

# WOLF CREEK

NUCLEAR OPERATING CORPORATION

Richard A. Muench  
Vice President Engineering

OCT 20 1998

ET 98-0072

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Mail Station P1-137  
Washington, D. C. 20555

Reference: 1) Letter ET 98-0002, dated February 4, 1998, from R. A. Muench, WCNOG to USNRC

2) Letter ET 97-0050, dated May 15, 1997, from R. A. Muench, WCNOG to USNRC

Subject: Docket No. 50-482: Proposed Revision to Technical Specification 3/4.3, Changes to ESFAS Functional Units 6.f, 8.a, and 8.b

Gentlemen:

This letter 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. This supplement addresses questions raised by the NRC staff during a meeting held on August 13, 1998.

This license amendment request proposes to revise Engineered Safety Features Actuation System (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 to create separate Functional Units for the analog and digital portions of the ESFAS function associated with starting the turbine-driven auxiliary feedwater pump on a loss of offsite power.

Additionally, this request proposes to revise Engineered Safety Features Actuation System (ESFAS) Functional Unit 8.a, 4 kV Undervoltage - Loss of Voltage and 8.b, 4 kV Undervoltage - Grid Degraded Voltage, in Technical Specification Table 4.3-2 to add a table notation to clarify that the testing of the time delay relays is performed as part of the CHANNEL CALIBRATION.

A Safety Evaluation is provided in Attachment I. A No Significant Hazards Consideration Determination is provided in Attachment II. Attachment III is the related Environmental Impact Determination. Marked up pages are provided in Attachment IV (for current Technical Specifications and Bases) and in Attachment V (for Improved Technical Specifications and Bases submitted by the Reference 2).

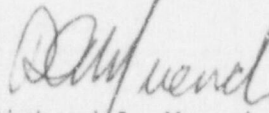
In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated Kansas State Official. This proposed revision to the WCGS Technical Specifications will be fully implemented within 60 days of formal NRC approval.

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If you have any questions concerning this matter, please contact me at (316) 364-4034, or Mr. Michael J. Angus, at 316-364-4077.

Very truly yours,



Richard A. Muench

RAM/rlr

Attachments: I - Safety Evaluation  
II - No Significant Hazards Consideration Determination  
III - Environmental Impact Determination  
IV - Proposed Current Technical Specification Change  
V - Proposed Improved Technical Specification Change  
VI - List of Commitments

cc: V. L. Cooper (KDHE), w/a  
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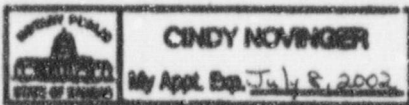
STATE OF KANSAS     )  
                                  )  SS  
COUNTY OF COFFEY    )

Richard A. Muench, of lawful age, being first duly sworn upon oath says that he is Vice President Engineering of Wolf Creek Nuclear Operating Corporation; that he has read the foregoing document and knows the content thereof; that he has executed that same for and on behalf of said Corporation with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By *Richard A. Muench*  
Richard A. Muench  
Vice President  
Engineering

SUBSCRIBED and sworn to before me this 20<sup>th</sup> day of October, 1998.

*Cindy Novinger*  
Notary Public



Expiration Date July 8, 2002



ATTACHMENT I  
SAFETY EVALUATION

## Safety Evaluation

### Proposed Changes

This license amendment request proposes to revise Wolf Creek Generating Station (WCGS) Technical Specification 3.3, Engineered Safety Features Actuation System (ESFAS) Functional Unit 6.f, Loss of Offsite Power-Start Turbine-Driven Pump, in Tables 3.3-3, 3.3-4, and 4.3-2 to create separate Functional Units for the analog and digital portions of the ESFAS function associated with starting the turbine-driven auxiliary feedwater pump upon loss of offsite power.

Additionally, this request proposes to revise Engineered Safety Features Actuation System (ESFAS) Functional Unit 8.a, 4 kV Undervoltage - Loss of Voltage and 8.b, 4 kV Undervoltage - Grid Degraded Voltage, in Technical Specification Table 4.3-2 to add a table notation to clarify that the testing of the time delay relays is performed as part of the CHANNEL CALIBRATION.

### Background

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

The emergency diesel generators (EDGs) 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 Engineered Safety Features (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 load shedder and emergency load sequencer (LSELS); and
- c) Generate a EDG start signal.

There are two sets of undervoltage protection circuits, one for each 4.16 kV Class 1E system (NB) 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 the Updated Safety Analysis Report (USAR) Section 8.3.1.1.3.

Four undervoltage relays with an associated time delay are provided for each 4.16kV 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 Solid State Protection System (SSPS), signal processing equipment, and plant radiation monitors to actuate certain ESF equipment. There are two redundant trains of Balance of Plant (BOP)-ESFAS (separation groups 1 and 4), and a third separation group (separation group 2) to actuate the turbine-driven auxiliary feed water pump and reposition automatic valves (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 TDAFW pump). The redundant trains provide actuation for the motor-driven auxiliary feedwater pumps (and repositions automatic valves as required, i.e., steam generator blowdown and sample line isolation valves, Essential Service Water (ESW) supply valves, Condensate Storage Tank (CST) supply valves), containment purge isolation, control room emergency ventilation, and emergency exhaust actuation functions. A third separation group is provided to actuate the turbine-driven auxiliary feedwater (TDAFW) pump and reposition automatic valves (turbine steam supply valves, turbine trip and throttle valve, ESW supply valves, CST supply valve) as required.

### 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 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 TDAFW pump and will continue to be considered to be part of that end device, i.e., the TDAFW pump, 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 TDAFW pump.

### Evaluation

#### Table 3.3-3

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 TDAFW pump upon 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 1,2 and 4 circuitry associated with the start of the TDAFW pump upon a loss of offsite power. A new ACTION Statement 31 has been added which recognizes that this digital circuitry is only associated with the TDAFW pump. As such, the inoperability of one logic train would be given a 48 hour AOT after which the plant would be shutdown. The 48 hour AOT is a reasonable restoration time considering the nature of this Functional Unit and the available redundancy. 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 Statement 5.a for (Reactor Trip System Functional Unit 6.b) and ACTION Statement 26 for 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 TDAFW pump.

Table 3.3-4

Table 3.3-4 is revised to create separate Functional Units for the analog and digital portions of the ESFAS function associated with starting the TDAFW pump 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.

Table 4.3-2, Functional Unit 6.f

Table 4.3-2 is revised to create separate Functional Units for the analog and digital portions of the ESFAS function associated with starting the TDAFW pump 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 Trip Actuating Device Operational Test (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 TDAFW pump 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.

Table 4.3-2, Functional Unit 8

Table 4.3-2, Functional Unit 8.a, 4 kV Undervoltage - Loss of Voltage and 8.b, 4 kV Undervoltage - Grid Degraded Voltage, is revised to add a table notation to clarify that the testing of the time delay relays is performed as part of the CHANNEL CALIBRATION.

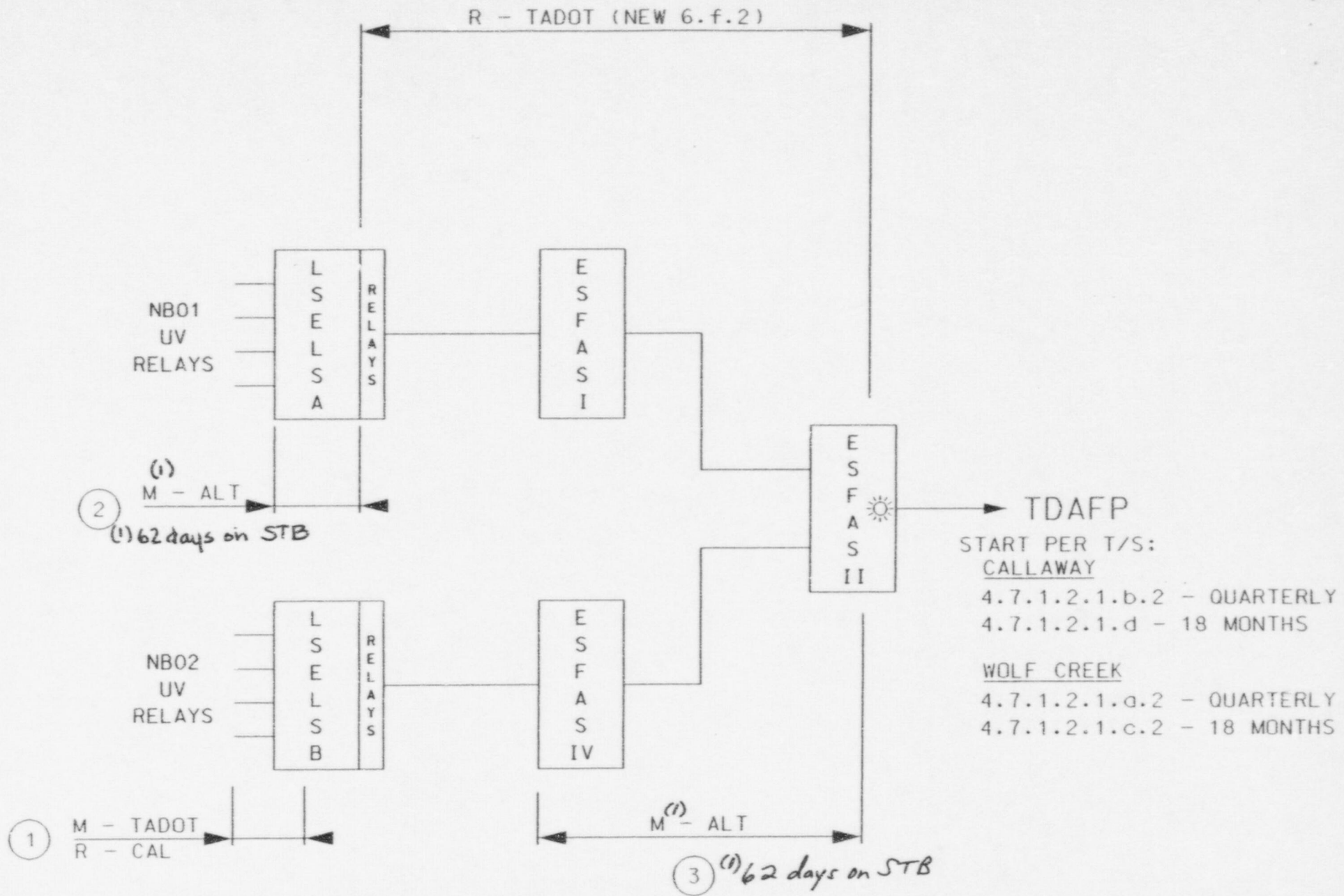
Table 3.3-4, Functional Units 8.a (4kV Undervoltage - Loss of Voltage) and 8.b (4kV Undervoltage - Grid Degraded Voltage) specify voltage trip setpoints and the associated time delays with tolerances for the relays. Testing of the time delay relays has been performed as part of the 18 month CHANNEL CALIBRATION. The calculated tolerances for the time delay setpoints have been evaluated to insure that safety-related systems, subsystems and components would not be adversely affected by drift within the permissible tolerance band. A review of data obtained from past surveillance testing identified

that the time delay relays have remained within the technical specification tolerances. The monthly TADOT is a measurement of the voltage setpoint.

### Conclusion

Based on the above discussions and the No Significant Hazards Consideration Determination presented in Attachment II, the proposed changes do not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Updated Safety Analysis Report; or create a possibility for an accident or malfunction of a different type than any previously evaluated in the safety analyses report; or reduce the margin of safety as defined in the basis for any technical specification. Therefore, the proposed changes do not adversely affect or endanger the health or safety of the general public or involve a significant safety hazard.





- 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

ATTACHMENT II

NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

## No Significant Hazards Consideration Determination

### Proposed Changes

This license amendment request proposes to revise Wolf Creek Generating Station (WCGS) Technical Specification 3.3, Engineered Safety Features Actuation System (ESFAS) Functional Unit 6.f, Loss of Offsite Power-Start Turbine-Driven Pump, in Tables 3.3-3, 3.3-4, and 4.3-2 to create separate Functional Units for the analog and digital portions of the ESFAS function associated with starting the turbine-driven auxiliary feedwater pump upon loss of offsite power.

Additionally, this request proposes to revise Engineered Safety Features Actuation System (ESFAS) Functional Unit 8.a, 4 kV Undervoltage - Loss of Voltage and 8.b, 4 kV Undervoltage - Grid Degraded Voltage, in Technical Specification Table 4.3-2 to add a table notation to clarify that the testing of the time delay relays is performed as part of the CHANNEL CALIBRATION.

### Application of Standards

The following Standards identified in 10 CFR 50.92 have been used to determine whether the proposed changes involve a Significant Hazards Consideration. Each of the identified proposed changes is evaluated against the three Standards.

#### **Standard I - 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 clarification that testing of the time delay relays is performed as part of the CHANNEL CALIBRATION does not impact any previously analyzed events. 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.

#### **Standard II - Create the Possibility of a New or Different Kind of Accident from any 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 or the clarification of testing of the time delay relays 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 31 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 standard and are appropriate for digital functions such as this.

Testing of the time delays relays has been performed as part of the 18 month CHANNEL CALIBRATION. The tolerances for the time delay relays are sufficient to account for relay drift encountered during the 18 month surveillance testing. The calculated tolerances for the time delay setpoints have been evaluated to insure that safety-related systems, subsystems and components would not be adversely affect by drift within the permissible tolerance band.

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.

#### **Standard III - Involve a Significant Reduction in the 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.

#### **Conclusions**

Based on the above discussions, it has been determined that the requested technical specification revisions do not involve a significant increase in the probability of consequences of an accident or other adverse conditions over previous evaluations; or create the possibility of a new or different kind of accident or condition over previous evaluations; or involve a significant reduction in a margin of safety. Therefore, the requested license amendment does not involve a significant hazards consideration.