



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 92 TO FACILITY OPERATING LICENSE NO. NPF-57

PUBLIC SERVICE ELECTRIC & GAS COMPANY

ATLANTIC CITY ELECTRIC COMPANY

HOPE CREEK GENERATING STATION

DOCKET NO. 50-354

1.0 INTRODUCTION

By letter dated October 7, 1995, as supplemented by letter dated October 27, 1995, the Public Service Electric & Gas Company (the licensee) submitted a request for a change to the Hope Creek Generating Station (HCGS), Technical Specifications (TSs). The proposed change to Hope Creek TS 4.8.1.1.2, "A.C. Sources - Operating," would replace the reference to an upper voltage and frequency band for the 10-second, Emergency Diesel Generator (EDG), starting time test with a minimum required voltage and frequency that must be attained within 10 seconds. The proposed change to TS 4.8.1.1.2 also includes several related changes as follows: (1) the requirement for an EDG to achieve 514 rpm, within 10 seconds following a start signal during testing, would be eliminated, (2) the term "standby" would replace the term "ambient" in describing the EDG test prestart condition, and (3) the term "must" would be replaced with the term "may" in describing the use of manufacturers recommendations for EDG loading. By letter dated October 27, 1995, the licensee revised their proposed TS changes in response to comments from the NRC staff.

2.0 DISCUSSION

The HCGS is equipped with four Emergency Diesel Generators (EDGs) that provide on-site AC power for the four 4160 volt electrical safety divisions. At the present time, TS 4.8.1.1.2 requires that the EDGs be routinely demonstrated to be operable by starting the EDGs and observing that they reach 4160 volts (plus or minus 420 volts) and 60 Hz (plus or minus 1.2 Hz) within 10 seconds of a start.

Demonstrating that the EDGs achieve the required voltage and frequency bands, within 10 seconds of a start signal, has proved to be difficult for the licensee to consistently achieve. Recent licensee EDG test experience has shown that the EDGs tend to overshoot the upper band for required voltage (4580 volts) and frequency (61.2 Hz) and then quickly return to the required voltage and frequency bands. Since the licensee has interpreted the TS to require that the EDG achieve stability within the voltage and frequency bands, within 10 seconds of the start signal, a number of EDG tests were initially found to be failures in that more than 10 seconds were required. Since failure of the 10-second test results in the EDG being declared inoperable,

with subsequent remedial testing of the EDGs, the existing TS 4.8.1.1.2 has resulted in excessive adjustment of the EDG governors and voltage regulators and excessive retesting of the EDGs. Accordingly, the licensee has proposed that TS 4.8.1.1.2 be changed to require that the EDG achieve a minimum value of voltage and frequency within 10 seconds of a start signal. A voltage of 3950 volts and a frequency of 58.8 Hz were proposed in that they represent the minimum values that must be achieved for the EDG to accept loads.

The licensee has also proposed several related changes to TS 4.8.1.1.2 as follows: (1) the requirement for an EDG to achieve 514 revolutions per minute (rpm), within 10 seconds following a start signal, during testing, would be eliminated, (2) the term "standby" would replace the term "ambient" in describing the EDG test prestart condition, and (3) the term "must" would be replaced with the term "may" in describing the use of manufacturers recommendations for EDG loading.

3.0 EVALUATION

With regard to proposed elimination of the upper band for voltage and frequency, currently required for EDG testing, the NRC staff has been aware that EDGs routinely overshoot this upper band when tested in the unloaded condition. This overshoot condition is due mostly to the considerable rotational inertia of the EDG and the initial response of the governor under unloaded conditions. Under realistic conditions, however, the emergency loads would be accepted by the EDG near the lower voltage/frequency band and the resultant effect, similar to applying a brake to a spinning wheel, would quickly reverse the tendency to overshoot the upper voltage/frequency band.

As part of efforts related to generic improvements to the Standard Technical Specifications (STS), the NRC staff has agreed to delete the upper voltage and frequency bands for the initial 10-second period following the fast start during the no-load EDG testing. The NRC staff is concerned, however, that failure to ensure that EDG voltage regulator and governor components are properly adjusted could result in the EDG becoming inoperable. Improperly adjusted governor or voltage regulator components might be detected by failure of the EDG to achieve steady state operation in the unloaded condition. To enhance the likelihood that these conditions will be detected, the licensee has proposed that a statement be added to the TS Bases as follows: "...PSE&G will monitor and trend the actual time to reach steady state operation as a means of ensuring there is no voltage regulator or governor degradation which could cause an EDG to become inoperable." Based upon the above, the NRC staff finds the proposed change to TS 4.8.1.1.2, which deletes the upper voltage and frequency bands for the EDG 10-second test, to be acceptable.

With regard to the additional proposed changes to TS 4.8.1.1.2, the staff agrees with the license that the requirement that the EDG achieve a specified 514 rpm, within 10 seconds of the start signal, is unnecessary. Since the diesel engine is directly coupled to the generator, the generator output frequency is directly proportional to the engine speed in rpm. Accordingly,

the minimum frequency requirement, required to be achieved within 10 seconds of the start signal, is indicative of adequate diesel engine speed, and thus the 514 rpm requirement can be deleted from TS 4.8.1.1.2.

The NRC staff also agrees that the term "standby" should replace the term "ambient" in describing the EDG test prestart condition. The term "ambient" implies that the diesel engine is at the same temperature as the surrounding air temperature prior to starting. In fact, the diesel engine is maintained in a prewarmed ("standby") condition to minimize the wear on the engine during starting. In this regard, the word "other" in the same context as "ambient" has been proposed for deletion in that all of the associated engine tests should be conducted in the prelubed/prewarmed condition to avoid excessive engine wear. The NRC staff agrees with this change. The NRC staff agrees that the use of EDG prewarming is important in minimizing engine wear due to starting. Accordingly, the proposed change to TS 4.8.1.1.2, which substitutes the term "standby" for the term "ambient" and deletes the word "other" is acceptable.

Finally, the NRC staff agrees that the term "must" should be replaced with the term "may" in describing the use of manufacturers recommendations for EDG loading. The NRC staff believes that alternatives to manufacturers' recommendations for EDG loading, where such loading is required by the TS, may be determined by the licensee, as reflected by replacing the term "must" with the term "may." Accordingly, the proposed change to TS 4.8.1.1.2, which replaces the term "must" with the term "may" with regard to EDG loading, is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New Jersey State Official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes the surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent 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 the amendment involves no significant hazards consideration, and there has been no public comment on such finding (60 FR 58405). Accordingly, the amendment meets 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 or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Date: February 6, 1996