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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 86 TO FACILITY OPERATING LICENSE NO. DPR-63

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-220

1.0 INTRODUCTION

In a letter dated March 21, 1984 as supplemented and clarified in letters dated December 31, 1985 and April 24, 1986, Niagara Mohawk Power Corporation (the licensee) requested an amendment to Appendix A of Facility Operating License No. DPR-63 for the Nine Mile Point Nuclear Station, Unit No. 1. The amendment would modify the Technical Specifications (TS) to: (1) incorporate solenoid actuated pressure relief valve setpoints into the surveillance requirements; (2) reference acoustic monitors as the primary means of determining if a valve has opened; and (3) remove the word "low" as it references reactor pressure for the valve surveillance tests. These changes affect TS 4.1.5 and 4.2.9.

2.0 DISCUSSION

By letter dated March 21, 1984, the licensee proposed changes to the existing TS 4.1.5.a, 4.1.5.b, 4.2.9.a and 4.2.9.b. These TS are the surveillance requirement for the dual function, solenoid-actuated electromatic relief valves for the reactor coolant system. These six relief valves provide: (1) automatic depressurization from high pressure during a small break loss of-coolant accident and (2) prevent unnecessary safety relief valve actuation by providing pressure relief for over pressurization at specific pressure setpoints. TS 4.1.5 establishes the required surveillance for the automatic depressurization function and TS 4.2.9 establishes the required surveillance for the pressure relief function.

Although the current TS state that the testing of the relief valves required in TS 4.1.5 and 4.2.9 is performed at low reactor pressure, the actual tests are conducted at an operating pressure in excess of 950 psig. Therefore, because the reference in the TS to a low reactor pressure is ambiguous, the licensee proposed changes to TS 4.1.5 and 4.2.9. This Safety Evaluation addresses the following issues: (1) the acceptability of the tests at an operating pressure in excess of 950 psig because the existing TS state that these tests should be done at low pressure and (2) the acceptability of the proposed TS changes. These are discussed in Section 3.0 below.

3.0 EVALUATION

3.1 Acceptability of Test Pressure

The licensee explained the testing of the relief valves to the NRC for each of its dual functions in its letters dated December 31, 1985, and April 24, 1986, and during a telephone conference held on June 4, 1986. The relief valves are individually manually opened with the reactor at nominal operating pressure and generating steam. This would be the environment that the relief valves would be in if required to operate in either of its dual functions during normal power operation. The test also demonstrates that the valves would open at nominal reactor pressure.

The licensee presented that reactor pressure is maintained during relief valve testing by pressure regulator controls. This is to prevent unnecessary rapid depressurization of the reactor coolant system during the test and any possible damage to the valves when reseating. The relief valves are spring closed, therefore, reactor pressure acts to allow the valves to close with less impact than at lower reactor pressures.

The licensee further presented that either the mechanical or electrical pressure regulator controls reactor pressure during reactor startup, operation, and shutdown. The mechanical pressure regulator is used during reactor startup and shutdown and the electrical pressure regulator is used at reactor operating pressures in excess of 950 psig. The mechanical

pressure regulator response to changing pressure conditions is significantly slower than that of the electrical pressure regulator. Therefore, the test provides operability verification at reactor operating pressures in excess of 950 psig.

The licensee stated that during each refueling outage, the setpoint for relief valve actuation is verified as well as the control logic associated with the automatic depressurization function. Verification, however, is up to the solenoid opening the valve. During initial startup stages, while reactor pressure is increasing before the valves are tested, their operability has not been positively verified. Redundant equipment is provided by design to ensure that the safety functions of the solenoid actuated pressure relief valves will be accomplished. These include the reactor coolant safety valves for overpressure protection and the high pressure coolant injection system (a mode of the feedwater system) for a small break LOCA. As indicated in the Final Safety Analysis Report (FSAR), the ADS in conjunction with the core spray system may be required for breaks of less than 0.3 ft^2 with no feedwater available. The Fifth Supplement to the FSAR, however, indicates that for small breaks of this size ample protection is provided by the high pressure coolant injection system. In addition, prior to startup or early in the startup phase, the core spray system, control rod drive coolant injection system and offsite power systems are required to be operable and would be available to remove decay heat. Furthermore, use of the main steam bypass system would be available to provide pressure relief until vessel isolation occurred on low reactor vessel level given a small break LOCA.

The licensee addressed loads generated by the relief valves being opened by letter dated April 24, 1986. During a relief valve actuation, dynamic loads are transmitted to the relief valve, main steam line, discharge line, vacuum breakers, submerged structures in the suppression pool, and the torus and attached piping. Generally these dynamic loads would increase in proportion to reactor pressure. Each of the components affected has been evaluated previously for such an event at greater than normal reactor pressures. These evaluations showed that stresses were within allowable limits.

The licensee also explained that a second loading condition may arise from the potential for human error, electrical failure, or mechanical failure, which leaves the relief valve open, resulting in rapid vessel depressurization and suppression pool heatup. As discussed in the FSAR, consequences of a stuck open relief valve have been previously addressed and demonstrated to meet the applicable limits for Nine Mile Point Unit 1.

The staff has reviewed the licensee's testing of the subject relief valves at nominal operating reactor pressure. The staff concludes that the procedure is acceptable because (1) the response of the mechanical pressure regulator (used at low pressure) to changing pressure conditions is significantly slower than that of the electrical pressure regulator (used at reactor operating pressure), (2) adequate redundant safety systems are provided to prevent reduction in the margin of safety given the loss of the ADS function during startup, (3) dynamic loads and suppression pool heatups associated with high pressure testing have been shown to be acceptable and (4) testing at nominal operating pressure enhances plant safety by assuring the valves can operate under normal operating conditions.

3.2 Proposed Technical Specifications

The first proposed change regards incorporation of the relief valve setpoints into the surveillance requirements. This will add a new TS 4.2.9.a, change the designation for the existing TS 4.2.9.a to TS 4.2.9.b, revise existing TS 4.2.9.b, and change the designation of the existing TS 4.2.9.b to TS 4.2.9.c. This change is adding the new TS 4.2.9.a which specifies the setpoints for the six relief valves and revises the existing TS 4.2.9.b to require that "at least once during each operating cycle, relief valve setpoints shall be verified" in place of the existing TS 4.2.9.b, "at least once during each operating cycle with the reactor at low pressure automatic initiation shall be demonstrated." The verification of the setpoints and the manual operation of the valves in new TS 4.2.9.b demonstrates automatic initiation of the relief valve per the existing TS 4.2.9.b. As was discussed with the licensee, the verification of the setpoint is performed

separately up to the actuation solenoid and the manual operation of the valve verifies the operation of the solenoid. The frequency of the surveillance is not changed. The demonstration of automatic initiation in existing TS 4.2.9.b is not changed; however, this demonstration which is in two steps is delineated as two steps in the new TS. The relief valve setpoints are currently in the bases of the TS. The setpoints are being added into the surveillance requirement section of the TS. No technical changes were made to the surveillance requirements in the existing TS 4.2.9, therefore, these changes are acceptable.

The second proposed change to the TS is to reference acoustic monitors as the primary means of determining if the tested relief valve has opened. This change was proposed in order to achieve consistency and clarity throughout the TS. This change: (1) adds a reference to acoustic monitors to the existing TS 4.1.5.a as the primary means to indicate that each relief valve has opened and (2) describes the new TS 4.1.5.a in its entirety in TS 4.2.9 instead of referring to TS 4.1.5.a. Providing the old TS 4.1.5.a in new TS 4.2.9 instead of referring to it is acceptable because this merely rearranges the TS.

In the existing TS, there is an inconsistency between TS 4.1.5.a, 4.2.9.a and TS Table 4.6.11. Table 4.6.11, Accident Monitoring Instrumentation, lists the primary relief valve position indicator as the acoustic monitors and the backup indicator as the thermocouples. The existing TS 4.1.5.a and 4.2.9.a lists only the thermocouples as the means to indicate the relief valve is open. Adding the acoustic monitors to the new TS 4.1.5.a and 4.2.9.b will change these TS to be consistent with TS Table 4.6.11. Therefore, these changes are acceptable.

The third change would remove the word "low" in existing TS 4.1.5.a as it references reactor pressure for testing of the Automatic Depressurization System (ADS) relief valves. This applies to both TS 4.1.5 and 4.2.9 because the licensee proposed to add the test of TS 4.1.5.a to TS 4.2.9 instead of stating "see 4.1.5.a" in the existing TS 4.2.9. The definition associated with the term "low" is ambiguous, therefore, the licensee proposed to delete

"low" in existing TS 4.1.5.a since the tests are performed at operating pressures in excess of 950 psig. As discussed in Section 3.1, the test of the relief valves should not be conducted at low reactor pressure. Therefore, this change is acceptable.

Based on the above, the licensee's proposed changes to TS 4.1.5 and 4.2.9 are acceptable.

4.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes to the surveillance requirements. The staff has determined that the amendment involves 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this 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 nor environmental assessment need be prepared in connection with the issuance of this amendment.

5.0 CONCLUSION

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 this amendment will not be inimical to the common defense and security nor to the health and safety of the public.

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