



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 98 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 25, 1996, as supplemented by letters dated December 4, 1996, and January 24, 1997, the Public Service Electric and Gas Company (PSE&G) requested an amendment to the Hope Creek Generating Station (HCGS) Facility Operating License. The proposed change to Hope Creek Technical Specification (TS) 3/4.1.3.5, "Control Rod Scram Accumulator," would: 1) permit a separate entry into a TS action statement for each inoperable control rod; 2) provide more specific applicability for required actions in Operational Condition 1 or 2 with one inoperable control rod scram accumulator (reactor pressure of ≥ 900 psig would be specified); 3) provide more specific actions (verify charging water pressure) for two or more inoperable control rod scram accumulators when reactor pressure is ≥ 900 psig; 4) provide more specific actions when reactor pressure is < 900 psig and one or more control rod scram accumulators are inoperable (verify insertion of control rods associated with inoperable accumulators and verify that charging water header pressure is ≥ 940 psig); 5) provide specific actions in Operational Condition 5 with one or more withdrawn control rods inoperable; and 6) eliminate the requirements to perform an 18-month channel functional test of the leak detectors and the 18-month channel calibration of the pressure detectors.

The December 4, 1996, and January 24, 1997, supplements did not change the initial proposed no significant hazards consideration determination.

2.0 DISCUSSION

The HCGS Reactor Pressure Vessel utilizes bottom-entry control rod drives to normally position, or scram, the control rods. Each control rod drive is equipped with a Hydraulic Control Unit (HCU) as described in Section 4.6.1.2.4.3 of the HCGS Updated Final Safety Analysis Report (UFSAR). Each HCU contains a scram accumulator, valves, a filter, instrumentation, electrical connections, and associated piping. Section 4.6.1.2.4.3 of the HCGS UFSAR provides the following information concerning the scram accumulators:

The scram accumulator stores sufficient energy to fully insert a control rod at lower [reactor pressure] vessel pressures. At higher vessel pressures, the accumulator pressure is assisted or supplemented by reactor vessel pressure. The accumulator is a hydraulic cylinder with a free floating piston. The piston separates the water on top from the nitrogen below. A check valve in the accumulator charging line prevents loss of water pressure if the supply pressure is lost.

During normal plant operation, the accumulator piston is seated at the bottom of the cylinder. Loss of nitrogen decreases the nitrogen pressure, actuating a pressure switch and sounding an alarm in the main control room.

To ensure that the accumulator is always able to produce a scram, it is continuously monitored for water leakage. A float type level switch actuates an alarm if water leaks past the piston barrier and collects in the accumulator instrumentation block.

The scram accumulators are maintained in the "charged" condition by charging water flow from the control rod drive pumps, and are thus independent of reactor vessel pressure. The scram accumulators normally "float" at the discharge pressure of the control rod drive pumps, approximately 1500 psig.

The licensee's application dated October 25, 1996 as supplemented by letters dated December 4, 1996 and January 24, 1997, seeks to replace selected requirements of TS 3/4.1.3.5 with alternative requirements consistent with the NRC's Standard Technical Specifications, NUREG-1433, Revision 1, for the scram accumulators.

3.0 EVALUATION

3.1 Limiting Conditions for Operation

The first proposed change to TS 3.1.3.5 would change the requirement that, "All control rod scram accumulators shall be OPERABLE" to the requirement that, "Each control rod scram accumulator shall be OPERABLE." In addition, the following note would be inserted in the TS: "Separate condition entry is allowed for each control rod." The purpose of this change is to allow each scram accumulator to be treated, from an operability standpoint, as an independent piece of equipment. Since each control rod drive is equipped with an independent scram accumulator, and because the TSs establish action statements that provide for remedial action to establish an equivalent level of safety when one or more scram accumulator becomes inoperable, it is acceptable to treat each scram accumulator as an independent piece of equipment. These changes adopt the wording from NUREG-1433, Revision 1, TS 3.1.5 and are acceptable.

The second proposed change would add an additional restriction to the Action Statement of TS 3.1.3.5a.1. At the present time, this Action Statement applies at any time, in OPERATIONAL CONDITION 1 or 2 (power operation and

startup, respectively), "With one control rod scram accumulator inoperable." The proposed Action Statement would be further restricted by applying to a condition "With one control rod scram accumulator inoperable and reactor pressure greater than or equal to 900 psig." Since higher vessel pressures assist the scram function, the proposed change to TS 3.1.3.5a.1 provides additional assurance that a control rod scram will be accomplished with an inoperable scram accumulator. The licensee has also proposed an additional remedial action to be taken when one scram accumulator is inoperable. If the scram accumulator cannot be restored to operable status within 8 hours, the associated control rod must be declared inoperable, inserted, and disarmed. This remedial action completes the safety function of the inoperable scram accumulator. These two proposed changes to TS 3.1.3.5a.1 adopt the wording from NUREG-1433, Revision 1, TS 3.1.3, "Control Rod OPERABILITY," and TS 3.1.5, "Control Rod Scram Accumulators," and are acceptable.

In the third proposed change, the licensee is proposing to provide more specific actions (verify charging water pressure) for two or more inoperable control rod scram accumulators when reactor pressure is ≥ 900 psig. At the present time, TS 3.1.3.5a.2 addresses the inoperability of two or more scram accumulators at reactor pressures ≥ 900 psig and at < 900 psig. The proposed TS would divide the existing TS into two parts, TS 3.1.3.5a.2 (for reactor pressures ≥ 900 psig) and TS 3.1.3.5a.3 (for reactor pressures < 900 psig). With regard to proposed TS 3.1.3.5a.2 the licensee is proposing that:

With two or more control rod scram accumulators inoperable and reactor pressure ≥ 900 psig,

- a) Within 20 minutes of discovery of this condition concurrent with charging water pressure < 940 psig, restore charging water header pressure to ≥ 940 psig, otherwise place the mode switch in the shutdown position**, and
- b) Within one hour insert the associated control rods, declare the associated control rod inoperable and disarm the associated control valves either electrically or hydraulically by closing the drive water and exhaust isolation valves.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

The proposed, new footnote (**), states that the requirement, to place the mode switch in the shutdown position is, "Not applicable if all inoperable control rod scram accumulators are associated with fully inserted control rods." Under the currently applicable TS for reactor pressure ≥ 900 psig, the licensee is required to verify that at least one control rod drive pump is operating by inserting at least one control rod at least one notch. If no control rod drive pump is operating, the licensee is required to start at least one control rod drive pump. These existing TS are equivalent to the proposed TS in that the establishment of a charging water pressure of ≥ 940 psig requires the operation of at least one control rod drive pump. Part "b", which requires that control rods that are declared inoperable due to an

inoperable scram accumulator be fully inserted and electrically or hydraulically disarmed and the alternate remedial action, "Otherwise, be in at least HOT SHUTDOWN within the next 12 hours." are the same as the existing TSs. Finally, the proposed footnote (**) is acceptable in that it is the same as the wording in NUREG-1433, Revision 1, TS 3.1.5D.1. There is no need to place the mode switch in the shutdown position, for fully inserted control rods associated inoperable scram accumulators, since there is no additional safety function for the scram accumulators after the associated control rod is fully inserted. The NRC staff also concludes that proposed TS 3.1.3.5a.2 is consistent with the wording from NUREG-1433, Revision 1, TS 3.1.3 and TS 3.1.5. Accordingly, the proposed TS 3.1.3.5a.2 is acceptable.

For reactor pressures < 900 psig, the licensee has proposed the following TS 3.1.3.5a.3:

With one or more control rod scram accumulators inoperable and reactor pressure < 900 psig,

- a) Immediately upon discovery of charging water header pressure < 940 psig, verify all control rods associated with inoperable accumulators are fully inserted otherwise place the mode switch in the shutdown position**, and
- b) Within one hour insert the associated control rods, declare the associated control rod inoperable and disarm the associated control valves either electrically or hydraulically by closing the drive water and exhaust isolation valves.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

The footnote (**) is as already described above. Under the current TS associated with the operability of scram accumulators at reactor pressure < 900 psig, the licensee is required to place the mode switch in the shutdown position. As noted previously, insertion of control rods associated with inoperable scram accumulators is an acceptable alternative to placing the mode switch in the shutdown position. There is no need to place the mode switch in the shutdown position, for fully inserted control rods associated inoperable scram accumulators, since there is no additional safety function for the scram accumulators after the associated control rod is fully inserted. Part "b", which requires that control rods that are declared inoperable due to an inoperable scram accumulator be fully inserted and electrically or hydraulically disarmed and the alternate remedial action, "Otherwise, be in at least HOT SHUTDOWN within the next 12 hours." are the same as the existing TSs. The NRC staff also concludes that proposed TS 3.1.3.5a.3 is consistent with the wording from NUREG-1433, Revision 1, TS 3.1.3 and TS 3.1.5. Accordingly, the proposed TS 3.1.3.5a.2 is acceptable.

The licensee has also proposed changes to TS 3.1.3.5b which applies to scram accumulators in OPERATION CONDITION 5 (refueling). At the present time, TS 3.1.3.5b requires:

1. With one withdrawn control rod with its associated scram accumulator inoperable, insert the affected control rod and disarm the associated directional control valves within one hour either:
 - a) Electrically, or
 - b) Hydraulically by closing the drive water and exhaust water isolation valves.
2. With more than one withdrawn control rod with the associated scram accumulator inoperable and no control rod drive pump operating, immediately place the reactor mode switch in the shutdown position.

The licensee has proposed replacing the above requirements with the following:

1. With one or more withdrawn control rods inoperable, upon discovery immediately initiate action to fully insert inoperable withdrawn control rods.

For the purpose of the above requirement, a footnote indicates that the requirement applies, at least, to the scram accumulator associated with a withdrawn control rod. The licensee's proposed change to TS 3.1.3.5b adopts the wording of NUREG-1433, Revision 1, TS 3.9.5, "Control Rod OPERABILITY - Refueling." The proposed requirement assures that withdrawn control rods with inoperable accumulators are immediately inserted, thus immediately obviating the need for the scram accumulator to perform its safety function; the NRC Staff considers this action, alone, to be adequate under the applicable conditions. Accordingly, the proposed changes to TS 3.1.3.5b are acceptable.

3.2 Surveillance Requirements

The requirements of TS 4.1.3.5 provide surveillance requirements for the scram accumulators. These surveillance requirements include: (1) verification of scram accumulator pressure every 7 days per TS 4.1.3.5a and (2) Channel Function Test of leak detectors and Channel Calibration of the pressure detector instrumentation, every 18 months per TS 4.1.3.5b. The licensee has requested that the 18-month Channel Functional Test and Channel Calibrations, of TS 4.1.3.5b, be deleted; these surveillances are not required by the TS in NUREG-1433, Revision 1.

The 7-day verification of scram accumulator pressure involves a local pressure gauge, PI-131, and would be retained in the proposed TS 4.1.3.5. The licensee proposes to delete the surveillance requirements for the leak and pressure detection instrumentation (LSM-129 and PSL-130), from TS 4.1.3.5. These instruments are control room indications which provide a common "trouble" alarm when the instruments exceed their alarm setpoints. The instruments would still undergo required surveillance testing under plant procedures.

The NRC staff concludes that the 7-day verification of scram accumulator pressure provides an adequate indication of the readiness of the scram accumulators to provide their safety function. The licensee will continue to provide the necessary testing of the scram accumulator control room indications. Any change in this commitment would require an analysis under the requirements of 10 CFR 50.59, "Changes, tests, and experiments." Accordingly, the proposed deletion of TS 4.1.3.3b 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 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 (61 FR 64394). 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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