SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO GENERIC LETTER 83-28, ITEMS 3.1.1, 3.1.2, 3.2.1, 3.2.2 and 4.5.1

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR POWER STATION, UNIT 1

DOCKET NO. 50-220

1.0 Introduction

On February 25, 1983, both of the scram circuit breakers at Unit 1 of the Salem Nuclear Power Plant failed to open upon an automatic reactor trip signal from the reactor protection system. This incident occurred during the plant startup, and the reactor was tripped manually by the operator about 30 seconds after the initiation of the automatic trip signal. The failure of the circuit breakers has been determined to be related to the sticking of the undervoltage trip attachment. Prior to this incident, on February 22, 1983, at Unit 1 of the Salem Nuclear Power Plant, an automatic trip signal was generated based on steam generator low-low level during plant startup. In this case, the reactor was tripped manually by the operator almost coincidentally with the automatic trip.

Following these incidents, on February 28, 1983, the NRC Executive Director for Operations (EDO), directed the staff to investigate and report on the generic implications of these occurrences at Unit 1 of the Salem Nuclear Power Plant. The results of the staff's inquiry into the generic implications of the Salem unit incidents are reported in NUREG-1000, "Generic Implications of ATWS Events at the Salem Nuclear Power Plant." As a result of this investigation, the Director, Division of Licensing, Office of Nuclear Reactor Regulation requested (by Generic Letter 83-28 dated July 8, 1983) all licensees of operating reactors, applicants for an operating license, and holders of construction permits to respond to certain generic concerns. These concerns are categorized into four areas: (1) Post-Trip Review, (2) Equipment Classification and Vendor Interface, (3) Post-Maintenance Testing, and (4) Reactor Trip System (RTS) Reliability Improvements. Within each of these areas various specific actions were delineated.

This safety evaluation (SE) addresses the following actions of Generic Letter 83-28:

-- 3.1.1 and 3.1.2, Post Maintenance Testing (Reactor Trip System Components)

-- 3.2.1 and 3.2.2, Post Maintenance Testing (All Other Safety-Related Components)

-- 4.1, Reactor Trip System Reliability (Vendor-Related Modifications)

-- 4.5.1, Reactor Trip System Reliability (System Functional Testing)

By letters dated November 8, 1983, February 29, 1984, April 30, 1984, July 31, 1984, September 4, 1984, November 30, 1984, December 28, 1984, December 31, 1984, January 30, 1985, July 2, 1985 and December 31, 1985, Niagara Mohawk Power Corporation (NMPC or the licensee) described their planned or completed actions regarding the above items for Nine Mile Point Nuclear Power Station, Unit 1 (NMP-1). Item 4.1 applies to Pressurized Water Reactors (PWR) only and therefore is not applicable to NMP-1 and no action is required.

2.0 Evaluation

2.1 General

Generic Letter 83-28 included various NRC staff positions regarding the specific actions to be taken by operating reactor licensees and operating license applicants. The Generic Letter 83-28 positions and discussions of licensee compliance regarding Actions 3.1.1, 3.1.2, 3.2.1, 3.2.2, and 4.5.1 for NMP-1 are presented in the sections that follow.

2.2 Actions 3.1.1 and 3.1.2, Post-Maintenance Testing (Reactor Trip Systems Components)

Position

Licensees and applicants shall submit the results of their review of test and maintenance procedures and Technical Specifications to assure that post-maintenance operability testing of safety-related components in the reactor trip system (RTS) is required to be conducted and that the testing demonstrates that the equipment is capable of performing its safety functions before being returned to service.

Licensees and applicants shall submit the results of their check of vendor and engineering recommendations (regarding safety-related components in the RTS) to ensure that any appropriate test guidance is included in the test and maintenance procedures or the Technical Specifications, where required.

Discussion

By letter dated December 31, 1985, the licensee indicated that he has reviewed Instrumentation & Control Department procedures and Technical Specifications to assure that post-maintenance operability testing of safety-related components in the reactor trip system is

required to be conducted. In the same letter, the licensee also indicated that the review of the maintenance procedure is not completed. However, the licensee has committed to complete the review and revision of the maintenance procedures by November 1986. Based on the licensee's commitment, the staff finds this acceptable. The licensee also indicated that vendor recommended test guidance has been reviewed, evaluated, and, where appropriate, included in the test and maintenance procedures or the Technical Specifications. The licensee's post-maintenance testing will verify component capability to perform all safety functions.

Based on the above including the licensee's commitment to complete the review and revision to maintenance procedures by November 1986, the licensee complies with the NRC staff position for actions 3.1.1 and 3.1.2 of Generic Letter 83-28.

2.3 Actions 3.2.1 and 3.2.2, Post-Maintenance Testing (All Other Safety Related Components)

Position

Licensees and applicants shall submit a report documenting the extending of test and maintenance procedures and Technical Specifications review to assure that post-maintenance operability testing of all safety-related equipment is required to be conducted and that the testing demonstrates that the equipment is capable of performing its safety functions before being returned to service.

Licensees and applicants shall submit the results of their check of vendor and engineering recommendations (all other safety-related components) to ensure that any appropriate test guidance is included in the test and maintenance procedures or the Technical Specifications, where required.

Discussion

By letter dated December 31, 1985, the licensee has indicated that he had reviewed Instrumentation & Control Department procedures and Technical Specifications to assure that post-maintenance operability testing of all safety-related components is required to be conducted. In the same letter, the licensee also indicated that the review of the maintenance procedures is not complete. However, the licensee committed to complete the review and revision of the maintenance procedures by November 1986. The licensee also indicated that vendor recommended test guidance has been reviewed, evaluated, and where appropriate included in the test and maintenance procedures or the Technical Specifications. The licensee's post-maintenance testing will verify component capability to perform all safety functions.

Based on the above including the licensee's commitment to complete the review and revision to maintenance procedures by November 1986, the licensee complies with the NRC staff position for actions 3.2.1 and 3.2.2 of Generic Letter 83-28.

2.4 Action 4.5.1, Reactor Trip System Reliability (System Functional Testing)

Position

On-line functional testing of the reactor trip system, including independent testing of the diverse trip features, shall be performed on all plants. The diverse trip features to be tested include the breaker undervoltage and shunt trip features on Westinghouse, B&W and CE plants; the circuitry used for power interruption with the silicon controlled rectifiers on B&W plants; and the scram pilot valve and backup scram valves (including all initiating circuitry) on GE plants.

Discussion

The NMP-1 reactor trip system includes motor-generator power supplies, sensors, relays, bypass circuitry, scram pilot valves and backup scram pilot valves that cause rapid insertion of control rods (scram) to shut down the reactor. By letters dated July 31, 1984 and December 31, 1984, the licensee indicated that the on-line functional testing of the reactor trip system, including independent testing of the diverse trip features, the scram pilot valves, and all initiating circuitry are performed in accordance with the NMP-1 Technical Specifications except that the backup scram valves will be tested during the refueling outages.

In the letter dated December 31, 1984, the licensee stated that the on-line functional testing of the backup scram valves is unwarranted. However, the licensee committed to perform a qualitative test of the backup scram valves during each refueling outage. NMP-1 has two redundant backup scram valves which assure that the control rods do actuate, should any of the pilot scram valves fail to function. Functional testing of the backup scram valves during plant operation would require a plant scram, a significant challenge to plant safety systems and, therefore, a degradation of plant safety. The backup scram valves are non-safety-related additions employed to enhance the reliability of the safety-related reactor trip system. A memorandum dated November 16, 1984, from R. W. Houston, Assistant Director for Reactor Safety, Division of System Integration, provided justification for not requiring modification to the backup scram valves to provide on-line testability.

Based on the above, the staff concludes that the licensee has complied with the NRC staff position for Action 4.5.1 of Generic Letter 83-28.

3.0 Conclusion

Based upon the foregoing discussions, the staff concludes that the licensee has complied with Actions 3.1.1, 3.1.2, 3.2.1, 3.2.2, and 4.5.1 of Generic Letter 83-28.

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