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One Ameren Plaza  
1901 Chouteau Avenue  
PO Box 66149  
St. Louis, MO 63166-6149  
314.621.3222

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Mail Station P1-137  
Washington, DC 20555

ULNRC- 03902

Gentlemen:

**DOCKET NUMBER 50-483**  
**UNION ELECTRIC COMPANY**  
**CALLAWAY PLANT**  
**CHANGES TO ESFAS FUNCTIONAL UNIT 6.f**

References: 1) ULNRC-3674 dated October 31, 1997  
2) ULNRC-3578 dated May 15, 1997

Union Electric Company herewith transmits a supplement to the application for amendment originally submitted in Reference 1. All pages from Reference 1 are included, with revision bars used in the Attachments to denote changes. Reference 2 submitted the Improved Technical Specifications amendment request for Callaway.

This amendment application would revise ESFAS Functional Unit 6.f, Loss of Offsite Power-Start Turbine-Driven Pump, in Technical Specification Tables 3.3-3, 3.3-4, and 4.3-2 as follows:

- (1) Table 3.3-3 is revised to create separate Functional Units for the analog and digital portions of the ESFAS function associated with starting the turbine-driven auxiliary feedwater pump (TDAFP) upon a loss of offsite power. This separation is required to correct the present inconsistency between the operability requirements imposed in Table 3.3-3, written only for the digital circuitry, and the surveillance requirements imposed in Table 4.3-2 which have meaning only for the analog circuitry.
- (2) Table 3.3-4 is also revised to create separate Functional Units for the analog and digital portions of the ESFAS function associated with starting the TDAFP upon a loss of offsite power. This is necessary since the current "N.A." setpoint listings apply only to the digital portion. The analog portion has a Trip Setpoint and Allowable Value, as specified under Functional Unit 8.a.
- (3) Table 4.3-2 is likewise revised to create separate Functional Units for the analog and digital portions of the ESFAS function associated with starting the TDAFP upon a loss of offsite power. This is necessary

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since only the analog portion of this function is subject to a CHANNEL CALIBRATION and a monthly TADOT. The surveillance testing will not change as a result of this amendment application. The surveillance testing currently required by Table 4.3-2, Functional Unit 6.f will be retained under new Functional Unit 6.f.1). A new surveillance requirement would be added to Table 4.3-2 in the form of Functional Unit 6.f.2) to require a refueling interval TADOT of the actuation path for the TDAFP on a Loss of Offsite Power from the load shedder and emergency load sequencer (LSELS) output relays. This surveillance requirement is "new" to Section 3.3; however, the testing itself is currently being performed during the 18-month diesel generator/sequencer surveillance testing per SR 4.8.1.1.2.g (although not specifically called out as a separate line item requirement in that series of surveillance tests). It is noted that the BOP-ESFAS and LSELS actuation logic is tested during power operation under Functional Units 6.c and 10; however, this does not include the entire circuit path from the LSELS output relays to the separation group 2 BOP-ESFAS cabinet.

The Callaway Plant Onsite Review Committee has reviewed this supplement to the amendment application. Attachments 1 through 3 provide the supplemented Significant Hazards Evaluation, Environmental Consideration, and proposed Technical Specification revisions, respectively, in support of this amendment request. In addition, Attachments 4 and 5 provide changes to Attachments 19 and 20 of the license amendment application submitted in Reference 2. It has been determined that this supplement does not alter the conclusions reached in Attachments 1 and 2 of Reference 1.

If you have any questions on this amendment application, please contact us.

Very truly yours,



Alan C. Passwater  
Manager-Corporate Nuclear Services

GGY/jdg

- Attachments:
- 1 - Significant Hazards Evaluation
  - 2 - Environmental Consideration
  - 3 - Proposed Technical Specification Revisions
  - 4 - Changes to ULNRC-3578 Attachment 19
  - 5 - Changes to ULNRC-3578 Attachment 20



cc: M. H. Fletcher  
Professional Nuclear Consulting, Inc.  
19041 Raines Drive  
Derwood, MD 20855-2432

Regional Administrator  
U.S. Nuclear Regulatory Commission  
Region IV  
611 Ryan Plaza Drive  
Suite 400  
Arlington, TX 76011-8064

Senior Resident Inspector  
Callaway Resident Office  
U.S. Nuclear Regulatory Commission  
8201 NRC Road  
Steedman, MO 65077

Kristine M. Thomas (2)  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
1 White Flint, North, Mail Stop 13E16  
11555 Rockville Pike  
Rockville, MD 20852-2738

Manager, Electric Department  
Missouri Public Service Commission  
P.O. Box 360  
Jefferson City, MO 65102

Ron Kucera  
Department of Natural Resources  
P.O. Box 176  
Jefferson City, MO 65102

Denny Buschbaum  
TU Electric  
P.O. Box 1002  
Glen Rose, TX 76043

Pat Nugent  
Pacific Gas & Electric  
Regulatory Services  
P.O. Box 56  
Avila Beach, CA 93424

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**ATTACHMENT ONE**  
**SIGNIFICANT HAZARDS EVALUATION**

## SIGNIFICANT HAZARDS EVALUATION

### INTRODUCTION

This amendment application would revise ESFAS Functional Unit 6.f, Loss of Offsite Power-Start Turbine-Driven Pump, in Technical Specification Tables 3.3-3, 3.3-4, and 4.3-2 as follows:

- (1) Table 3.3-3 is revised to create separate Functional Units for the analog and digital portions of the ESFAS function associated with starting the turbine-driven auxiliary feedwater pump (TDAFP) upon a loss of offsite power. This separation is required to correct the present inconsistency between the operability requirements imposed in Table 3.3-3, written only for the digital circuitry, and the surveillance requirements imposed in Table 4.3-2 which have meaning only for the analog circuitry.

The analog portion, labeled new Functional Unit 6.f.1), consists of the same 4kV bus (NB01 and NB02) undervoltage relays specified in Functional Unit 8.a; however, differing MODE Applicabilities require a separate line item be added to Table 3.3-3. The ACTION Statement for new Functional Unit 6.f.1) is the same as that for Functional Unit 8.a, i.e. ACTION 19, and the same 3.0.4 exception footnote is applied. The current ACTION Statement 22 for Functional Unit 6.f, with its 48 hour allowed outage time (AOT), and the currently specified Total Number of Channels (2), Channels to Trip (1), and Minimum Channels OPERABLE (2) do not apply to the analog portion with its four channels in a two-out-of-four logic, for which continued operation should be allowed with an inoperable channel as long as it is tripped within 1 hour.

The digital portion, labeled new Functional Unit 6.f.2), consists of the output relays from the load shedder and emergency load sequencer (LSELS) cabinets and that portion of the BOP-ESFAS separation group 1 and 4 circuitry associated with the start of the TDAFP upon a loss of offsite power. A new ACTION Statement 39 has been added which recognizes that this digital circuitry is only associated with the TDAFP. As such, the inoperability of one or both logic trains would be given a 48 hour AOT after which the plant would be shutdown. The 48 hour AOT is consistent with that allowed by the current ACTION Statement 22 for Functional Unit 6.f, as well as the AOT allowed by ACTION Statements for other automatically initiated functions, e.g., ACTION Statements 5.a (RTS Functional Unit 6.b) and 26 (ESFAS Functional Unit 9). There should be no requirement to enter Specification 3.0.3 for loss of both logic trains since the only affected end device is the TDAFP.

- (2) Table 3.3-4 is also revised to create separate Functional Units for the analog and digital portions of the ESFAS function associated with starting the TDAFP upon a loss of offsite power. This is necessary since the current "N.A." setpoint listings apply only to the digital portion. The analog portion has a Trip Setpoint and Allowable Value, as specified under Functional Unit 8.a.
- (3) Table 4.3-2 is likewise revised to create separate Functional Units for the analog and digital portions of the ESFAS function associated with starting the TDAFP upon a loss of offsite power. This is necessary since only the analog portion of this function is subject to a CHANNEL CALIBRATION and a monthly TADOT. The surveillance testing will not change as result of this amendment application. The surveillance testing currently required by Table 4.3-2, Functional Unit 6.f will be retained under new Functional Unit 6.f.1). A new surveillance requirement would be added to Table 4.3-2 in the form of Functional Unit 6.f.2) to require a refueling interval TADOT of the actuation path for the TDAFP on a Loss of Offsite Power from the LSELS output relays. This surveillance requirement is "new" to Section 3.3; however, the testing itself is currently being performed during the 18-month diesel generator/sequencer surveillance testing per SR 4.8.1.1.2.g (although not specifically called out as a separate line item requirement in that series of surveillance tests). It is noted that the BOP-ESFAS and LSELS actuation logic is tested during power operation under Functional Units 6.c and 10; however, this does not include the entire circuit path from the LSELS output relays to the separation group 2 BOP-ESFAS cabinet.

## BACKGROUND

### Loss of Offsite Power Instrumentation and Load Shedder and Emergency Load Sequencer

The diesel generators (DGs) provide a source of emergency power when offsite power is either unavailable or is insufficiently stable to allow safe unit operation. If a loss of voltage or degraded voltage condition occurs at the 4.16 kV ESF buses, undervoltage protection will:

- a) Trip the 4.16 kV preferred normal and alternate bus feeder breakers to remove the deficient power source to protect the Class 1E equipment from damage;
- b) Shed all loads from the bus except the Class 1E 480 Vac load centers and centrifugal charging pumps to prepare the buses for re-energization by the LSELS; and
- c) Generate a DG start signal.

There are two sets of undervoltage protection circuits, one for each 4.16 kV NB system bus. Each set consists of a loss of voltage and degraded voltage function. Four potential transformers on each bus provide the necessary input voltages to the protective devices used to perform these functions. The undervoltage protection circuits are described in FSAR Section 8.3.1.1.3.

Four instantaneous undervoltage relays with an associated time delay are provided for each 4.16 kV Class 1E system bus for detecting a loss of bus voltage. The outputs are combined in a two-out-of-four logic to generate an undervoltage signal if the voltage is below approximately 70% for 1 second (nominal delay).

Four degraded voltage bistables with associated time delays are provided for each 4.16 kV Class 1E system bus for detecting a sustained degraded voltage condition. After LSELS timers expire, the four bistable outputs are combined in a two-out-of-four logic to generate a degraded voltage signal if the voltage is below approximately 90%. If the degraded voltage condition is not alleviated within the overall time delay associated with the LSELS timers and feeder breaker time delay relays, the affected bus feeder breaker(s) is tripped.

#### Balance of Plant (BOP) ESFAS

The BOP ESFAS processes signals from the SSPS, signal processing equipment (e.g., LSELS), and plant radiation monitors to actuate certain ESF equipment. There are two redundant trains of BOP ESFAS (separation groups 1 and 4), and a third separation group (separation group 2) to actuate the turbine-driven auxiliary feedwater pump and reposition automatic valves (turbine steam supply valves, turbine trip and throttle valve) as required. The separation group 2 BOP-ESFAS cabinet is considered to be part of the end device (the TDAFP) since this is its only function. The redundant trains provide actuation for the motor-driven auxiliary feedwater pumps (and reposition automatic valves as required, i.e., steam generator blowdown and sample line isolation valves, ESW supply valves, CST supply valves), containment purge isolation, control room emergency ventilation, and emergency exhaust actuation functions.

#### Turbine-Driven Auxiliary Feedwater Pump Start on Loss of Offsite Power

A loss of offsite power (LOP) is indicated by the undervoltage relays detecting a loss of voltage on each ESF bus, as discussed above. Upon satisfying the two-out-of-four loss of voltage logic in the LSELS cabinets, LSELS output relays feed the redundant separation groups 1 and 4 BOP-ESFAS cabinets as shown in the attached Figure 1. The separation groups 1 and 4 BOP-ESFAS cabinets perform several functions, as discussed above, but on a LOP signal these cabinets perform only two functions, i.e., the steam generator blowdown and sample lines are isolated and electrically isolated outputs are provided to the separation group 2 BOP-ESFAS cabinet. The separation group 2 BOP-ESFAS cabinet is only associated with the TDAFP and will continue to be considered part of that end device, i.e., the TDAFP, in the Technical Specifications. On a LOP signal, the turbine steam supply valves (ABHV0005 and ABHV0006) and the turbine trip and throttle valve (FCHV0312) are opened for the start of the TDAFP.



## 50.92 EVALUATION

The proposed change to the Technical Specification does not involve a significant hazards consideration as discussed below.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

Overall protection system performance will remain within the bounds of the previously performed accident analyses since no hardware changes are proposed. The recognition that different operability and surveillance requirements apply to analog vs. digital circuitry does not impact any previously analyzed accidents. The proposed change will not affect any of the analysis assumptions for any of the accidents previously evaluated. The proposed change does not alter the current method or procedures for meeting the surveillance requirements in Table 4.3-2. The proposed change will not affect the probability of any event initiators nor will the proposed change affect the ability of any safety-related equipment to perform its intended function. There will be no degradation in the performance of nor an increase in the number of challenges imposed on safety-related equipment assumed to function during an accident situation. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

There are no hardware changes nor are there any changes in the method by which any safety-related plant system performs its safety function. The separation of analog and digital portions of Functional Unit 6.f will not impact the normal method of plant operation.

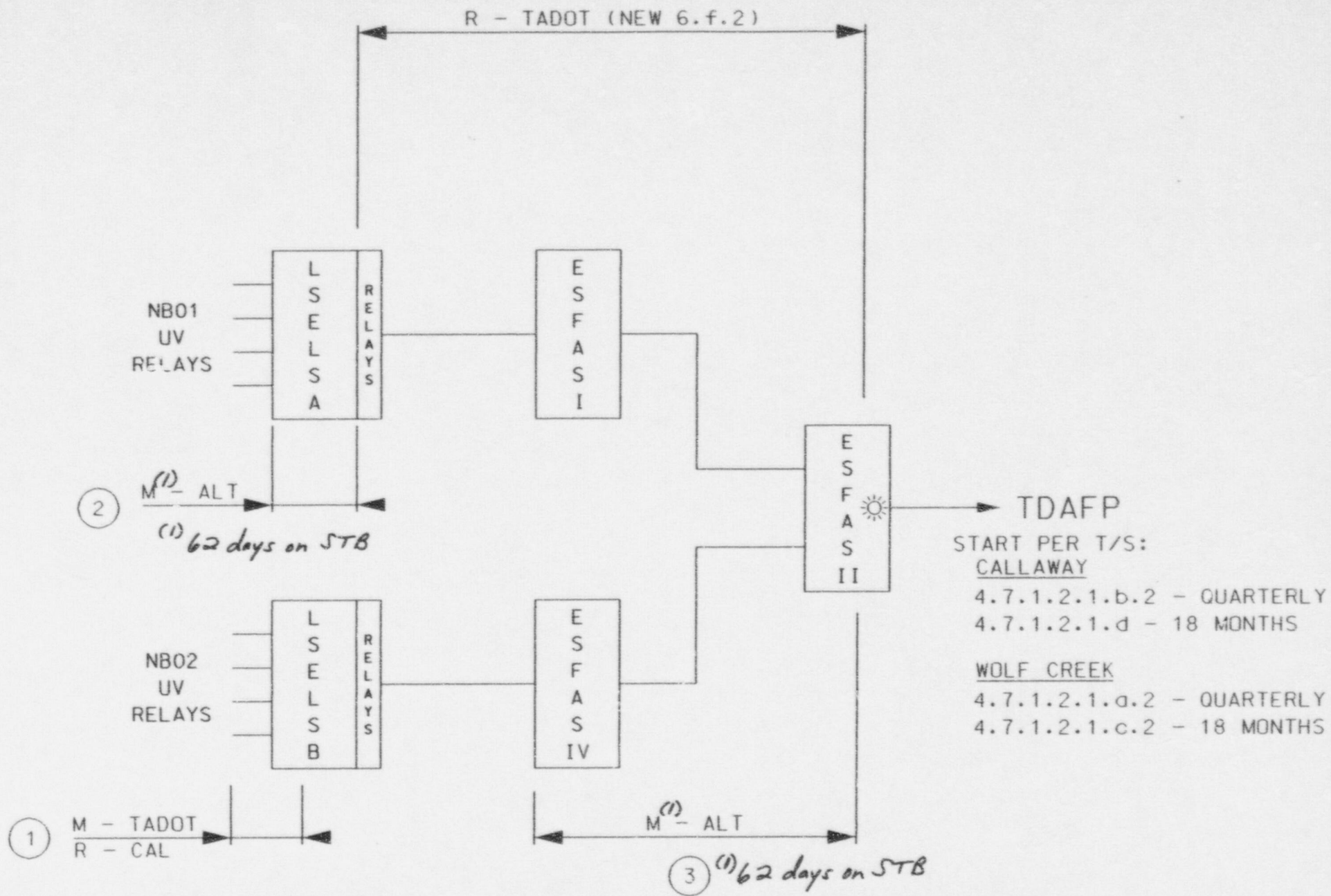
The operability requirements, ACTION Statement, and surveillance requirements for the analog portion, new Functional Unit 6.f.1), are identical to those of Functional Unit 8.a. The requirements for the digital portion, new Functional Unit 6.f.2), are consistent with the current Technical Specifications, other than the new ACTION Statement 39 provisions that eliminate the transient imposed on the plant from a 3.0.3 shutdown and the performance of a refueling interval TADOT. There is no safety benefit associated with shutting the plant down under LCO 3.0.3, if both logic trains were inoperable, when considering the fact that the pump is allowed to be inoperable for 72 hours. This unnecessary shutdown would be detrimental to plant safety. The "new" TADOT requirement is a reflection of current plant testing practice. These changes do not change any ESFAS design standards and are appropriate for digital functions such as this. No new accident scenarios, transient precursors, failure mechanisms, or limiting single failures are introduced as a result of this change. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does this change involve significant reduction in a margin of safety?

The proposed change does not affect the acceptance criteria for any analyzed event. There will be no effect on the manner in which safety limits or limiting safety system settings are determined nor will there be any effect on those plant systems necessary to assure the accomplishment of protection functions. There will be no impact on any margin of safety.

#### CONCLUSION

Based upon the preceding information, it has been determined that the proposed changes to the Technical Specifications do not involve a significant increase in the probability or consequences of any accident previously evaluated, create the possibility of a new or different kind of accident from any accident previously evaluated, or involve a significant reduction in a margin of safety. Therefore, it is concluded that the proposed changes meet the requirements of 10CFR50.92(c) and do not involve a significant hazards consideration.



- ① TABLE 4.3-2, ITEMS 6.f & 8
- ② TABLE 4.3-2, ITEM 10
- ③ TABLE 4.3-2, ITEM 6.c

FIGURE 1

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**ATTACHMENT TWO**  
**ENVIRONMENTAL CONSIDERATION**

### ENVIRONMENTAL CONSIDERATION

This amendment application would revise ESFAS Functional Unit 6.f, Loss of Offsite Power-Start Turbine-Driven Pump, in Technical Specification Tables 3.3-3, 3.3-4, and 4.3-2 as follows:

- (1) Table 3.3-3 is revised to create separate Functional Units for the analog and digital portions of the ESFAS function associated with starting the turbine-driven auxiliary feedwater pump (TDAFP) upon a loss of offsite power. This separation is required to correct the present inconsistency between the operability requirements imposed in Table 3.3-3, written only for the digital circuitry, and the surveillance requirements imposed in Table 4.3-2 which have meaning only for the analog circuitry.
- (2) Table 3.3-4 is also revised to create separate Functional Units for the analog and digital portions of the ESFAS function associated with starting the TDAFP upon a loss of offsite power. This is necessary since the current "N.A." setpoint listings apply only to the digital portion. The analog portion has a Trip Setpoint and Allowable Value, as specified under Functional Unit 8 a.
- (3) Table 4.-3-2 is likewise revised to create separate Functional Units for the analog and digital portions of the ESFAS function associated with starting the TDAFP upon a loss of offsite power. This is necessary since only the analog portion of this function is subject to a CHANNEL CALIBRATION and a monthly TADOT. The surveillance testing currently required by Table 4.3-2, Functional Unit 6.f will be retained under new Functional Unit 6.f.1). A new surveillance requirement would be added to Table 4.3-2 in the form of Functional Unit 6.f.2) to require a refueling interval TADOT of the actuation path for the TDAFP on a Loss of Offsite Power from the load shedder and emergency load sequencer (LSELS) output relays. This surveillance requirement is "new" to Section 3.3; however, the testing itself is currently being performed during the 18-month diesel generator/sequencer surveillance testing per SR 4.8.1.1.2.g (although not specifically called out as a separate line item requirement in that series of surveillance tests).

The proposed amendment involves changes with respect to the use of facility components located within the restricted area, as defined in 10CFR20. Union Electric has determined that the proposed amendment does not involve:

- (1) A significant hazards consideration, as discussed in Attachment 1 of this amendment application;
- (2) A significant change in the types or significant increase in the amounts of any effluents that may be released offsite; or
- (3) A significant increase in individual or cumulative occupational radiation exposure.

Accordingly, the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10CFR51.22(c)(9). Pursuant to 10CFR51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.