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

January 24, 2017

LICENSEE: Entergy Operations, Inc.

FACILITY: Waterford Steam Electric Station, Unit 3

SUBJECT: SUMMARY OF THE DECEMBER 8, 2016, PUBLIC MEETING WITH ENTERGY OPERATIONS, INC., REGARDING THE LICENSE AMENDMENT REQUEST TO REVISE TECHNICAL SPECIFICATION TABLE 4.3-2 TO RELOCATE EMERGENCY SAFETY FEATURES ACTUATION SYSTEM SUBGROUP RELAYS TO THE SURVEILLANCE FREQUENCY CONTROL PROGRAM (CAC NO. MF8325)

On December 8, 2016, a Category 1 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and representatives of Entergy Operations, Inc. (Entergy, the licensee), by teleconference. The meeting notice and agenda, dated November 23, 2016, are available in the Agencywide Documents Access and Management System (ADAMS) at Accession No. ML16328A335. A list of attendees is enclosed.

The purpose of this meeting was to discuss a license amendment request (LAR) submitted by the licensee for Waterford Steam Electric Station, Unit 3 (Waterford 3) to revise the table notation for Technical Specification (TS) Table 4.3-2, "Engineered Safety Features Actuation System [ESFAS] Instrumentation Surveillance Requirements." The LAR was submitted to the NRC by letter dated September 1, 2016, and may be found in ADAMS under Accession No. ML16245A359.

As described in the LAR, the licensee plans to install a trip-hardening modification to the Waterford 3 ESFAS actuation circuitry to add an additional actuation relay in parallel to the existing actuation relays, resulting in a new relay configuration that contains both the existing relays and new relays. The modification would be installed pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.59, "Changes, tests, and experiments." Subsequent to the modification and issuance of the proposed license amendment, the licensee would revise TS Table 4.3-2 to relocate the surveillance frequency of both the new and existing relays to the Waterford 3 Surveillance Frequency Control Program (SFCP). The surveillance frequency is proposed to be the same for both existing and new relays in the new configuration. During the public meeting it was noted that NRC staff will conduct a review only of the surveillance requirements of the LAR.

In the course of the review, the NRC staff had developed prelimnary questions pertaining to the technical aspect of about the LAR, and communicated these questions to the licensee. The licensee prepared responses and presented those responses at the December 8, 2016, public teleconference. These questions and responses are included in this meeting summary as Enclosure 2. It should be noted that these questions and answers are preliminary and were provided only as topics for discussion during the public meeting. Information required to complete the review of the LAR will be requested by formal requests for additional information (RAIs) and placed on the licensee docket.

During the meeting, the NRC staff discussed the issues described in Enclosure 2 with the licensee with the objective of developing RAIs. The path forward for the discussion questions is summarized below:

As described in RAI 1 of Enclosure 2, the licensee and NRC staff discussed the individual testing of the two contacts in the proposed actuation logic. This issue will be addressed through a final RAI.

As it relates to RAI 2 and RAI 4, the licensee and NRC staff discussed specific features of the proposed trip-hardened circuit. The licensee provided a preliminary circuit diagram to aid in the discussion. The diagram was preliminary, and therefore not included in Enclosure 2. The licensee will provide a final circuit diagram as a response to an RAI.

In RAI 3 and RAI 7, the licensee and NRC staff discussed the relocation of the surveillance frequencies from the TS to the SFCP. Specifically, NRC staff and the licensee discussed whether the phrase "within the past 62 days" met the exclusion criteria outlined in Technical Specification Task Force-425 (TSTF-425), which was implemented at Waterford through Amendment No. 249. (ADAMS Accession No. ML16159A419). In a March 3, 2016, response to an RAI issued during the review of the application for Amendment No. 249 (ADAMS Accession No. ML16063A532), the licensee had stated that the phrase "within the past 62 days" had met the exclusion criteria. In RAI 7 of Enclosure 2 of this meeting summary, the licensee states that the phrase does not meet the exclusion criteria. The licensee will resolve this discrepancy in response to an RAI.

As discussed by the NRC staff and the licensee in RAI 5 and RAI 6, the NRC requested clarification of the LAR as it relates to the proposed modification to the ESFAS circuit, which will be installed pursuant to 10 CFR 50.59. The licensee will provide this clarification as a response to an RAI.

In RAI 8, the NRC staff and the licensee discussed the proposed initial surveillances for the new K105 and K306 relays, which will be installed during the trip-hardening modification. The licensee and staff discussed whether a TS for the surveillance of the new relays must be established as required by Section 50.36(c)(ii) of 10 CFR, or whether the new relays could be categorized under an existing class of relays. This information will be requested via the RAI process.

No regulatory decisions were reached at this meeting. No members of the public called in to listen or provide comments to the NRC staff after the business portion of the meeting. No Public Meeting Feedback forms were received.

Please direct any inquiries to me at 301-415-1390 or April.Pulvirenti@nrc.gov.

April L. Pulvirenti

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Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosures:
1. List of Attendees
2. Preliminary NRC Staff Questions and Licensee Responses

cc w/enclosures: Distribution via Listserv

LIST OF ATTENDEES

DECEMBER 8, 2016, PUBLIC MEETING

WITH ENTERGY OPERATIONS, INC.

REGARDING REVISION OF TECHNICAL SPECIFICATION TABLE 4.3-2

FOR WATERFORD STEAM ELECTRIC STATION, UNIT 3

Entergy Operations, Inc
John Jarrell, Regulatory Assurance
Leia Milster, Regulatory Assurance
Maria Zamber, Regulatory Assurance
Tom Drews, System Engineering
Miguel Barreto, Design Engineering
Victor Collins, Project Support
Jessica Dedrick, Regulatory Assurance
Paul Stanton, Design Assurance
William McKinney
William Steelman
David Anders

U.S. Nuclear Regulatory Commission
April Pulvirenti, Project Manager
Gursharan Singh, Electronics Engineer, Instrumentation and Controls Branch
Peter Snyder, Reactor Systems Engineer, Technical Specifications Branch

Public
None

ENCLOSURE 2

Preliminary NRC Staff Questions and Licensee Responses

Waterford 3 Steam Electric Station
Response to NRC Request for Additional Information
Regarding License Amendment Request to Revise Technical Specification 3/4.3.2 to Relocate Surveillance Frequency Requirements for Engineered Safety Features Actuation System (ESFAS) Subgroup Relays to the Surveillance Frequency Control Program (SFCP)

Request for Additional Information (RAI) xxxx-1

The staff understands that the existing design does not permit in service testability to meet the requirements of General Design Criterion (GDC) 21 and IEEE 279-1971, as supported by References 7, 8, and 9 in the application. The modified design contains two contacts in each circuit and this design should enable testing of one contact at a time during plant operation. Please explain and justify why this feature is not included in the modified design? Were other options considered to enable testing of individual relays during operation, per IEEE 279-1971, Clause 4.10?

Entergy Response to Request RAI xxxx-1

As stated in Reference 1, Attachment 1, page 8, paragraph 6 (reproduced below, with highlight added for emphasis), the ESFAS SPV Trip Hardening Modification will allow testing of the primary relays without actuation of the permissive relays, and individual actuation of any one of these relays will not result in an ESFAS component actuation. Therefore, this feature is included in the modified design.

The ESFAS SPV Trip Hardening Modification will allow testing of the primary relays without actuation of the permissive relays. Individual actuation of any one of these relays will not result in an ESFAS component actuation. Actuation will occur only if the primary and associated permissives are both actuated; this could occur if one of the relays in an actuation pair has failed "off" coincident with testing the other relay in the pair (see section 4.0 for discussion on failure modes). Testing the state of the relays prior to testing using intrusive means introduces the likelihood of an inadvertent plant transient due to human error. Because of this, it is deemed necessary to continue to not test K114, K305, and K313 during power operation as allowed by RG 1.22 and add K105 and K306 to this list of relays that are not tested during power operation due to the

System design did not allow for detection of dropout of either a permissive or a primary relay. WHY?

RAI xxxx-2

The LAR, in part, supports the hardening of the ESFAS single-point vulnerability (SVP) by adding an additional contact in the Feedwater and Main Steam Isolation actuation by Main Steam Isolation Signal (MSIS) and the Closed Component Water containment isolation valve closure actuation by Containment Spray Actuation Signal (CSAS). Please illustrate how the power supply to these relays (with new contact wiring) is independent of the power to the existing relays that are wired in the circuits to ensure trip hardening due to SPV, such that the circuit meets the requirements in IEEE 279-1971.

Entergy Response to Request RAI xxxx-2

The ESFAS SPV Trip Hardening Modification provides additional immunity from inadvertent actuation by selecting the Primary and Permissive relays from different actuation groups. That is, the existing "primary" actuation relay will be on one of the two ESFAS trip legs in each cabinet, and the newly designated "permissive" relay will be powered from the other trip leg, as defined in the following section. This provides immunity from power supply pair failure, power supply breaker failure, or shorting across the relay coils on either trip leg within the ARC. ESFAS trip leg configuration is defined in the following section.

The signal return to the ESFAS ARC power supplies is "split" on the bottom, such that loss of a power supply pair, opening of a power supply breaker, or shorting across a MDR relay on one trip leg will actuate the components on that leg, but will not impact the other leg. This was done to provide some immunity to component failures such that a complete train actuation will not occur unless both trip legs are de-energized.

RAI xxxx-3

Provide the technical justification for removing the final sentence in Table 4.3.-2, Note 3.

Entergy Response to Request RAI xxxx-3

Reference 1, Section 2.0 (third bullet) states the following:

- Table Notation (3) will be renumbered to (2) and revised to delete the second sentence. The frequency for the relays that are not tested during power operation will be included in the SFCP. There will be no change to the first sentence. The "Channel Functional Test" column in the body of Table 4.3-2 will be renumbered accordingly.

The final sentence in Table 4.3-2, Table Notation (3) pertains only to the frequency of the surveillance of the relays that do not need to be tested during power operation, therefore this information will be included in the Waterford 3 SFCP.

As stated in Reference 1, Section 5.0 (first paragraph) (reproduced below), the justification is that removal of this sentence is allowed per TSTF-425. The proposed No Significant Hazards Consideration for TSTF-425 is provided in Reference 1, Attachment 5.

> The proposed license amendment has been evaluated to determine whether applicable regulations and requirements continue to be met. A description of the proposed changes and their relationship to applicable regulatory requirements is provided in TSTF-425, Revision 3, and the NRC's model safety evaluation published in the Notice of Availability dated July 6, 2009 (74 FR 31996). Entergy has modified the TS by the relocation of specific surveillance frequencies to the licensee-controlled SFCP, identified in TS section 6.5.18, which references NEI 04-10, Revision 1. Entergy has concluded that the relationship of the proposed changes to the applicable regulatory requirements presented in the Federal Register notice is applicable to Waterford 3.

RAI xxxx-4

Provide the existing and the proposed circuit diagram of the modification. A simplified diagram in lieu of the actual circuit design is acceptable. This information is needed to understand the specific design changes. This information is needed to demonstrate conformance to GDC 21 and IEEE 279-1971 as it applies to the likelihood of reactor trip if the surveillance is performed during power operation.

Entergy Response to Request RAI xxxx-4

Circuit diagrams are provided in Attachment 2.

RAI xxxx-5

The cover letter for the license amendment application states that "part of this revision is needed to support the ESFAS SPV trip hardening modification." Clarify which part of the revision supports the modification.

Entergy Response to Request RAI xxxx-5

The revision to Table Notation (3) supports the ESFAS modification. The other table revisions are not related to the ESFAS modification. This information is provided in Reference 1, Attachment 1, fourth paragraph as follows (highlight added for emphasis):

TS 3/4.3.2 Table 4.3-2 Table Notation (3) documents that certain ESFAS subgroup relays are not tested during power operation. Additional subgroup relays that are being added to the ESFAS as part of the modification will be subject to the same testing frequency. The note will be revised in order to remove information that is being included in the licensee-controlled SFCP. Following completion of the ESFAS SPV Trip Hardening Modification, the additional relays will be added to the SFCP to the group that is not tested during power operation. This change proposal includes the addition of these relays to the SFCP. Changes to other items in the Table Notation are proposed in order to remove information that is being included in the SFCP and to remove redundancy between the table and the notation.

RAI xxxx-6

Clarify why the details of the modification, which is to be installed per 10 CFR 50.59, were provided in the application if the modification itself is not subject to NRC review.

Entergy Response to Request RAI xxxx-6

The information regarding the ESFAS SPV Trip Hardening Modification was provided for the following reasons:

1. The ESFAS system design is being modified, and therefore the basis for which the allowance to not test some of these relays during power operation is being partially altered. Given that this basis was originally communicated to the NRC (References 7, 8, and 9 of the application), and that the changes were identified during a change evaluation of TS 3/4.3.2 that was performed in support of this modification (as stated in Reference 1, Attachment 1, Section 1.0, third paragraph), Waterford 3 believes that pursuant to 10 CFR 50.9, complete and accurate information should be provided.

2. The evaluation of the ESFAS SPV Trip Hardening Modification that was performed in accordance with 10 CFR 50.59 concluded that testing of the relays would not result in a more than minor increase in the likelihood of an accident or consequences of malfunction are not increased as long as testing is not performed during power operation. This is stated in Reference 1, Section 3.0 (paragraph 5) and Section 5.2 (response to question 1, paragraph 4), which are reproduced below (highlight added for emphasis).

   The hardware changes associated with the ESFAS SPV Trip Hardening Modification are being implemented in accordance with 10 CFR 50.59. The 50.59 evaluation performed concludes that the likelihood of occurrence of a malfunction by implementing this modification is not more than minimal. The likelihood of an accident or consequences of malfunction are not increased as long as testing of the new configuration is not performed during power operation, as required by the initial condition of the applicable Waterford 3 ESFAS subgroup relay test procedure.

   Moreover, testing of the modified relay scheme during power operation could result in inadvertent actuation and subsequent occurrence of an accident if either the permissive or primary relay has failed "off," or actuated. Continued testing in accordance with the SFCP assures inadvertent actuation during testing resulting from a failed "off" relay will not result in an accident described in the UFSAR.

   Due to the fact that there is still potential to cause unsafe plant conditions/operations and subsequent occurrence of an accident described in Chapter 15 of the Waterford 3 UFSAR, it is the position of Waterford 3 that sufficient justification is provided in Reference 1 to invoke the exception allowed by RG 1.22 for cases where testing actuated equipment at power could cause unsafe plant conditions/operations.

3. This modification is scheduled to be installed during spring 2017. In order to support the expedited review requested in the cover letter (reproduced below), Waterford 3 believes that it was necessary to include this information to support the justification for this request.

   Entergy requests approval of the proposed license amendment by March 28, 2017 to support implementation of the ESFAS SPV Trip Hardening Modification during the Waterford 3 spring 2017 refueling outage (RF21). Once approved, the amendment will be implemented prior to entering Mode 4 following RF21.

RAI xxxx-7

Relating to RAI xxxx-3, please note that Amendment 249, i.e. TSTF-425, is not sufficient technical justification for removing all of the final sentence in Table 4.3-2, Note 3. The text "within the previous 62 days" meets the exclusion criteria specified in TSTF-425.

Entergy Response to Request RAI xxxx-7

This is addressed in the response to RAI xxxx-3. In addition, the statement "within the previous 62 days." Per TSTF-425, all surveillance frequencies are relocated except those listed below. This frequency nor this statement do not fall into any of these categories.

- Frequencies that reference other approved programs for the specific interval (such as the Inservice Testing Program or the Primary Containment Leakage Rate Testing Program);
- Frequencies that are purely event driven (e.g., "Each time the control rod is withdrawn to the 'full out' position");
- Frequencies that are event-driven but have a time component for performing the surveillance on a onetime basis once the event occurs (e.g., "within 24 hours after thermal power reaching ≥ 95% RTP"); and
- Frequencies that are related to specific conditions (e.g., battery degradation, age, and capacity) or conditions for the performance of a surveillance requirement (e.g., "drywell to suppression chamber differential pressure decrease").

RAI xxxx-8

Does the initial surveillance for K105 and K306 need approval from NRC staff before being moved to the SFCP?

Entergy Response to Request RAI xxxx-8

The surveillances for K105 and K306 are not currently part of the TS. Following completion of the ESFAS SPV Trip Hardening Modification, K105 and K306 will be actuation subgroup relays (functional units of the MSIS and CSAS). Surveillances for these functional units are included in TS 3/4.3.2. Historically, actuation subgroup relays have been tested with a surveillance frequency of monthly (on a staggered test basis), and this frequency was included in the TS. Where a different frequency was identified and allowed due to an exception, these were identified in Table Notation (3) with the alternate surveillance frequency. These frequencies are subject to the allowances of TSTF-425 and the SFCP, and therefore are no longer required to be included in the TS. Addition of K105 and K306 to the actuation subgroup relays following the modification would be subject to the rules of the SFCP, and are therefore subject to be evaluated in accordance with 10 CFR 50.59. The 50.59 evaluation performed to support the modification does not require NRC approval, and therefore the initial surveillance for K105 and K306 do not need NRC approval before being added to the SFCP.

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