



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 57 TO FACILITY OPERATING LICENSE NO. NPF-1

PORTLAND GENERAL ELECTRIC COMPANY

THE CITY OF EUGENE, OREGON

PACIFIC POWER AND LIGHT COMPANY

TROJAN NUCLEAR PLANT

DOCKET NO. 50-344

INTRODUCTION AND SUMMARY

The criteria and staff positions pertaining to degraded grid voltage protection were transmitted to Portland General Electric (PGE) by NRC generic letter dated June 3, 1977. In response to this, by letters dated July 19, 1977, November 30, 1977, November 30, 1979, December 11, 1979, January 11, 1980, February 25, 1980, April 3, 1980, November 12, 1980 and January 21, 1981, the licensee proposed certain design modifications and changes to the Technical Specifications. A detailed review and technical evaluation of these proposed modifications and changes to the Technical Specifications was performed by EG&G, under contract to the NRC, and with general supervision by NRC staff. This work is reported by EG&G in "Technical Evaluation Report, Degraded Grid Protection for Class 1E Power Systems, Trojan Nuclear Plant, Docket No. 50-344" (EGG-EA-5310, Revision 1). We have reviewed this technical evaluation report and concur in the conclusion that the proposed design modifications and Technical Specifications changes are acceptable.

PROPOSED CHANGES AND EVALUATION CRITERIA

The following design modifications and Technical Specification changes were proposed by PGE:

- a. Installation of a second level of undervoltage relays on each of the two Class 1E 4160 volt buses. Each bus will have four definite time (four seconds time delay) undervoltage relays. These relays will be arranged in a one out of two taken twice coincidence logic to energize two timers, either of which will initiate tripping of the bus supply breaker. The relays will have a setpoint of 94% of nominal bus voltage with a relay-timer combined delay of 55 + 5 seconds. The following two conditions will result in tripping of Class 1E buses from offsite power:

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- (1) An SI signal is present and undervoltage below setpoint persists for four seconds.
 - (2) No SI signal and undervoltage below setpoint persists for a maximum of sixty seconds.
- b. Additions to the plant Technical Specifications including the surveillance requirements, allowable limits for the setpoint and time delay, and limiting conditions for operation have been provided by the licensee. An analysis to substantiate the limiting conditions for operation and minimum and maximum setpoint limits were included as part of the modification proposal.
- c. Subsequent to the completion of the EG&G evaluation of potential degraded voltage conditions, PGE documented modifications to the Trojan auxiliary feedwater system. These modifications potentially place additional loading on the emergency diesel generators by allowing a new non-Class 1E motor driven auxiliary feedwater pump to be powered from either emergency diesel generator. This pump is connected to a non-Class 1E bus and would only receive power from the diesel generators under conditions when no other feedwater source is available and there has been a loss of all other power sources to the affected non-Class 1E bus. To start the motor-driven auxiliary feedwater pump (1000 kw), both the non-Class 1E bus and the diesel generator bus would have to be unloaded and dedicated to this pump in order to accommodate the starting transient. After starting the auxiliary feedwater pump, ESF loads may then be restarted as diesel generator capacity permits.

A test should be performed to demonstrate that the diesel generator can accept such a load and to verify that this mode of operation will not degrade the Class 1E power system below an acceptable level. The test should include the following:

1. Insure that this loading will not cause spurious operation of the undervoltage relays and load shedding devices.
2. Determine that this loading will not exceed the annual continuous rating of the diesel generator or its transient loading capabilities.
3. Establish a margin between the motor-driven auxiliary feedwater pump loading and the continuous full load rating of the diesel generator.
4. Determine what selected loads may be subsequently applied to the diesel generator after the motor-driven auxiliary feedwater pump has started, without exceeding its steady state and/or transient loading capabilities.

5. Verify that failure of the non-Class 1E motor-driven auxiliary feed-water pump will not cause damage to any connected Class 1E equipment.
6. Verify that operating procedures and restrictions have been implemented to insure that operating this pump with power from the Class 1E bus is only used as a last line of defense and under direct supervision of the shift supervisor.

PGE should report the results of this test within 60 days of its completion.

EVALUATION CRITERIA

The criteria used by EG&G in its technical evaluation of the proposed changes include GDC-17, "Electric Power Systems", of Appendix A to 10 CFR 50; IEEE Standard 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Station"; IEEE 308-1974, "Class 1E Power Systems for Nuclear Power Generating Stations"; and staff position defined in NRC generic letter to PGE dated June 3, 1977.

CONCLUSION

We have reviewed the EG&G Technical Evaluation Report and concur in its findings that:

- (1) The proposed degraded grid modifications will protect the Class 1E equipment and systems from sustained degraded voltage of the offsite power source.
- (2) The proposed changes to the Technical Specifications meet the criteria for periodic testing of protection systems and equipment are acceptable.
- (3) Load shedding is being maintained once the diesel generators are supplying their respective buses. The licensee's bases for this is acceptable.

Environmental Consideration

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: April 16, 1981

Attachment:
Technical Evaluation Report
(EGG-EA-5310, Rev. 1)

EGG-EA-5310
Revision 1

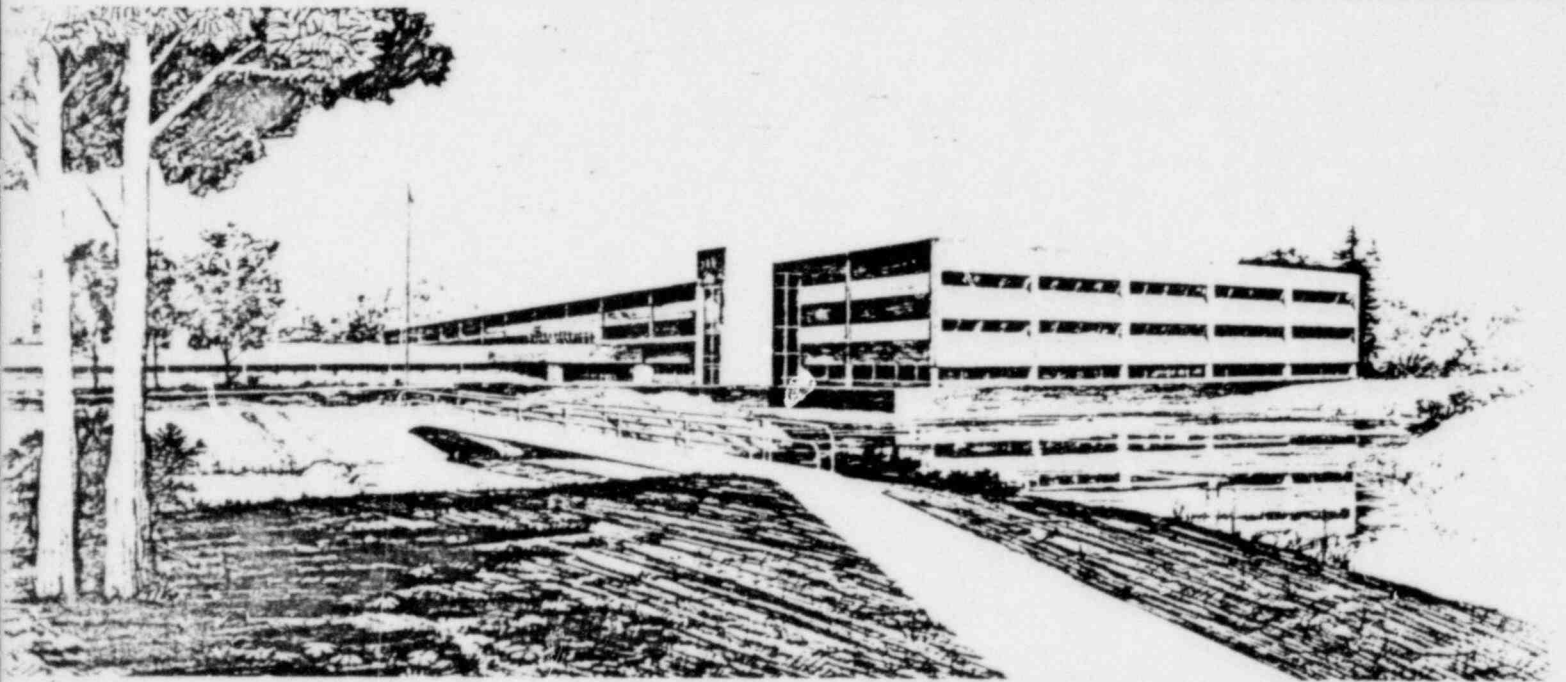
January 1981

TECHNICAL EVALUATION REPORT, DEGRADED GRID
PROTECTION FOR CLASS 1E POWER SYSTEMS, TROJAN
NUCLEAR PLANT, DOCKET NO. 50-344

C. J. Cleveland

U.S. Department of Energy

Idaho Operations Office • Idaho National Engineering Laboratory



This is an informal report intended for use as a preliminary or working document

DUPLICATE

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 **EG&G** Idaho