

PORTLAND GENERAL ELECTRIC COMPANY
EUGENE WATER & ELECTRIC BOARD
AND
PACIFIC POWER & LIGHT COMPANY

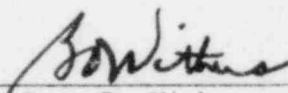
TROJAN NUCLEAR PLANT

Operating License NPF-1
Docket 50-344
License Change Application 67

This License Change Application is submitted in support of Licensee's request to modify Appendix A of Facility Operating License NPF-1 by addition of new Technical Specifications regarding the 4.16 kV Emergency Bus Undervoltage Protection System.

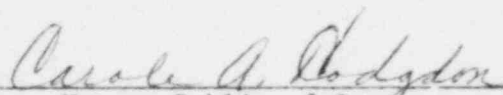
PORTLAND GENERAL ELECTRIC COMPANY

By



Bart D. Withers
Vice President
Nuclear

Subscribed and sworn to before me this 12th day of November 1980.



Notary Public of Oregon

My Commission Expires:

August 9, 1983

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LICENSE CHANGE APPLICATION 67

1. Modify the below-listed pages of Technical Specifications (Appendix A to FOL NPF-1), Section 3/4.8, "Electrical Power System", as shown in Attachment:
 - a. Add new Specification 3/4.8.3 (Page 3/4 8-11), "Undervoltage Protection".
 - b. Add Table 3.8-1 (Page 3/4 8-12), "4.16 kV Emergency Bus Undervoltage Protection Instrumentation" and associated Action Statements on Page 3/4 8-13.
 - c. Add Table 3.8-2 (Page 3/4 8-14), "4.16 kV Emergency Bus Undervoltage Protection Instrumentation Trip Setpoints".
 - d. Add Table 4.8-1 (Page 3/4 8-15), "4.16 kV Emergency Bus Undervoltage Protection Instrumentation Surveillance Requirements".
 - e. Revise Index Page VII to include Section 3/4.8.3, "Undervoltage Protection".

REASONS FOR CHANGE

The NRC letter of June 6, 1979 requested a review of the onsite emergency power systems to assess the susceptibility of the safety-related electrical equipment with regard to the sustained degraded voltage conditions of the offsite power sources and the interaction between the offsite and onsite emergency power systems. The NRC also requested that appropriate Technical Specification changes be incorporated into the Trojan Operating License in accordance with the revised NRC model Technical Specifications to provide a second level of voltage protection for the onsite power system. The Technical Specification changes involved two areas: (1) Limiting Condition for Operation, Surveillance Requirements, trip setpoints with minimum and maximum limits for the first and second-level voltage protection relays, and (2) surveillance testing of the onsite power source, diesel generators, at each refueling interval to show functional operability and independence.

The latter Technical Specification change had been proposed by PGE via LCA 37 submitted on November 30, 1977 to the NRC. This Technical Specification change requires testing of each diesel generator by simulating a loss of offsite power in conjunction with a safety injection actuation test signal.

In responding to the NRC requirement of the other Technical Specification change, PGE, in its response to the June 6, 1979 NRC letter, agreed to provide a second level of voltage protection for the onsite power system. New Technical Specifications for the case of loss of power are provided in Specification 3/4.8.3, Tables 3.8-1, 3.8-2 and 4.8-1.

SAFETY EVALUATION

I. First-Level Undervoltage Protection (Loss of Voltage)

The first-level (or primary) undervoltage protection (loss of voltage) will consist of a set of four solid-state definite time (1-sec. time delay) undervoltage relays connected to each of the two 4.16-kV ESF buses. The existing logic is 1 out of 2; this proposed modification will have 2 out of 4 logic. This 2 out of 4 logic with 1 sec. delay for the primary (loss of voltage) scheme is based upon the requirements of the FSAR, Section 8.3 (Page 8.3-41) which states "1 second or more" for the bus undervoltage protection.

The setpoint for the primary (loss of voltage) undervoltage protection is 2.56 kV and will be duplicated on the new relays. Due to the 1 sec. time delay as discussed in the FSAR, Section 8.3, the selected time delay setting will be 1.1 sec. ± 0.1 sec. to assure ≥ 1 sec. relay accuracy.

II. Second Level Undervoltage Protection (Degraded Voltage)

The proposed second level of protection will consist of a set of four solid-state definite time (4-sec. time delay) undervoltage relays and two timers (set for 56-sec. time delay) connected to each of the two 4.16-kV ESF buses. The following coincidence logic will be used for relays and timers' operation:

1. If a safety injection signal (SIS) is present and two of the 4-sec. level undervoltage relays operate, the normal 4.16-kV ESF bus feeder breakers (Breakers 152-101 and 152-201 in FSAR Figure 8.3-1) will be tripped unless the undervoltage condition corrects itself within 4 sec.
2. Without the presence of SIS, if two of the 4-sec. level undervoltage relays and one of the two timers operate, the normal 4.16-kV ESF bus feeder breakers will be tripped unless the undervoltage condition corrects itself within 60 sec.

This coincidence logic is used to minimize the possibility of spurious trips on both the first and second-level undervoltage protection schemes for loss or degradation of offsite power sources. The offsite power system is the common source, which normally supplies power to the safety-related buses. Since a sustained degradation in the voltage of the offsite power system could result in the loss of capability of the safety loads, the control circuitry and the associated electrical components required for performing safety functions, minimizing serious trips on undervoltage protection will reduce unnecessary load shedding and diesel start.

In addition to the 2 out of 4 coincidence logic scheme, time delay is also included in the degraded voltage (second level) scheme in order to prevent unnecessary challenge to diesel generators. The time delay was selected based on the following conditions:

1. The selected time delay, including margin, shall not exceed the allowable maximum time delay (10 sec.) assumed in the FSAR accident analysis.
2. The effect of short duration disturbances such as switching transients and line faults will not cause the diesels to start and load. Thus, the availability of the offsite power source is not reduced.
3. Safety systems or components will not fail since they are designed to operate at reduced voltage levels above the second level undervoltage protection setpoint for a minimum of 60 sec. without opening safety circuits or exceeding insulation temperature limits.

The setpoint chosen for activation of the second level undervoltage protection system is 3.85 kV on the 4.16-kV bus. This setpoint value under maximum safety load conditions corresponds to 230 kV on the offsite power grid. The 3.85-kV (230 kV) setpoint results in an undervoltage protection scheme that is initiated at voltages below the normal operating range of the offsite power grid voltage, which is presently between 235 kV and 240 kV. With +80-V of tolerance band width about the 3.85-kV setpoint, the highest grid voltage at which the undervoltage protection system relay would pick up is 3850-V plus 80-V (3930-V). This corresponds to approximately 233-kV on the offsite grid voltage under maximum safety load conditions and is still below the normal operating voltage on the offsite power grid. Therefore, a true degraded grid voltage situation would be required to initiate the trip of 4.16-kV ESF bus feeder breakers. Conversely, the lowest voltage at which the undervoltage protection system relay would pick up is 3770-V (3850-V minus 80-V). This corresponds to approximately 227 kV on the 230-kV offsite power grid. Analysis by Generation Engineering has confirmed that this voltage is still high enough to assure that all ESF loads will be operable continuously.

Based on the above, this LCA has been reviewed, evaluated and determined to not constitute an unreviewed safety question. No new accidents are created and the probability and consequences of accidents previously considered remain unchanged or are reduced. No environmental effects or impacts result from this LCA.

SCHEDULE CONSIDERATIONS

Since this LCA was based on the NRC model Technical Specifications and its draft has been reviewed by the NRC, it is expected that prompt review and approval will be obtained on this LCA. Necessary hardware changes to comply with the attached Technical Specifications will be completed at the Trojan plant during the scheduled refueling outage in Spring 1981. Therefore, the implementation of the Technical Specifications in this License Change Application can not occur until completion of the modifications at the next refueling shutdown.

AMENDMENT CLASS

This LCA has been determined to result in a Class III amendment in accordance with the criteria of 10 CFR 170.22. This LCA involves a single issue and does not involve a significant hazard consideration. As such, it is subject to a \$4,000 fee and a check for this amount is attached to this LCA.