NRR-DMPSPEm Resource

From:	Barillas, Martha
Sent:	Wednesday, November 28, 2018 3:35 PM
To:	Robertson, Jeffrey N; 'Arthur.Zaremba@duke-energy.com'; McDaniel, Sarah A; Earp Jr., Dennis
Subject:	Shearon Harris Nuclear Power Plant, Unit 1 Request for Additional Information regarding the RTS/ESFAS Trip Setpoints Modification LAR
Attachments:	Harris RTS and ESFAS Setpoints LAR RAI L-2018-LLA-0203.pdf

Mr. Robertson,

By letter dated July 30, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18211A546), as supplemented by letter dated September 24, 2018 (ADAMS Accession No. ML18267A102), Duke Energy Progress, LLC (the licensee) submitted a license amendment request for the Shearon Harris Nuclear Power Plant (HNP), Unit 1. The proposed amendment would modify Technical Specification (TS) Table 2.2-1, “Reactor Trip System Instrumentation Trip Setpoints,” and TS Table 3.3-4, “Engineered Safety Features Actuation System Instrumentation Trip Setpoints,” to optimize safety analysis margin in the Final Safety Analysis Report Chapter 15 transient analyses. The U.S. Nuclear Regulatory Commission (NRC) staff has determined that additional information is needed to complete its review. The attached Request for Additional Information (RAI) was e-mailed to the licensee in draft form on November 19, 2018. A clarification call was held on November 28, 2018. The licensee agreed to provide responses to the final RAI by December 28, 2018. A publicly-available version of this final RAI and email will be placed in the NRC’s ADAMS.

Please note that if a response to this email is not received by this date, or an acceptable alternate date with a justification for an extension is not provided in writing, we may deny the application for amendment under the provisions of Title 10 of the *Code of Federal Regulations,* Part 2, Section 108, "Denial of application for failure to supply information."

If you have any questions, please contact me at 301-415-2760 or via email at Martha.Barillas@nrc.gov.

Sincerely,

Martha Barillas
Project Manager
NRR/DORL/Licensing Branch II-2
US Nuclear Regulatory Commission
301-415-2760

Hearing Identifier: NRR_DMPS
Email Number: 687

Mail Envelope Properties (Martha.Barillas@nrc.gov20181128153400)

Subject: Shearon Harris Nuclear Power Plant, Unit 1 Request for Additional Information regarding the RTS/ESFAS Trip Setpoints Modification LAR
Sent Date: 11/28/2018 3:34:38 PM
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From: Barillas, Martha

Created By: Martha.Barillas@nrc.gov

Recipients:
"Robertson, Jeffrey N" <Jeffrey.Robertson@duke-energy.com>
Tracking Status: None
"'Arthur.Zaremba@duke-energy.com'" <Arthur.Zaremba@duke-energy.com>
Tracking Status: None
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Tracking Status: None
"Earp Jr., Dennis" <Dennis.Earp@duke-energy.com>
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MESSAGE	1843	11/28/2018 3:34:00 PM
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Options
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DUKE ENERGY PROGRESS, LLC

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

DOCKET NO. 50-400

REQUEST FOR ADDITIONAL INFORMATION

REGARDING LICENSE AMENDMENT REQUEST TO MODIFY REACTOR TRIP SYSTEM AND ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

EPID: L-2018-LLA-0203

By letter dated July 30, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18211A546), as supplemented by letter dated September 24, 2018 (ADAMS Accession No. ML18267A102), Duke Energy Progress, LLC (the licensee) submitted a license amendment request (LAR) for the Shearon Harris Nuclear Power Plant (HNP), Unit 1. The proposed amendment would modify Technical Specification (TS) Table 2.2-1, "Reactor Trip System Instrumentation Trip Setpoints," and TS Table 3.3-4, "Engineered Safety Features Actuation System Instrumentation Trip Setpoints," to optimize safety analysis margin in the Final Safety Analysis Report Chapter 15 transient analyses. The U.S. Nuclear Regulatory Commission (NRC) staff has determined the following request for additional information (RAI) is needed in order to complete its review.

Regulatory Basis

10 CFR 50.36(c)(1) requires that the TS include safety limits and limiting safety system settings. Safety limits are limits upon important process variables that are found to be necessary to reasonably protect the integrity of certain of the physical barriers that guard against the uncontrolled release of radioactivity. Limiting safety system settings are settings for automatic protective devices related to those variables having significant safety functions.

The regulation at 10 CFR 50.36(c)(2) requires that limiting conditions for operation (LCO), which are the lowest functional capability or performance levels of equipment required for safe operation of the facility, be established.

10 CFR Part 50, Appendix A, General Design Criterion (GDC) 10, "Reactor design," requires that the reactor core and associated coolant, control, and protection systems be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.

GDC 15, "Reactor coolant system design," states that the reactor coolant system and associated auxiliary, control, and protection systems be designed with sufficient margin to assure that the design conditions of the reactor coolant pressure boundary are not exceeded

during any condition of normal operation, including the effects of anticipated operational occurrences.

10 CFR 50.46, “Acceptance criteria for emergency core cooling systems for light-water nuclear power reactor,” as it relates to the acceptable loss-of-coolant accident analysis.

NUREG-0800, Chapter 15 of “Standard Review Plan,” for the review guidance of transients and accident analyses for light-water reactor designs.

SRXB RAI 1 High Neutron Flux Trip – NI System Component Uncertainty

In Section 3.2 of the LAR dated July 30, 2018, the licensee discussed the use of a nuclear instrumentation (NI) system component uncertainty (SCU) in determining the high neutron flux trip setpoint. It indicated that a 5% NI SCU was used to determine the current high neutron flux trip setpoint in TS Table 2.2-1 as functional unit 2. This NI uncertainty encompassed the reactor vessel downcomer water density and radial power redistribution effects. For the safety analysis, the NRC-approved Duke Energy methodologies explicitly modelled effects such as downcomer attenuation, rod shadow, and power tilt. The licensee claimed that when the Duke Energy methodologies are implemented at HNP, the 5% SCU would be overly conservative. Based on its evaluation, the licensee proposes a NI SCU of 3.2% span reduced from the current 5% span SCU.

Please provide a discussion to explain how the proposed NI SCU of 3.2% span is derived and justify the acceptance of the derivation of the proposed 3.2% uncertainty used to determine the TA for the high neutron flux trip setpoint.

SRXB RAI 2 Dropped Rod Analysis without Crediting the High Power Range Negative Neutron Flux Rate Trip

In Section 3.5 of the LAR dated July 30, 2018, the licensee indicates that the high power range negative neutron flux rate trip is currently credited in the dropped rod analysis of record (AOR) in Final Safety Analysis Report (FSAR) Section 15.4.3.1. After Cycle 22, when the NRC-approved Duke Energy methodologies are implemented at HNP, this negative flux rate trip would no longer be credited in the analysis for any Chapter 15 events, and the trip currently designed as functional unit 4 in TS Table 2.2-1, would be deleted from the TS table.

Please provide a discussion of the analysis of the dropped rod event performed with the Duke Energy methodologies and demonstrate that for cases without crediting the high power range negative neutron flux rate trip, the results of the dropped rod analysis meet the applicable Chapter 15 accident analysis acceptance criteria.

SRXB RAI 3 Effects of the TS Changes on the FSAR Chapter 15 Analysis

In the supplemental information dated September 24, 2018, the licensee identifies the following safety analysis limits (SALs) used to determine the total allowance (TA) for the following functional units in TS Table 2.2-1 or TS Table 3.3-4:

Functional Unit No.12	- Reactor Coolant Flow – Low	(SAL = 88.0% RCS Flow)
Functional Unit No. 2.a	- Power Range, Neutron Flux – High	(SAL = 113.5% RTP)
Functional Unit No. 9	- Pressurizer Pressure – Low	(SAL = 1923 psig)
Functional Unit No. 10	- Pressurizer Pressure – High	(SAL = 2422 psig)
Functional Unit No. 7	- Overtemperature ΔT	(K_3 = 0.1% RTP/psig)
Functional Unit No. 8	- Overpower ΔT	(SAL = 115% RTP)
Functional Unit No.1.d	- Safety Injection, Pressurizer Pressure – Low	(SAL = 1742 psig)

The staff notes the values of the above SALs are different from those assumed in the FSAR Chapter 15 analysis. Please provide a discussion to address the effects of each of the above SALs on the analysis of the FSAR Chapter 15 events and demonstrate that the safety analysis limits are acceptable in meeting the Chapter 15 acceptance criteria.

STSB RAI 1

One of the proposed changes to the TS is deletion of the high power range negative neutron flux rate trip (Functional Unit 4 of Table 2.2-1, Reactor Trip System Instrumentation Trip Setpoints). Sections 2.4 and 3.5 of the LAR discuss this proposed change. The LAR states that this trip function is currently credited in the dropped rod analysis of record, but will no longer be credited in any FSAR Chapter 15 accident analysis following the replacement of the current dropped rod analysis with a revised analysis performed in accordance with Duke Energy methodologies.

The LCO 3.3.1 specifies that as a minimum, the Reactor Trip System instrumentation channels and interlocks of Table 3.3-1, shall be operable. Table 3.3-1, Reactor Trip System Instrumentation, specifies the total number of channels, channels to trip, minimum channels operable, applicable mode, and a reference to the Action statement if the LCO is not met. The Power Range, Neutron Flux High Positive Rate, is included in this Table as Functional Unit 3. The LAR does not propose changes to this requirement.

Currently, Table 2.2-1 specifies the total allowance, statistical summation of analysis errors, trip setpoint and allowable value for the Reactor Trip System Instrumentation automatic trip setpoints. Equation 2.2-1 is used to provide a threshold for evaluation of operability of an instrument channel. With the proposed deletion of the high power range negative neutron flux rate trip from Table 2.2-1, the threshold value for determining proper channel performance would no longer be specified in the TS and it is not clear to the staff what controls will be established to manage the trip setpoint and allowable value in the future.

a. Please provide a description of the controls that will be applied to manage the trip setpoint and allowable value in the future.

b. Please also provide additional information to describe how the requirements of LCO 3.3.1 will be satisfied for this RTS function. Specifically, please explain what value will provide the threshold for evaluating operability, and, if applicable, explain why the threshold for operability is not being retained in the TS. Please also provide an explanation of how this value will be administratively controlled.