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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 183 TO FACILITY OPERATING LICENSE NO. DPR-59

POWER AUTHORITY OF THE STATE OF NEW YORK

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

DOCKET NO. 50-333

1.0 INTRODUCTION

By letter dated June 22, 1992 (JPN-92-030), the Power Authority of the State of New York (PASNY, the licensee) submitted a request for changes to the James A. FitzPatrick Nuclear Power Plant Technical Specifications (TS). The requested changes would add and clarify response time testing requirements for the reactor protection system (RPS) and main steam isolation valve (MSIV) actuation instrumentation including the analog transmitter trip system (ATTS). The proposed changes would add response time testing (RTT) requirements for the instrument channels for 11 trip functions to the definitions, limiting conditions for operation, and surveillance requirements sections. Existing RPS relay logic response time testing requirements would be eliminated for those trip functions which are not included in the RTT requirements of NUREG-0123 Revision 3, the Standard Technical Specifications (STS), and for which response time is not considered in the accident and transient analyses described in the Final Safety Analysis Report (FSAR). In order to be consistent with the STS, RTT requirements would be limited to those trip functions for which the instrument channel response time is significant (when compared to the total system response time) and for which credit for response time is taken in the transient and accident analyses described in the FSAR. The response time limits would be increased from the previous 50 millisecond (ms) limit to accommodate the response time of the additional sensors, ATTS components, and other components installed in the instrument channels by modification (MOD-F1-82-053), and those components which were already existing in instrument channels and which will now, by the new definitions, be included in response time testing. The frequency of individual channel response time testing would be decreased from the existing requirements to reduce personnel radiation exposure during testing and to be consistent with the STS.

2.0 BACKGROUND

The ATTS was developed by General Electric Company (GE) to offset operating disadvantages regarding testing and setpoint drift associated with the mechanical sensor (differential pressure) switches. GE provided a description of the ATTS design in Licensing Topical Report NEDO-21617-A, "Analog Transmitter/Trip Unit System for Engineered Safeguard Sensor Trip Inputs," dated December 1978. The NRC staff reviewed this report on a generic basis

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and concluded that the ATTS design was acceptable (Reference letter dated June 27, 1978 from O. Parr, NRC to G. Sherwood, GE). However, the staff identified plant-specific design information to be submitted by the licensees implementing the ATTS design. This information pertained to interfaces between the ATTS and other systems, environmental qualification of ATTS components, and divisional separation of redundant ATTS hardware to be installed in the plant.

By letter dated March 21, 1985, as supplemented March 28, 1985, the licensee proposed changes to the FitzPatrick TS associated with the installation of ATTS components used to initiate a reactor trip and actuate engineered safety feature systems. The licensee stated that installation of the ATTS, was in accordance with GE's Licensing Topical Report NEDO-21617-A. Because of previous staff review efforts which documented the overall acceptability of the GE ATTS design, the review of the ATTS modifications at FitzPatrick was limited to plant specific aspects of the ATTS installation, and the associated TS changes requested by the licensee. The NRC issued Amendment 89 on May 7, 1985. The amendment changed the surveillance and calibration requirements to accommodate the ATTS. However, the amendment did not change requirements for response time testing to reflect the methods described in the licensing topical report nor the Standard Technical Specifications.

Response time testing for instrument loops using mechanical sensors began at the output contacts of the sensors. With the installation of ATTS, the comparable contacts are located at the output of the ATTS relays rather than the output of the sensors. Since the installation of the ATTS in 1985, response time testing has been conducted beginning from the output of the ATTS relays. Accordingly, the measured response time did not include the response time of the ATTS components (sensor, trip unit, relay) as described in the GE ATTS licensing topical report, NEDO-21617-A.

Following the identification of this error in 1992, the licensee (DCM-11), and GE (DRG-A00-03658-1) evaluated the entire scope of response time testing requirements for both ATTS and other instrument channels, based on the transient and accident analyses described in the Final Safety Analysis Report. These evaluations identified the specific instrument channels for which there is a basis to require response time testing. Accordingly, the licensee prepared an application for an amendment to the Technical Specifications to incorporate appropriate response time testing requirements.

3.0 EVALUATION

The licensee has performed an evaluation (DCM-11) identifying those reactor protection system and primary containment isolation system (PCIS) trip functions for which the instrument channel response time is considered in the transient and accident analyses described in the FSAR. The licensee concluded that the results of the transient and accident analyses described in the FSAR

are potentially sensitive to response time for eight RPS trip functions. These RPS trip functions are:

1. Reactor Vessel Pressure - High
2. Drywell Pressure - High
3. Reactor Water Level-Low (L3)
4. Main Steam Isolation Valve Closure
5. Turbine Stop Valve Closure
6. Turbine Control Valve Fast Closure
7. APRM Fixed (120%) High Neutron Flux
8. APRM Flow Referenced Simulated Thermal Power

These eight RPS trip functions and their associated response times are listed in the proposed TS Table 3.1-2, "Reactor Protection System Instrumentation Response Times." The licensee concluded that with the exception of the main steam isolation valves (MSIVs), response time testing is not required for any of the isolation systems and associated isolation actuation instrumentation. The position was supported by analyses which examine the basis for primary containment isolation response time with respect to the loss of coolant accident (LOCA), and high energy line break (HELB). Therefore, the licensee concluded that the results of the transient and accident analyses described in the FSAR are potentially sensitive to response time for three PCIS trip functions. These PCIS trip functions are:

1. MSIV Closure - Reactor Low Water Level (L1)
2. MSIV Closure - Low Steam Line Pressure
3. MSIV Closure - High Steam Line Flow

These three PCIS trip functions and their associated response times are listed in the proposed TS Table 3.2-9, "Primary Containment Isolation System Actuation Instrument Response Times."

The licensee also performed an evaluation of Emergency Core Cooling Systems (ECCS) (i.e., Core Spray, Low Pressure Coolant Injection, High Pressure Coolant Injection, Automatic Depressurization, and Reactor Core Isolation Cooling) to determine whether the accident and transient analyses were sensitive to individual instrument response times for these systems. The licensee concluded that measurement of individual instrument response times for the ECCS is not required because the ECCS initiation sensors do not represent a significant portion of the particular system overall response time.

As outlined above, the proposed TS will require response time testing for those RPS and PCIS trip functions for which the instrument channel response time is significant to the transient and accident analyses described in the FSAR. This response time testing will include all components in the channel, beginning with the sensor and including the ATTS components and RPS logic relays, through and including opening of the contactors which de-energize the scram pilot valve solenoids, or the MSIV actuation solenoids as applicable.

Accordingly, for the RPS, the proposed response times will be increased to include the original 50 ms for the RPS logic relays and an additional time interval for the sensor, ATTS, and stated other components in the channel. The response time of the neutron monitoring sensors will not be included in channel response time measurements because they are excluded by NRC Regulatory Guide 1.118, Revision 2 dated June 1978. The licensee has also proposed to change the channel testing frequency. The current TS require that all channels of each trip function be tested on an 18-month interval. The proposed TS will require that one channel of each trip function be tested in each trip system during an 18-month interval and that all channels of each trip function be tested within two test intervals. This change in channel testing frequency is based on STS surveillance requirements.

The NRC staff has reviewed the Technical Specification changes proposed by the licensee to support new response time testing requirements for the RPS and PCIS trip functions. Based on our review of the documentation submitted by the licensee, we conclude that the licensee's application of response time testing requirements only to those instrument channels for which response time is significant to the FSAR transient and accident analyses is consistent with the Standard Technical Specifications and is acceptable. Furthermore, increasing the number of channel components that are subject to response time testing is appropriate and should provide increased assurance of proper system performance and safety.

The NRC staff review of the proposed response times for both the RPS and PCIS actuation instrumentation indicates that these response times are either more conservative or the same as those outlined in the STS except for the MSIV closure on high steam line flow. The STS value for high steam line flow instrumentation response time for MSIV actuation is $\leq$ 0.5 second whereas the proposed TS change calls for a $\leq$ 2.5 second response time. GE analysis of MSIV closure instrumentation response time indicated that this increase in the instrument response time was caused by the electronic filter that was installed to eliminate spurious high flow trips. The GE analysis determined that the FSAR evaluation of a main steam line break is based on a 0.5 second instrument response time and a conservative 10 second MSIV closing time; whereas, the FitzPatrick FSAR (Table 7.3-1) allows a maximum of 5 seconds for closing of a MSIV. The GE analysis of the main steam line break (assuming 2.5 second response time and 5.0 second MSIV closure time) found that the FSAR evaluation remains bounding, and that a 2.5 second flow instrument response time does not degrade plant safety. Based on our review of the documentation submitted by the licensee, we conclude that proposed response times, including that for MSIV closure on high steam flow, are acceptable.

The NRC staff has reviewed the licensee's proposed TS changes that result in a reduction in channel testing frequency. Specifically, the current TS require that all channels of each trip function be tested on an 18-month interval. The proposed change will require that one channel of each trip function be tested in each trip system during an 18-month interval and that all channels of each trip function be tested within two test intervals. The NRC staff

concludes that the proposed testing frequency is consistent with the STS (4.3.1.3), and is adequate to appropriately monitor system performance. Therefore, the staff finds the proposed channel testing frequency requirements acceptable.

In addition to the above stated changes to the TS, the licensee has added associated definitions, revised affected Limiting Conditions for Operation and Bases, and made several administrative changes. Our review found these changes appropriate and acceptable.

Based on the above evaluation, the NRC staff concludes that the TS changes proposed by the licensee in its amendment application dated June 22, 1992 are acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New York 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 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 the amendment involves no significant hazards consideration, and there has been no public comment on such finding (57 FR 30256). 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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