

From: Wengert, Thomas
Sent: Monday, March 2, 2020 1:34 PM
To: Keele Jr, Riley D
Cc: BICE, DAVID B (ANO); Dixon-Herrity, Jennifer
Subject: ANO-1 Acceptance Review Draft Supplemental Information Request - LAR to Revise Loss of Voltage Relay Allowable Values (EPID L-2020-LLA-0013)
Attachments: ANO-1 Draft Request for Supplemental Information for LOV AVs LAR 3-2-20.pdf

By letter dated January 24, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20024E639), Entergy Operations, Inc. (the licensee) submitted a license amendment request (LAR) that proposed changes to the Arkansas Nuclear One, Unit 1 (ANO-1) technical specifications (TSs). The proposed amendment would modify the ANO-1 TSs by revising the current loss of voltage relay allowable values contained in TS 3.3.8, "Diesel Generator (DG) Loss of Power Start (LOPS)."

To complete its acceptance review of this application, the Nuclear Regulatory Commission (NRC) staff requires supplemental information, as described in the attached draft supplemental information request. In accordance with Office of Nuclear Reactor Regulation (NRR) Office Instruction LIC-109, Revision 2, "Acceptance Review Procedures," dated January 16, 2017 (ADAMS Accession No. ML16144A521), Enclosure 2, "Guide for Performing Acceptance Reviews," Section 4.1, "Discussion of Information Insufficiencies with the Licensee," a conference call should be arranged with the NRC staff no more than 5 working days from this notification to discuss the information required to supplement the application. The licensee may supplement the application within 13 working days following the conference call, as described in LIC-109, Revision 2.

If you have any questions, please contact me at (301) 415-4037.

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Reply Requested: No
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DRAFT SUPPLEMENTAL INFORMATION NEEDED

LICENSE AMENDMENT REQUEST TO

REVISE LOSS OF VOLTAGE RELAY ALLOWABLE VALUES

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT 1

DOCKET NO. 50-368

By letter dated January 24, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20024E639), Entergy Operations, Inc. (Entergy, the licensee) submitted a license amendment request (LAR) for Arkansas Nuclear One, Unit 1 (ANO-1) to modify the loss of voltage (LOV) relay allowable values in ANO-1 Technical Specification (TS) Surveillance Requirement (SR) 3.3.8.2.b.

Specifically, the licensee proposed to change the CHANNEL CALIBRATION with setpoint Allowable Value for SR 3.3.8.2.b:

- | | | |
|-------|----|---|
| From: | b. | Loss of voltage ≥ 1600 V [volts] and ≤ 3000 V with a time delay of ≥ 0.30 seconds and ≤ 0.98 seconds. |
| To: | b. | Loss of voltage \geq <u>3251.5</u> V and \leq <u>3349.5</u> V with a time delay of \geq <u>2.0</u> seconds and \leq <u>2.6</u> seconds. |

The U.S. Nuclear Regulatory Commission (NRC) staff performed an acceptance review of the LAR in accordance with Office of Nuclear Reactor Regulation (NRR) Office Instruction LIC-109, Revision 2, "Acceptance Review Procedures," dated January 16, 2017 (ADAMS Accession No. ML16144A521), and determined that the application is unacceptable for review, with opportunity to supplement because it is missing sufficient information for the NRC staff to independently verify that the proposed LOV relay Allowable Value and their associated time delays are adequate to assure that the required protective actions will be initiated before the associated plant process parameter exceeds its analytical limit.

Background

In its letter dated January 24, 2020, the licensee stated that it is currently developing modifications to the site undervoltage schemes, which are designed to protect important in-plant equipment from damage during degraded voltage conditions. The licensee also stated that the modifications are intended to address, in part, information contained in Regulatory Issue Summary (RIS) 2011-12, "Adequacy of Station Electric Distribution System Voltages," Revision 1, dated December 29, 2011 (ADAMS Accession No. ML113050583). Specifically, the following statement in the Summary of Issues section of the RIS concerning degraded voltage relaying calculations:

The time delay chosen should be optimized to ensure that permanently connected Class 1E loads are not damaged under sustained degraded voltage

conditions (such as a sustained degraded voltage below the DVR [Degraded Voltage Relay] voltage setting(s) for the duration of the time delay setting).

The licensee also stated that the plant modifications will include replacement of the inverse time LOV relays installed on the ANO-1 vital 4160 V switchgear A3 and A4 with definite time LOV relays. The licensee further stated that the ANO-1 undervoltage protection scheme has been re-evaluated as a whole, and that modifications are planned to include overload and overcurrent relay adjustments for some safety-related motors, replacing the existing inverse time LOV relays with definite time relays, and installing two additional degraded voltage relays on each of the vital 480 V load centers to specifically address a sustained undervoltage condition. The installation of the new LOV relays using definite time relays, rather than inverse time loss of voltage principle, necessitates a revision to the Allowable Value in SR 3.3.8.2.b.

Regulatory Basis

- The regulation in 10 CFR 50.36(c)(1)(ii)(A) states in part, “Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded. If, during operation, it is determined that the automatic safety system does not function as required, the licensee shall take appropriate action, which may include shutting down the reactor.”
- The regulation in 10 CFR 50.36(c)(3) states that, “Surveillance requirements 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 limiting conditions for operation will be met.”
- Regulatory Guide (RG) 1.105, Revision 3, “Setpoints for Safety-Related Instrumentation,” dated December 1999 (ADAMS Accession No. ML993560062), describes a method acceptable to the NRC staff for complying with the NRC’s regulations for ensuring that setpoints for safety-related instrumentation are initially within and remain within the TS limits.
- RIS 2011-12, Revision 1, clarifies voltage studies necessary for DVR (second level undervoltage protection) setting bases and Transmission Network/Offsite/Station electric power system design bases for meeting the regulatory requirements specified in General Design Criterion 17, “Electric Power Systems,” to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 Appendix A. The RIS states, in part:

Licensee voltage calculations should provide the basis for their DVR settings, ensuring safety-related equipment is supplied with adequate voltage (dependent on equipment manufacturers design requirements), based on bounding conditions for the most limiting safety-related load (in terms of voltage) in the plant.
- RIS 2006-17, “NRC Staff Position on the Requirements of 10 CFR 50.36, ‘Technical Specifications,’ Regarding Limiting Safety System Settings, During Periodic Testing and Calibration of Instrument Channels,” dated August 24, 2006 (ADAMS Accession No.

ML051810077), discusses issues that could occur during testing of limiting safety system settings (LSSSSs) and which, therefore, may have an adverse effect on equipment operability. The RIS also represents an approach that is acceptable to the NRC staff for addressing these issues for use in licensing actions. The RIS states, in part:

As one measure of instrument operability, the NRC staff expects licensees to verify during testing or calibration that the change in the measured [trip setpoint] TSP since the last test or calibration is within predefined limits (double-sided acceptance criteria band) and to take appropriate actions if the change is outside these limits. The acceptance criteria band should be derived from the licensee's setpoint methodology, including use of generic or plant-specific data.

...

It is NRC staff's position that verifying that the as-found TSP is within the acceptance band limits during test or calibration is part of the determination that an instrument is functioning as required.

Supplemental Information Required

1. Provide a summary of the ANO-1 Loss of Voltage Relay setpoint uncertainty calculation to support the proposed Allowable Value in the Technical Specification Surveillance Requirement. The summary should include the relay setting design basis, such as the nominal setpoint to be used during calibration surveillances, the uncertainties associated with these settings (inclusive of the Potential Transformer ratio and the Institute of Electrical and Electronics Engineers (IEEE) Standard C57.13 Accuracy Class), the expected relay drift between surveillances, measurement and test equipment uncertainties, and the as-found and as-left tolerance acceptance values to be applied during technical specification surveillances. Alternatively, the full setpoint uncertainty calculation may be provided for convenience, but is not necessary.
2. Provide the full ABB catalog number, including options of the new definite time loss of voltage relay, ABB Single Phase Voltage Relays Type 27N, which will provide the applicable pickup and dropout voltages, performance tolerances, and the range of time delays of this proposed device. Indicate whether a harmonic filter will be used, which could affect the repeatability versus temperature range uncertainty.
3. Provide the actual time delay setting range selected for use in the LOV Relay application.