated July 22, 1993

15. Letter from R. M. Krich (Exelon Generation Company, LLC) to U. S. NRC, "Analysis of Instrument Channel Setpoint Error and Instrument Loop Accuracy Methodology," dated March 24, 2000

16. EGC Engineering Standard NES-EIC-20.04, "Analysis of Instrument Channel Setpoint Error and Instrument Loop Accuracy," Revision 3

17. ANSI/ISA-67.04.01-2000, "Setpoints for Nuclear Safety Related Instrumentation"