TXU Electric
Comanche Peak
Steam Electric Station
P.O. Box 1002
Glen Rose, TX 76043
Tel: 254 897 8920
Fax: 254 897 6652
lterry1@txu.com

C. Lance Terry
Senior Vice President & Principal Nuclear Officer

Ref: 10CFR50.90

CPSES-200100196
Log # TXX-01016
File # 00236

January 31, 2001

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 AND 50-446
SUPPLEMENT 2 TO LICENSE AMENDMENT REQUEST 99-10
ALLOWABLE VALUES FOR LOSS OF POWER DIESEL
GENERATOR START INSTRUMENTATION

REF: 1) TXU Electric letter TXX-00008, from C. L. Terry to the NRC, dated May 17, 2000

2) TXU Electric letter TXX-00174, from C. L. Terry to the NRC, dated August 31, 2000

3) Summary of Meeting on November 16, 2000 with Comanche Peak Regulatory Affairs, from Robert E. Moody, NRC Project Manager, dated December 8, 2000

Gentlemen:

Pursuant to 10CFR50.90, TXU Electric submitted, via Reference 1, License Amendment Request (LAR) 99-010 to revise the Allowable Values specified in Technical Specification Table 3.3.5-1, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation" to ensure that the 6.9 kV and 480 V undervoltage relays initiate the necessary actions when required. Subsequently, TXU Electric responded, via Reference 2, to a Request for Additional Information (RAI) from the NRC Staff. This response also included additional marked-up Technical Specifications pages to complete the original LAR 99-010 submittal.

Consistent with items discussed with NRC Project Managers for CPSES on November 16, 2000 (Reference 3), TXU Electric again requests to supplement License Amendment Request (LAR) 99-010 by revising and retaining the upper limits of the Allowable Values for the Preferred and Alternate source bus undervoltages relay settings. As such, the following Attachments (originally submitted as part of References 1 and 2) are revised and resubmitted.

The affidavit for this proposed supplement to LAR 99-010 is provided in Attachment 1. Attachment 2 provides a revised detailed description of the proposed changes , and revision to the safety analysis of the proposed changes and TXU Electric's determination that the proposed changes do not involve a significant hazard consideration. Attachment 2 is the same as in reference 1 except where noted using strike-out and red-line (the deleted text is struck-out and added or revised text is red-lined and in italics). A summary of the changes to attachment 2 is as follows:

1. In section 1.4, the location for the FSAR revisions was updated,
2. In section 2.0, the description of the Allowable Values was revised to denote that the upper limit for the preferred and alternate source bus undervoltage is not being deleted but is being revised to $\leq$ 5580 V,
3. In sections 4.0 and 5.2, the function "that motor start transients do not cause tripping of an available offsite source" was added to the description of the functions of the preferred and alternate source undervoltage relay settings,
4. In section 4.0, the logic for deleting the upper limit for the preferred and alternate source bus undervoltage was replaced with a discussion of the revised value for that limit,
5. In section 4.0, the values for several limits were corrected (">" and "<" were changed to "$\geq$" and "$\leq$", respectively), and
6. In section 5.1, the no significant hazards determination, the response to questions 1 and 3 were revised to delete the discussion of deleting the upper limit for the preferred and alternate bus undervoltage (note that the previous determination provided in reference 1 still remains valid although one of the changes proposed described in the no significant hazards determination in reference 1 is no longer being requested).

Attachment 3 provides the affected Technical Specifications pages marked-up to reflect the proposed changes. Attachment 4 provides the corresponding changes to the affected pages of the Technical Specifications Bases for information. Bases changes will be processed per CPSES procedures. Attachment 5 provides the retyped Technical Specifications pages that incorporates the requested changes. Attachment 6 provides the retyped Technical Specifications Bases pages that incorporated the requested changes. Attachments 3, 4, 5 and 6 reflect the net changes per reference 1,

TXU

reference 2 and this submittal. There were no changes to the marked-up pages of the Final Safety Analysis Report originally submitted as part of Reference 1.

No change is requested to the proposed amendment review and implementation schedules originally submitted by LAR 99-010. As previously stated, approval of this license amendment is not required to support continued safe plant operations.

In accordance with 10CFR50.91(b), TXU Electric is providing the State of Texas with a copy of this proposed amendment.

This communication contains no new licensing basis commitments regarding CPSES Units 1 and 2.

Should you have any questions, please contact Mr. Mike Riggs at (254) 897-5218.

Sincerely,

C. L. Terry

By: Roger D. Walker

Roger D. Walker
Regulatory Affairs Manager

MJR/wp

Attachment:
1. Affidavit
2. Revised Description and Assessment
3. Markup of Technical Specifications Pages
4. Markup of Technical Specifications Bases Pages (for information)
5. Retyped Technical Specifications Pages
6. Retyped Technical Specifications Bases Pages (for information)

c - E. W. Merschoff, Region IV
J. I. Tapia, Region IV
D. H. Jaffe, NRR
Resident Inspectors, CPSES

Mr. Authur C. Tate
Bureau of Radiation Control
Texas Department of Public Health
1100 West 49th Street
Austin, Texas 78704

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)		
	)		
TXU Electric	)	Docket Nos.	50-445
	)		50-446
(Comanche Peak Steam Electric Station,	)	License Nos.	NPF-87
Units 1 & 2)	)		NPF-89

AFFIDAVIT

Roger D. Walker being duly sworn, hereby deposes and says that he is Regulatory Affairs Manager of TXU Electric, the licensee herein; that he is duly authorized to sign and file with the Nuclear Regulatory Commission this supplement to License Amendment Request 99-010; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information and belief.

Roger D. Walker
Regulatory Affairs Manager

STATE OF TEXAS)
)
COUNTY OF Somervell)

Subscribed and sworn to before me, on this 31st day of January, 2001.

Notary Public

Gayle R. Peck Jespersen
Notary Public, State of Texas
My Comm. Expires 03/16/02

ATTACHMENT 2 to TXX-01016

DESCRIPTION AND ASSESSMENT

Description and Assessment

1.0 INTRODUCTION

1.1 Proposed change LAR-99-10 is a request to revise Technical Specifications (TS) Table 3.3.5-1, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation," for Comanche Peak Steam Electric Station (CPSES) Units 1 and 2.

1.2 MARKUP OF EXISTING TECHNICAL SPECIFICATIONS AND BASES

Units 1 and 2: See Attachment 3

1.3 PROPOSED TECHNICAL SPECIFICATIONS AND BASES

Units 1 and 2: See Attachment 4

1.4 FINAL SAFETY ANALYSIS REPORT (FSAR) SECTION 8.3

Units 1 and 2: See Attachment 5 *to TXX-00008*

2.0 DESCRIPTION

TXU Electric has determined that when measurement uncertainties are considered, settings compliant with the Allowable Values specified in Technical Specification Table 3.3.5-1 may not be sufficient to ensure that the 6.9 kV and 480 V undervoltage relays initiate the necessary actions when required. TXU Electric has also determined that one of the Allowable Values is too conservative and could result in unnecessary diesel generator starts. Revised Allowable Values for these undervoltage functions are proposed by this LAR and some unnecessary limits are deleted. More restrictive relay settings, compliant with both the existing and the proposed Technical Specifications, have been implemented to ensure that appropriate protective actions are initiated while this License Amendment is pursued.

TS Table 3.3.5-1 Allowable Values are revised as follows:

(1) Preferred and Alternate source bus undervoltage.

~~Deleted "≤ 5900 V" values and revised~~ *Revised* the Preferred and Alternate source bus undervoltage value from "≤ *5900 V and* ≥ 4900 V" values to "≤ *5580 V and* ≥ 5040 V".

(2) 6.9 kV Class 1E bus loss of voltage.

Deleted "≥ 1935 V" value and revised the 6.9 kV Class 1E bus loss of voltage value from "≤ 3450 V" to "≤ 2115 V". Also, the designation of this relay is changed to better clarify the relay function.

(3) 6.9 kV Class 1E bus degraded voltage.

Revised the 6.9 kV Class 1E bus degraded voltage value from "≥ 5933 V" to "≥ 6024 V".

(4) 480 V Class 1E bus low grid undervoltage, and 480 V Class 1E bus degraded voltage.

Revised the Class 1E bus low grid undervoltage and degraded voltage value from "≥ 443 V" and "≥ 435 V," respectively, to "≥ 439 V".

For information only, this LAR includes proposed changes to the Technical Specification Bases to implement the proposed changes to the Technical Specifications and to include revised Trip Setpoints in Table B 3.3.5-1 associated with the revised Allowable Values in the proposed Technical Specification above.

Also for information, this proposed license amendment includes proposed changes to the CPSES FSAR to include the effects of the analyses performed by TXU Electric in support of this proposed license amendment request (See Attachment 5).

3.0 BACKGROUND

The diesel generators provide a source of emergency power when offsite power is either unavailable or degraded. Undervoltage protection will generate a loss of power (LOP) DG start signal if a loss of voltage or degraded voltage condition occurs in the 6.9 kV bus. Each unit has a designated Preferred offsite power source and a designated Alternate offsite power source. The Preferred offsite power source normally energizes the 6.9kV Class 1E buses. If the Preferred offsite power source is lost, the 6.9kV Class 1E buses are automatically energized from the Alternate offsite power source. If the transfer fails, or if the Alternate offsite power source is not available, the diesel generators are started to energize the 6.9kV Class 1E buses. Undervoltage and degraded voltage protection on the 480 V Class 1E buses supplement the protection provided on the 6.9 kV buses.

The undervoltage protection system, leading to the start of the diesel generators on loss of power, is designed to satisfy the regulatory basis of GDC 17 and 10CFR50.36(c)(1)(ii)(A) and consists of the following functional groups:

- Preferred offsite source undervoltage,
- Alternate offsite source undervoltage,
- 6.9kV Class 1E buses loss of voltage,
- 480V Class 1E buses low grid undervoltage,
- 6.9 kV Class 1E buses degraded voltage, and
- 480V Class 1E buses degraded voltage.

Technical Specification 3.3.5 provides the operability requirements for the Loss of Power Diesel Generator Start Instrumentation. The nominal relay settings are listed in Table B 3.3.5-1; the Allowable Values are listed in Technical Specification Table 3.3.5-1.

The nominal delay settings used in the relays are selected such that adequate protection is provided. Factors that are considered in the relay settings include the protection of equipment operating at the degraded voltages and the prevention of equipment damage when the equipment is re-energized by the alternate power source or following the start and loading of the DG.

As part of a recent review of the Technical Specification Bases, TXU Electric evaluated the accumulated error for the undervoltage, degraded voltage, loss of voltage and low grid undervoltage relay channels, accounting for potential transformer accuracy, temperature and DC input voltage impact on relay accuracy, relay repeatability, and calibration errors. From this review, it was concluded that the margin between the Technical Specification Allowable Value and the nominal trip setting was not sufficient to allow for the expected relay drift and repeatability. Furthermore, the Technical Specification Allowable Values were determined to include inadequate uncertainty allowances.

4.0 TECHNICAL ANALYSIS

TXU Electric identified that Technical Specification Table 3.3.5-1 Allowable Values, except for 480 V Class 1E bus low grid undervoltage, are not conservative. These values do not provide adequate margin from design limits, for the Preferred and Alternate source bus undervoltage, 6.9 kV Class 1E bus loss of voltage, and 6.9 kV and 480 V Class 1E bus degraded voltage LOP DG start functions. Compliance with the Allowable Values does not assure that applicable limits are not exceeded.

The Technical Specification Allowable Values and Technical Specification Bases trip setpoints for these relays are revised in accordance with Regulatory Guide 1.105. The relay settings for each function ~~is~~ *are* established based on the following criteria:

1. The degraded and low grid voltage relays settings should assure loads are isolated from the bus at no lower than 90% of motor rated voltage at the motor terminals during steady state conditions,

2. Preferred and alternate source undervoltage relay settings should assure that *1)* on loss of power or degraded grid, motors are not exposed to a sustained voltage of less than 75% of their rating, *and 2) motor start transients do not cause tripping of an available offsite source.*

3. Loss of voltage (Class 1E 6.9 kV) relay settings should assure that after loss of power the bus voltage has decreased to a sufficiently low value such that on bus re-energization, the motors will not be exposed to a voltage of greater than 1.33 V/Hz.

The Technical Specification Allowable Values for each function are determined by providing an allowance to account for the measurement tolerances, (i.e., potential transformer tolerances, effects of ambient temperature and DC input voltage on relay accuracy), and the tolerances of the test equipment. This method precludes exceeding the design limits when the measured values are within Allowable Values. To determine the Technical Specification Bases setpoints, an allowance to account for the relay drift and relay repeatability with margins is provided between Allowable Values and trip set points. This practice will ensure relay drifts remain within design limits and will preclude unnecessarily declaring a channel inoperable.

The settings established in the Technical Specifications Bases setpoints assure that for normal relay operation:

1. Unnecessary entry into a Limiting Condition for Operation will not occur due to relay drifts.

2. Relays will actuate before the design limits for the function are approached.

3. System transients will not cause nuisance tripping of the source breaker which may result in unnecessary DG starts.

The preferred and alternate offsite source bus undervoltage *relay setting* functions ~~is~~ *are* to assure *1)* that the 6.9 kV system motors will not be exposed to a sustained voltages of less than 75% of their rating *and 2) that motor start transients do not cause tripping of an available offsite source.* The safety function of these relays is to

isolate the class 1E loads from offsite power source before the 6.9 kV motor voltage approaches 75% of 6.6 kV. This design limit is defined as a bus voltage of $\geq$ 4980 V (the voltage is sensed on the low voltage sides of the startup transformers), and the Technical Specification allowable is defined as a voltage of $\geq$ 5040 V. ~~The current upper limits on the Allowable Value for the preferred and alternate bus undervoltage relays do not provide a setpoint that must be chosen to ensure that automatic protective action will correct an abnormal situation before a safety limit is exceeded. As a result, these upper limits on these Allowable Values do not meet the criteria of 10CFR50.36 for a limiting safety system setting and do not meet the criteria for inclusion in the Technical Specifications. Therefore the upper voltage limits on the undervoltage trips have been removed for the preferred and alternate offsite bus undervoltage relays. Upper voltage limits on these relay setpoints are still important, even though they do not meet the criteria for inclusion in the Technical Specifications. If the relays are set too high, unnecessary trips of offsite power and unnecessary diesel generator starts could occur due to normal plant operations such as motor start transients. In addition, if the relays are set too high, offsite power could be tripped following an accident when in fact sufficient voltage is available to support the safety functions. The relay calibration program for these devices controls the setpoints to minimize the likelihood of these undesirable impacts. Thus the upper bound for these relays is being controlled in a manner similar to the various other electrical protection relays on the system that could have a similar impact.~~ *A second function of these relays is to assure that the available offsite source is not tripped during motor start transients. The minimum voltage at 6.9 kV buses during motor start is evaluated to be > 5767 V. The Technical Specification allowable value for this function is defined as a bus voltage of $\leq$ 5580 V.*

The 6.9 kV Class 1E bus loss of voltage function verifies the dead bus status. This function assures that the bus voltage has dropped low enough to be energized from another source and not result in Class 1E equipment damage. A residual voltage of 31.5 % assures that a motor connected to the bus is not exposed to more than 1.33 V/Hz (per ANSI 50.41 - 1982) on bus re-energization. Therefore, the safety limit is defined as a voltage of $\leq$ 2174 V, and Technical Specification allowable value is defined as a voltage of $\leq$ 2115 V. The current lower limit on the Allowable Value for the 6.9 kV Class 1E bus loss of voltage relay does not provide a setpoint that must be chosen to ensure that automatic protective action will correct an abnormal situation before a safety limit is exceeded. Any voltage below the proposed limit will also meet the safety requirement of the function. As a result, this lower limit does not meet the criteria of 10CFR50.36 for a limiting safety system setting and does not meet the criteria for inclusion in the Technical Specifications. Therefore the lower voltage limit on this loss of voltage trip has been removed.

The 6.9 kV Class 1E bus degraded voltage function is to protect 6.9kV system motors from sustained operation at less than 90% (per ANSI 50.41 - 1982) of motor rated voltage. This safety limit is defined as a bus voltage of $\geq$ 5965 V, and Technical Specification allowable is defined as a voltage of $\geq$ 6024 V. The 6.9 kv Class 1E bus degraded voltage relays, via time delays, will trip the 6.9KV bus source breaker after approximately 60 seconds. In the event of an 'S' signal, source breakers are tripped after approximately 8 seconds.

The 480 V Class 1E bus low grid undervoltage function and the 480 V Class 1E bus degraded voltage function protect 480V system motors from sustained operation at less than 90% of motor rated voltages. This limit is defined as a bus voltage of $\geq$ 435 V, and the Technical Specification Allowable is defined as a voltage of $\geq$ 439 V. The 480 V Class 1E bus degraded voltage relays, via time delays, will trip the 6.9KV bus source breaker after approximately 60 seconds. In the event of an 'S' signal, source breakers are tripped after approximately 8 seconds. Although the Allowable Values for both of these functions should be at the same value, the trip set points for 480 V Class 1E bus low grid undervoltage are set by the calibration procedures to actuate before the 480 V Class 1E bus degraded voltage function to provide an early notification of low grid conditions. The 480 V Class 1E bus low grid voltage function actuates an alarm if the condition persists for approximately 60 seconds and will trip the 6.9KV safety related source breaker if an 'S' signal is present.

In summary, the Technical Specification Allowable Values addressed by this change, as described above, assures safe equipment operation without challenging equipment design limits.

5.0 REGULATORY ANALYSIS

5.1 No significant Hazards Consideration Determination

TXU Electric has evaluated whether or not a significant hazards consideration is involved with the proposed changes by focusing on the three standards set forth in 10CFR50.92 as discussed below:

1. Do the proposed changes involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The proposed License Amendment Request includes more restrictive Allowable Values for the Preferred offsite source bus undervoltage function, the Alternate offsite source bus undervoltage function, the

6.9 kv Class 1E bus loss of voltage function, the 6.9 kv Class 1E bus degraded voltage function and the 480 V Class 1E bus degraded voltage function. These more restrictive values assure that all applicable safety analysis limits are being met. The 480 V low grid undervoltage relay allowable value is being lowered to the same as the 480 V degraded voltage relays which matches its function. This is a less restrictive value but the value still assures that all applicable safety analysis limits are being met. Lowering of the 480 V low grid undervoltage allowable value will minimize unnecessary actuations that could challenge plant systems. Changing the 6.9 kV and 480 V degraded voltage, 480 V low grid undervoltage, the 6.9 kV loss of voltage, and the preferred and alternate bus undervoltage Allowable Values in the Technical Specifications has no impact on the probability of occurrence of any accident previously evaluated. Because all accident analyses continue to be met, these changes do not impact the consequences of any accident previously evaluated.

Removal of ~~the upper limits for the preferred and alternate bus undervoltage and~~ the lower limit for the 6.9 kV Class 1E bus loss of voltage relays does not impact the probability of occurrence of any accident previously evaluated. None of the accident analyses are affected, therefore, the consequences of all previously evaluated accidents remain unchanged.

2. Do the proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No

   None of the changes affect plant hardware or the operation of plant systems in a way that could initiate an accident. Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Do the proposed changes involve a significant reduction in a margin of safety?

   Response: No

   There were no changes made to any of the accident analyses or safety analysis limits as a result of this proposed change. Further, the proposed change does not affect the acceptance criteria for any

analyzed event. Removal of ~~the upper limits for the preferred and alternate source bus undervoltage and~~ the lower limit for the 6.9 kV Class 1E bus loss of voltage relays does not change the margin of safety. Each allowable value, as revised, assures the safety analysis limits assumed in the safety analyses as discussed in Chapter 15 of the FSAR is maintained. The margin of safety established by the Limiting Conditions for Operation also remains unchanged. Thus there is no effect on the margin of safety.

Based on the above evaluations, TXU Electric concludes that the activities associated with the above described changes present no significant hazards consideration under the standards set forth in 10CFR50.92 and accordingly, a finding by the NRC of no significant hazards consideration is justified.

5.2 Regulatory Safety Analysis

Applicable Regulatory Requirements / Criteria

10CFR50, Appendix A, General Design Criteria (GDC) 13, "Instrumentation and Control," requires, among other things, that instrumentation be provided to monitor variables and systems and that controls be provided to maintain these variables and systems within prescribed operating ranges.

GDC 17, "Electric Power Systems," requires, among other things, that sufficient onsite and offsite electric power be provided such that sufficient capacity exists to assure that (1) fuel design limits and reactor coolant boundary conditions are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents. Each offsite circuit shall be designed to be available in sufficient time following a loss of all onsite alternating current power supplies and the other offsite electrical power circuit, to assure that specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. Provisions shall be included to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electrical power supplies.

GDC 20, "Protection System Functions," requires, among other things, that the protection system be designed to initiate operation of appropriate systems to ensure that specified acceptable fuel design limits are not exceeded.

10CFR50.36, paragraph (c)(1)(ii)(A) requires, in part, that, where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded.

U. S. NRC Regulatory Guide (RG) 1.105 is NRC guidance which 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 technical specification limits.

The parameters of concern help assure compliance with GDC 13, GDC 20 and 10CFR50.36 by assuring *that motor start transients do not result in tripping of offsite power and* that, upon loss of offsite power or upon degraded offsite power, certain functions are initiated, including but not limited to isolating loads from degraded buses on loss of bus voltage, preventing alternate power sources from re-energizing a bus for which voltage has not sufficiently decayed, and starting the emergency diesel generators. These functions are described in more detail for CPSES in section 8.3.1.1.5.2 (Class 1E Buses - Automatic Transfer), section 8.3.1.1.5.3 (Sequencer Loading), section 8.3.1.1.11 (Onsite Emergency Power Sources), section 8.3.1.2.1 (Compliance), Figure 8.3-3 (Standby Diesel Generator Automatic Starting and Loading Sequence), and Figure 8.3-18 (Undervoltage/Overvoltage Relaying). CPSES is committed to Revision 2 (2/86) of RG 1.105 as discussed in sections 1A(N), 1A(B) and 7.1 of the FSAR.

Analysis

The Allowable Values for the undervoltage, loss of voltage and degraded voltage functions are established by CPSES technical specification 3.3.5, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation." Some of the current Allowable Values in this specification were found to be non-conservative and the ~~upper or~~ lower limit on some were determined to be outside the criteria for inclusion in the Technical Specifications. The Allowable Values were recalculated in accordance with the licensing basis of CPSES (including the commitment to RG 1.105 revision 2) and conservative setpoints were administratively implemented to assure that the required design functions would be performed if needed.

Conclusion

The technical analysis performed by TXU Electric demonstrates that sufficient

parameters are being monitored and controlled in a manner that assures the availability of electric power and protects required equipment to support the accident analyses of Chapter 15 and thus is compliant with GDC 13, 17 and 20 as well as 10CFR50.36 and RG 1.105.

6.0 ENVIRONMENTAL EVALUATION

TXU Electric has determined that the proposed amendment would change requirements with respect to the installation or use of a facility component located within the restricted area, as defined in 10CFR20, or would change an inspection or surveillance requirement. TXU Electric has evaluated the proposed changes and has determined that the changes do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed changes meet the eligibility criterion for categorical exclusion set forth in 10CFR51.22(c)(9). Therefore, pursuant to 10CFR51.22(b), an environmental assessment of the proposed changes is not required.

ATTACHMENT 3 to TXX-01016

MARKUP OF TECHNICAL SPECIFICATIONS PAGES

Pages: **3.3-45**
3.3-47

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Two channels per bus for the 6.9 kV bus loss of voltage ~~undervoltage~~ function inoperable.	D.1	Restore one channel per bus to OPERABLE status.	1 hour
	OR		
	D.2	Declare the affected A.C. emergency buses inoperable.	1 hour
E. Two channels per bus for one or more degraded voltage or low grid undervoltage function inoperable	E.1	Restore one channel per bus to OPERABLE status.	1 hour
	OR		
	E.2.1	Declare both offsite power source buses inoperable.	1 hour
	AND		
	E.2.2	Open offsite power source breakers to the associated buses.	6 hours
F. One or more Automatic Actuation Logic and Actuation Relays trains inoperable.	F.1	Restore train(s) to OPERABLE status.	1 hour
G. Required Action and associated Completion Time not met.	G.1	Enter applicable Condition(s) and Required Action(s) for the associated DG made inoperable by LOP DG start instrumentation.	Immediately

Table 3.3.5-1 (page 1 of 1)
Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

FUNCTION	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Automatic Actuation Logic and Actuation Relays	2 trains	3.3.5.1	NA
2. Preferred offsite source bus undervoltage	2 per bus	3.3.5.2 3.3.5.3	~~≤ 5900 V and ≥ 4900 V~~ ≤ 5580 V and ≥ 5040 V
3. Alternate offsite source bus undervoltage	2 per bus	3.3.5.2 3.3.5.3	~~≤ 5900 V and ≥ 4900 V~~ ≤ 5580 V and ≥ 5040 V
4. 6.9 kV Class 1E bus ~~undervoltage~~ loss of voltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	~~≥ 1935 V and ≤ 3450 V~~ ≤ 2115 V
5. 6.9 kV Class 1E bus degraded voltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	~~≥ 5933 V~~ ≥ 6024 V
6. 480 V Class 1E bus low grid undervoltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	~~≥ 443 V~~ ≥ 439 V
7. 480 V Class 1E bus degraded voltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	~~≥ 435 V~~ ≥ 439 V

ATTACHMENT 4 to TXX-01016

MARKUP OF TECHNICAL SPECIFICATIONS BASES PAGES
(For Information Only)

Pages B 3.3-149
B 3.3-150
B 3.3-151
B 3.3-159

B 3.3 INSTRUMENTATION

B 3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

BASES

BACKGROUND The DGs provide a source of emergency power when offsite power is either unavailable or is insufficiently stable to allow safe unit operation. Undervoltage protection will generate an LOP start if a loss of voltage or degraded voltage condition occurs in the 6.9kV bus. Each unit has a designated Preferred offsite power source and a designated Alternate offsite power source. The Preferred offsite power source normally energizes the 6.9 kV Class 1E buses. If the Preferred offsite power source is lost, the 6.9 kV Class 1E buses are automatically energized from the Alternate offsite power source. If the transfer fails, or if the Alternate offsite power source is not available, the diesel generators are started to energize the 6.9 kV Class 1E buses.

For each unit, the undervoltage protection system, leading to the start of the diesel generators on loss of power, consists of the following functional groups:

- Preferred offsite source undervoltage,
- Alternate offsite source undervoltage,
- 6.9 kV Class 1E buses loss of ~~under~~ voltage,
- 480 V Class 1E buses low grid undervoltage,
- 6.9 kV Class 1E buses degraded voltage, and
- 480 V Class 1E buses degraded voltage.

Each of the above groups consists of two sensing relays per bus that provide input to two-out-of two logic. The LOP start actuation logic is described in FSAR, Section 8.3 (Ref. 1). In general, sensing relays for each train feed a network of logic and actuation relays for their respective trains. The network of logic and actuation relays actuate the offsite power source breakers and generator start signals as described in the FSAR.

(continued)

BASES

BACKGROUND (continued)

Trip Setpoints and Allowable Values

The Trip Setpoints and associated time delays used in the relays are consistent with the analytical limits presented in FSAR, Chapter 15 (Ref. 2). The selection of these Trip Setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account.

The actual nominal Trip Setpoint entered into the relays is within the allowable value or more conservative than that required by the Allowable Value. If the measured setpoint does not exceed the Allowable Value, the relay is considered OPERABLE.

Setpoints adjusted in accordance with the Allowable Value ensure that the consequences of accidents will be acceptable, provided the unit is operated within the Limiting Condition for Operations at the onset of the accident and that the equipment functions as designed.

Allowable Values are specified in Table 3.3.5-1 for each Function in SR 3.3.5.3. The Trip Setpoints are listed in Table B 3.3.5-1. The nominal setpoints are selected to ensure that the setpoint measured by the surveillance procedure does not exceed the Allowable Value if the relay is performing as required. If the measured setpoint does not exceed the Allowable Value, the relay is considered OPERABLE. Operation with a Trip Setpoint less conservative than the nominal Trip Setpoint, but within the Allowable Value, is acceptable provided that operation and testing is consistent with the assumptions of the unit specific setpoint calculation. Each Allowable Value specified takes into account the instrument uncertainties appropriate to the trip function. These uncertainties are defined in the ~~setpoint~~ relay setting calculations.

APPLICABLE SAFETY ANALYSES

The LOP DG start instrumentation is required for the Engineered Safety Features (ESF) Systems to function in any accident with a loss of offsite power or degraded power system. Its design basis is that of the ESF Actuation System (ESFAS).

(continued)

BASES

APLICABLE SAFETY ANALYSES (continued)

Accident analyses credit the loading of the DG based on the loss of offsite power with or without a loss of coolant accident (LOCA). The actual DG start has historically been associated with the ESFAS actuation. The DG loading has been included in the delay time associated with each safety system component requiring DG supplied power following a loss of offsite power. The analyses assume a non- mechanistic DG loading, which does not explicitly account for each individual component of loss of power detection and subsequent actions.

The required channels of LOP DG start instrumentation, in conjunction with the ESF systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents discussed in Reference 2, in which a loss of offsite power is assumed.

The delay times assumed in the safety analysis for the ESF equipment include the 10 second DG start delay, and the appropriate sequencing delay, if applicable. The response times for ESFAS actuated equipment include the appropriate DG loading and sequencing delay. The LOP DG start instrumentation channels satisfy Criterion 3 of 10CFR50.36(c)(2)(ii).

LCO

The LCO for LOP DG start instrumentation requires that two channels per bus of ~~both~~ the loss of voltage, undervoltage and degraded voltage Functions shall be OPERABLE in MODES 1, 2, 3, and 4 when the LOP DG start instrumentation supports safety systems associated with the ESFAS. Two trains of Automatic Actuation Logic and Actuation Relays shall also be OPERABLE in MODES 1, 2, 3 and 4. In MODES 5 and 6, there is sufficient time available such that a manual start of the DGs is acceptable. Loss of the LOP DG Start Instrumentation Function could result in the delay of safety systems initiation when required. This could lead to unacceptable consequences during accidents. During the loss of offsite power the DG powers the motor driven auxiliary feedwater pumps. Failure of these pumps to start would leave only one turbine driven pump, as well as an increased potential for a loss of decay heat removal through the secondary system.

(continued)

Table B 3.3.5-1 (page 1 of 1)
LOP DG Start Instrumentation Trip Setpoint

FUNCTION	TRIP SETPOINT
Offsite Sources Undervoltage	
6.9 kV Preferred	~~≥ 5004 Volts~~ 5185 Volts
6.9 kV Alternate	~~≥ 5004 Volts~~ 5185 Volts
6.9 kV Class 1E Bus ~~Undervoltage~~ Loss of Voltage	~~≥ 2037 Volts~~ 2022 Volts
6.9 kV Class 1E Bus Degraded Voltage	~~≥ 6054 Volts~~ 6192 Volts
480 V Class 1E Bus Low Grid Undervoltage	~~≥ 447 Volts~~ 449.6 Volts
480 V Class 1E Bus Degraded Voltage	~~≥ 439 Volts~~ 442.4 Volts

ATTACHMENT 5 to TXX-01016

RETYPED TECHNICAL SPECIFICATIONS PAGES

Pages: 3.3-45
3.3-47

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Two channels per bus for the 6.9 kV bus loss of voltage function inoperable.	D.1	Restore one channel per bus to OPERABLE status.	1 hour
	OR		
	D.2	Declare the affected A.C. emergency buses inoperable.	1 hour
E. Two channels per bus for one or more degraded voltage or low grid undervoltage function inoperable	E.1	Restore one channel per bus to OPERABLE status.	1 hour
	OR		
	E.2.1	Declare both offsite power source buses inoperable.	1 hour
	AND		
	E.2.2	Open offsite power source breakers to the associated buses.	6 hours
F. One or more Automatic Actuation Logic and Actuation Relays trains inoperable.	F.1	Restore train(s) to OPERABLE status.	1 hour
G. Required Action and associated Completion Time not met.	G.1	Enter applicable Condition(s) and Required Action(s) for the associated DG made inoperable by LOP DG start instrumentation.	Immediately

Table 3.3.5-1 (page 1 of 1)
Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

FUNCTION	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Automatic Actuation Logic and Actuation Relays	2 trains	3.3.5.1	NA
2. Preferred offsite source bus undervoltage	2 per bus	3.3.5.2 3.3.5.3	≤ 5580 V and ≥ 5040 V
3. Alternate offsite source bus undervoltage	2 per bus	3.3.5.2 3.3.5.3	≤ 5580 V and ≥ 5040 V
4. 6.9 kV Class 1E bus loss of voltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	≤ 2115 V
5. 6.9 kV Class 1E bus degraded voltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	≥ 6024 V
6. 480 V Class 1E bus low grid undervoltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	≥ 439 V
7. 480 V Class 1E bus degraded voltage	2 per bus	3.3.5.2 3.3.5.3 3.3.5.4	≥ 439 V

ATTACHMENT 6 to TXX-01016

RETYPED TECHNICAL SPECIFICATIONS BASES PAGES
(For Information Only)

Pages B 3.3-149
B 3.3-150
B 3.3-151
B 3.3-159

B 3.3 INSTRUMENTATION

B 3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

BASES

BACKGROUND The DGs provide a source of emergency power when offsite power is either unavailable or is insufficiently stable to allow safe unit operation. Undervoltage protection will generate an LOP start if a loss of voltage or degraded voltage condition occurs in the 6.9 kV bus. Each unit has a designated Preferred offsite power source and a designated Alternate offsite power source. The Preferred offsite power source normally energizes the 6.9 kV Class 1E buses. If the Preferred offsite power source is lost, the 6.9 kV Class 1E buses are automatically energized from the Alternate offsite power source. If the transfer fails, or if the Alternate offsite power source is not available, the diesel generators are started to energize the 6.9 kV Class 1E buses.

For each unit, the undervoltage protection system, leading to the start of the diesel generators on loss of power, consists of the following functional groups:

- Preferred offsite source undervoltage,
- Alternate offsite source undervoltage,
- 6.9 kV Class 1E buses loss of voltage,
- 480 V Class 1E buses low grid undervoltage,
- 6.9 kV Class 1E buses degraded voltage, and
- 480 V Class 1E buses degraded voltage.

Each of the above groups consists of two sensing relays per bus that provide input to two-out-of two logic. The LOP start actuation logic is described in FSAR, Section 8.3 (Ref. 1). In general, sensing relays for each train feed a network of logic and actuation relays for their respective trains. The network of logic and actuation relays actuate the offsite power source breakers and generator start signals as described in the FSAR.

(continued)

BASES

BACKGROUND (continued)

Trip Setpoints and Allowable Values

The Trip Setpoints and associated time delays used in the relays are consistent with the analytical limits presented in FSAR, Chapter 15 (Ref. 2). The selection of these Trip Setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account.

The actual nominal Trip Setpoint entered into the relays is within the allowable value or more conservative than that required by the Allowable Value. If the measured setpoint does not exceed the Allowable Value, the relay is considered OPERABLE.

Setpoints adjusted in accordance with the Allowable Value ensure that the consequences of accidents will be acceptable, provided the unit is operated within the Limiting Condition for Operations at the onset of the accident and that the equipment functions as designed.

Allowable Values are specified in Table 3.3.5-1 for each Function in SR 3.3.5.3. The Trip Setpoints are listed in Table B 3.3.5-1. The nominal setpoints are selected to ensure that the setpoint measured by the surveillance procedure does not exceed the Allowable Value if the relay is performing as required. If the measured setpoint does not exceed the Allowable Value, the relay is considered OPERABLE. Operation with a Trip Setpoint less conservative than the nominal Trip Setpoint, but within the Allowable Value, is acceptable provided that operation and testing is consistent with the assumptions of the unit specific setpoint calculation. Each Allowable Value specified takes into account the instrument uncertainties appropriate to the trip function. These uncertainties are defined in the relay setting calculations.

APPLICABLE SAFETY ANALYSES

The LOP DG start instrumentation is required for the Engineered Safety Features (ESF) Systems to function in any accident with a loss of offsite power or degraded power system. Its design basis is that of the ESF Actuation System (ESFAS).

(continued)

BASES

APLICABLE SAFETY ANALYSES (continued)

Accident analyses credit the loading of the DG based on the loss of offsite power with or without a loss of coolant accident (LOCA). The actual DG start has historically been associated with the ESFAS actuation. The DG loading has been included in the delay time associated with each safety system component requiring DG supplied power following a loss of offsite power. The analyses assume a non- mechanistic DG loading, which does not explicitly account for each individual component of loss of power detection and subsequent actions.

The required channels of LOP DG start instrumentation, in conjunction with the ESF systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents discussed in Reference 2, in which a loss of offsite power is assumed.

The delay times assumed in the safety analysis for the ESF equipment include the 10 second DG start delay, and the appropriate sequencing delay, if applicable. The response times for ESFAS actuated equipment include the appropriate DG loading and sequencing delay. The LOP DG start instrumentation channels satisfy Criterion 3 of 10CFR50.36(c)(2)(ii).

LCO

The LCO for LOP DG start instrumentation requires that two channels per bus of the loss of voltage, undervoltage and degraded voltage Functions shall be OPERABLE in MODES 1, 2, 3, and 4 when the LOP DG start instrumentation supports safety systems associated with the ESFAS. Two trains of Automatic Actuation Logic and Actuation Relays shall also be OPERABLE in MODES 1, 2, 3 and 4. In MODES 5 and 6, there is sufficient time available such that a manual start of the DGs is acceptable. Loss of the LOP DG Start Instrumentation Function could result in the delay of safety systems initiation when required. This could lead to unacceptable consequences during accidents. During the loss of offsite power the DG powers the motor driven auxiliary feedwater pumps. Failure of these pumps to start would leave only one turbine driven pump, as well as an increased potential for a loss of decay heat removal through the secondary system.

(continued)

Table B 3.3.5-1 (page 1 of 1)
LOP DG Start Instrumentation Trip Setpoint

FUNCTION	TRIP SETPOINT
Offsite Sources Undervoltage	
6.9 kV Preferred	5185 Volts
6.9 kV Alternate	5185 Volts
6.9 kV Class 1E Bus Loss of Voltage	2022 Volts
6.9 kV Class 1E Bus Degraded Voltage	6192 Volts
480 V Class 1E Bus Low Grid Undervoltage	449.6 Volts
480 V Class 1E Bus Degraded Voltage	442.4 Volts