



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 61 TO FACILITY OPERATING LICENSE NO. NPF-14 AND

AMENDMENT NO. 32 TO FACILITY OPERATING LICENSE NO. NPF-22

PENNSYLVANIA POWER & LIGHT COMPANY

SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2

DOCKET NOS. 50-387 AND 50-388

1.0 INTRODUCTION

The Pennsylvania Power & Light Company, by letters dated February 10, March 4, June 24, August 29, and October 1, 1986, and January 21, 1987, has proposed Technical Specification changes to include a fifth (E) diesel generator for Susquehanna, Units 1 and 2.

The Susquehanna Steam Electric Station, Units 1 and 2 provides four diesel generators that are shared between the two units. The Technical Specifications permit a diesel generator to be inoperable for 72 hours and after 72 hours, if the diesel is not returned to service, a two unit shutdown is required. A fifth diesel generator is being added as a replacement and will have the capability of supplying the emergency loading for any one of the four existing diesel generators. The purpose of the fifth diesel generator is to allow maintenance to be performed on any one of the four existing diesel generators without necessitating any unit shutdown.

The fifth diesel generator building is a Seismic Category 1, two-story structure consisting primarily of reinforced concrete walls, floor slab, and roof. The diesel generator pedestal is also constructed of reinforced concrete. Unlike other Category 1 buildings, there are no masonry walls or high energy pipelines in the facility. Absence of the high energy pipelines significantly lowers the design loads and load combinations imposed on the structure.

Fire protection for Diesel Generator E Building consists of a pre-action sprinkler system installed throughout the 656 ft. 6 in. and 675 ft. 6 in. levels. Automatic fire detection capability is installed throughout the building (including the 708 ft. level) and consists of ionization, infrared (flame) and heat detectors. All three types of detectors are tied together to alarm in the control room and to open the automatic valve that admits water to the pre-action sprinkler system. Manual fire fighting capability is provided by hand held extinguishers and standpipe and hose stations located throughout the building.

In both buildings engine exhaust is so arranged as to minimize the possibility of exhaust being drawn into the combustion/ventilation air supply intake openings to the outside.

A separate battery back-up power supply is provided for the fire detection systems in both buildings to assure continuous detection capability, even

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with the loss of off-site power. Fire Detection Systems for both buildings are connected to the plant multiplexing systems which alarm in the control room.

Bulk fuel oil supply consists of outside buried storage tanks. Four 50,000 gallon capacity tanks provide the primary supply for each of the A, B, C, & D diesel generators. A new 80,000 gallon capacity tank provides the primary supply for the new E diesel generator. Transfer pumps, piping and valves are so arranged that each bulk storage tank normally supplies fuel to a single diesel. However, necessary valves and piping permit filling any engine day tank from any bulk fuel storage tank. The five bulk storage tanks are not themselves interconnected.

Because the presence of a fifth diesel display instrumentation in the control room could cause unnecessary confusion in a four-division (channel) system, the fifth diesel generator utilizes the same metering and controls used for any one of the existing four diesel generators that is being replaced by the fifth diesel. The use of a transfer switching system reduces electrical wiring separation problems, conserves space and minimizes changes in the main control room.

The transfer switches in the specific transfer panels in the fifth diesel generator building are used to select the path to the controls of the specific diesel generator to be replaced. The transfer switch at the individual transfer panel in each existing diesel generator building is used to transfer the controls of the specific diesel generator to the fifth diesel generator.

New alarms and indications are dedicated to the fifth diesel generator facility and are located on the main control board in the control room. The alarm devices annunciate the 4.16 kv systems, DC systems, control switches not properly aligned, building sump level high, and HVAC failure. A series of five indicating lights is provided to indicate the replacement status of the fifth diesel generator and whether or not it is aligned as replacement for the diesel generator A, B, C, or D, respectively.

The electrical system design adopted for the fifth diesel generator for Susquehanna was not reviewed by the staff, because the licensee elected to modify the facility under the provisions of the Commission's regulation 10 CFR 50.59.

2.0 EVALUATION

Structural Design Evaluation

The criteria used in the analysis, design, and construction of the fifth diesel generator building to account for anticipated loadings and postulated conditions that may be imposed upon each structure during its service life-time are in conformance with established criteria, codes, standards, and specifications acceptable to the staff.

The use of these criteria, as defined by applicable codes, standards, specifications, the loads, loading combinations, the design and analysis procedures, the structural acceptance criteria, the materials, and quality control, provide reasonable assurance that, in the event of winds, tornadoes, earthquakes and various postulated accidents occurring within the structures, the structures will withstand the specified design conditions without impairment of structural integrity or the performance of required safety functions. Conformance with these criteria, codes, specifications, and standards constitutes an acceptable basis for satisfying, in part, the requirements of 10 CFR 50, Appendix A, General Design Criteria 2 and 4.

Fire Protection Evaluation

The design and installation of the fifth diesel generator conforms to applicable NRC fire protection guidelines and is acceptable. In addition, we find the proposed changes to Technical Specification pages 3/4 3-80, 7-19, and 7-24 for Unit 1, and 3/4 3-81, 7-21, and 7-26 for Unit 2 meet the staff's acceptance criteria and are acceptable.

Electrical Systems

The fifth diesel electrical systems design was analysed by the licensee in accordance with the requirements of the Commission's regulations 10 CFR 50.59. The staff has reviewed the proposed preoperational testing and Technical Specification changes (to incorporate the fifth diesel generator) against the preoperational testing and current Technical Specifications previously accepted for the four existing diesel generators. The staff has concluded that the fifth diesel generator will be OPERABLE in accordance with the surveillance test program specified in the proposed Technical Specifications consistent with the Technical Specifications for the four existing diesel generators, except as evaluated below.

1. Specification 3.8.1.1

The footnote for this specification has been revised to allow the removal of an OPERABLE diesel generator from service for a period of eight hours, when substituting the fifth diesel generator to the Class 1E distribution system, without declaring an LCO. If, however, the substitution cannot be successfully completed in eight hours, an LCO must be declared and the appropriate ACTION followed with the time requirements in the ACTION statement being measured from the time of unavailable diesel generator to the emergency power system.

When an OPERABLE diesel generator is being substituted by the fifth diesel generator, testing of the remaining operable three diesel generators is not required. Immediate testing of diesel generators is required when one diesel generator becomes inoperable due to equipment failures, in order to detect any potential common cause failures and to assure power supply to safety related equipment required for safe shutdown of the plant during accident conditions. Since, however, an OPERABLE diesel generator is being removed from service for replacement,



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testing of the remaining operable three diesel generators is not needed. The licensee has committed that, if substitution of the diesel generator cannot be successfully completed in eight hours, LCO will be declared and the appropriate ACTION(s) followed with the time being measured from the time substitution began. Therefore, this revision does not impact safety and does not degrade availability of diesel generators and is acceptable.

2. Specification 4.8.1.1.3

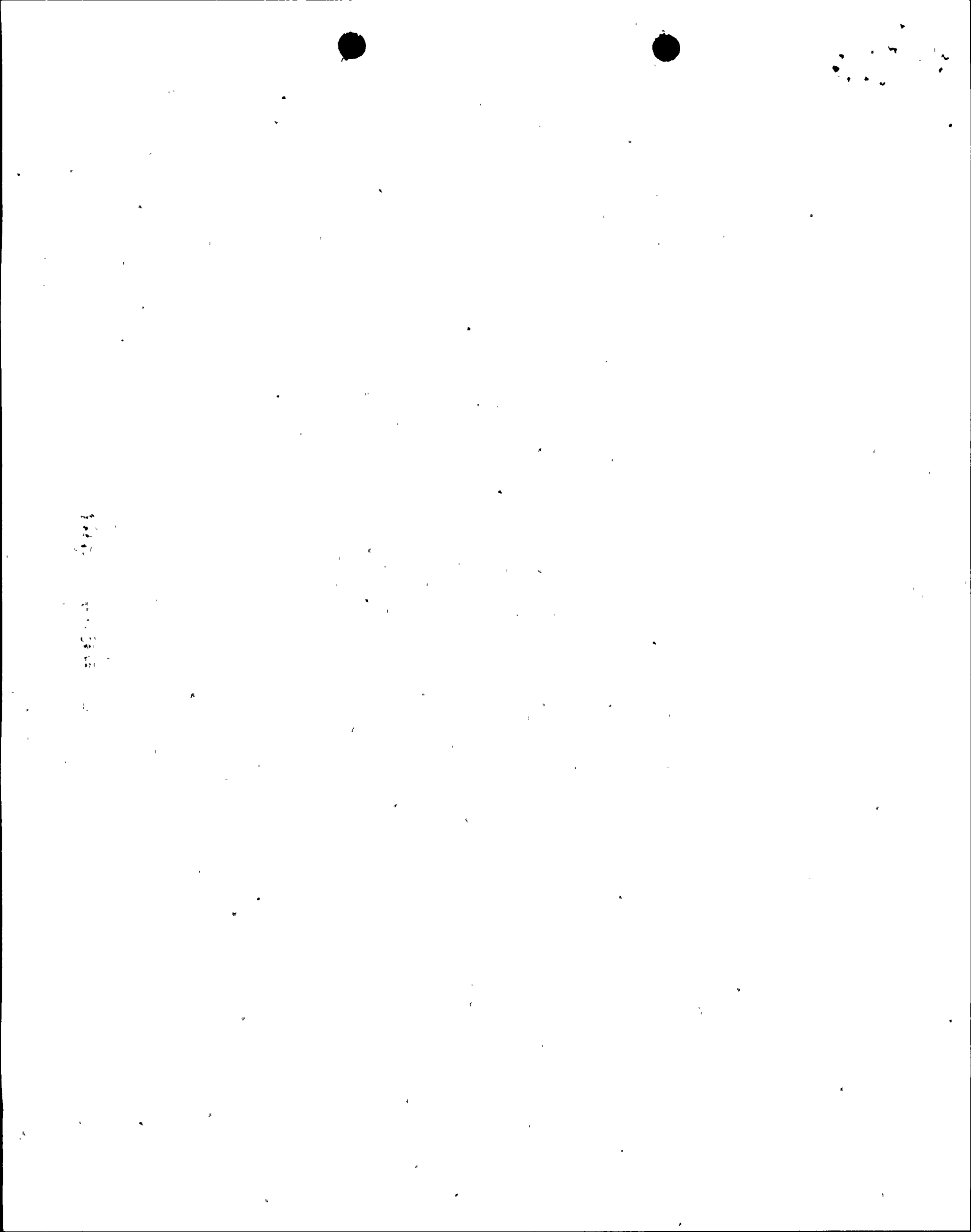
This is a new section of the Technical Specifications and delineates the surveillance test requirements for demonstrating that the fifth diesel generator is OPERABLE. The surveillance test requirements for the fifth diesel generator are equivalent to the requirements in the current Technical Specifications (T.S.) and are acceptable including the following differences:

- (a) Starting test of the diesel by, i) simulated loss of offsite power; ii) simulated loss of offsite power in conjunction with an engineered safety feature (ESF) actuation test signal; and iii) an ESF actuation signal alone, will not be conducted for the fifth diesel generator every 31 days. Only manual start of the diesel will be performed every 31 days.

The testing facility for the fifth diesel generator does not provide the capability to simulate an ESF actuation signal and a loss-of-offsite power signal. Therefore, when the fifth diesel generator is not aligned to the Class 1E system, starting can only be accomplished by a manual start signal. This test verifies that the required voltage and frequency are automatically attained within acceptable time limits. The tests not conducted every 31 days will be performed during the 18 month surveillance interval.

- (b) The fifth diesel generator which has a full load carrying capacity of 5000 kw will be testing to 4000 kw of the continuous rating consistent with the surveillance test requirements of the existing diesel generators.
- (c) The current T.S. requires verification that the loading sequence timer is operable within its setpoint. Since the timer is separate from the diesel generator, this verification is not necessary for the fifth diesel generator test program. Therefore, omission of this test from the surveillance requirements is acceptable.

- 3. In its letter dated January 21, 1987, the licensee stated that the fifth diesel can not be loaded with emergency loads while the units are at power. Therefore, the preoperational test program requirement to verify a diesel generator's capability to synchronize with an off-site power source can not be met without plant shutdown. There are no planned plant shutdowns prior to initial startup of the fifth diesel



generator. The licensee, therefore, requested an exception from the offsite power synchronization surveillance requirement (Section 4.8.1.1.3.d.6.b.iv) for preoperational testing of the fifth diesel.

The licensee stated that the requested exception will not degrade the reliability of fifth diesel. Alternate tests which are judged to be equivalent to the tests for which exception is requested will be performed as follows.

The fifth diesel generator will be loaded with simulated emergency loads on the load bank. With the fifth diesel generator in the emergency mode, the test will demonstrate that the fifth diesel generator can synchronize to offsite power by voltage and frequency of the diesel generator side through an offsite power breaker while loaded.

After the synchronization check is satisfied, the offsite power breaker can close. Immediately upon closure of the offsite power breaker, the diesel generator output breaker will receive a trip signal. This will demonstrate the ability of the fifth diesel generator to reject a load equal to the emergency load rating without tripping and then to return to a standby status.

Based on our review of the alternate surveillance testing and justification to demonstrate compliance, the staff has concluded that exception from the surveillance test 4.8.1.1.3.d.6.b.iv) during preoperational testing and proposed alternate testing is acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

These amendments involve a change in the installation and use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes in surveillance requirements. The staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that these amendments involve no significant hazards consideration, and there has been no public comment on such finding. Accordingly, these amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement nor environmental assessment need be prepared in connection with the issuance of these amendments.

4.0 CONCLUSION

The Commission made a proposed determination that the amendments involve no significant hazards consideration which was published in the Federal Register

(51 FR 33956) on September 24, 1986, and (52 FR 4416) on February 11, 1987, and consulted with the state of Pennsylvania. No public comments were received, and the state of Pennsylvania did not have any comments.

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of these amendments will not be inimical to the common defense and security nor to the health and safety of the public.

Principal Contributors: Mohan C. Thadani, Project Directorate No. 3, DBL
S. Rhow, EICSB, DBL
D. Notley, BWPSB, DBL
S. Kim, BWEB, DBL

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