

July 24, 1985

Docket No. 50-333

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Mr. John C. Brons
Senior Vice President -
Nuclear Generation
Power Authority of the State
of New York
123 Main Street
White Plains, New York 10601

Dear Mr. Brons:

SUBJECT: TMI ITEM II.K.3.28

Re: James A. FitzPatrick Nuclear Power Plant

We have completed our review of your submittals dated January 18, 1980, April 1, 1982, February 17, June 8, and September 4, 1984, and April 1, 1985 regarding TMI Item II.K.3.28, Qualification of Automatic Depressurization System (ADS) Accumulators. Based on this review, we conclude that the requirements of Item II.K.3.28 have been satisfactorily addressed and that qualification of ADS accumulators at FitzPatrick has been verified.

A copy of our Safety Evaluation supporting this conclusion, is enclosed.

Sincerely,

Original signed by/

Domenic B. Vassallo, Chief
Operating Reactors Branch #2
Division of Licensing

Enclosure:
As stated

cc w/enclosure:
See next page

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James A. FitzPatrick Nuclear
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

TMI ACTION PLAN II.K.3.28 VERIFY QUALIFICATION

OF ACCUMULATORS ON ADS VALVES

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

DOCKET NO. 50-333

1.0 Background

Safety analysis reports claim that air or nitrogen accumulators for the automatic depressurization system (ADS) valves are provided with sufficient capacity to cycle the valves open five times at design pressures. GE has also stated that the emergency core cooling (ECC) systems are designed to withstand a hostile environment and still perform their function for 100 days following an accident. Licensees and applicants must demonstrate that the ADS valves, accumulators, and associated equipment and instrumentation meet the requirements specified in the plant's FSAR and are capable of performing their functions during and following exposure to hostile environments, taking no credit for non-safety-related equipment or instrumentation. Additionally, air (or nitrogen) leakage through valves must be accounted for in order to assure that enough inventory of compressed air is available to cycle the ADS valves. If this cannot be demonstrated, it must be shown that the accumulator design is still acceptable.

The commitment to satisfy the requirement of II.K.3.28 for the FitzPatrick Nuclear Power Plant is discussed in the licensee's submittals dated January 18, 1980, April 1, 1982, and their responses to the requests for additional information dated February 17, 1984 (which repeats all of the information contained in the earlier letters), June 8, 1984, September 4, 1984, and April 1, 1985.

2.0 Discussion

There are seven relief valves in the FitzPatrick ADS, each with its own accumulator and check valve. The accumulators are approximately one gallon in volume, and the check valves are redundant (i.e., two (2) in series). The previously existing soft-seated check valves did not have documentation attesting to their seismic and environmental qualification and have been recently replaced with qualified valves. The accumulators are normally supplied from the Containment Atmosphere Dilution System (N2), which is safety grade. A back-up supply of air is available (through valving) from the instrument air system. The ADS at FitzPatrick was originally designed to provide two actuations at 70% of drywell design pressure within a short time (hours) after loss of pneumatic supply.

3.0 Demonstration of Qualification

3.1 Number of Actuations

The licensee has determined the number of actuations that the accumulators will provide at normal and at 70% of drywell pressure, and has also defined the time period for which this capability exists depending on the starting pressure and assumed leakage rate. For a starting pressure of 110 psig (normal system pressure), the accumulators will provide two actuations at 70% of drywell pressure within 200 minutes (approx. 3-1/3 hours). For normal drywell pressure, this time period is increased to 260 minutes (approx. 4-1/3 hours).

3.2 Leakage Criteria

The licensee's letter of February 17, 1984 cites a leakage criteria of 0.12 SCFH past the check valves which will insure the capability outlined in Section 3.1 above. The leakage test described (pressure decay) actually includes leakage from all components of the ADS from the check valve to the relief valves. Seismic events and harsh environments should not cause an increase in leakage rate according to the licensee, since a seismic review has shown the electrical components have been qualified under the ongoing environmental qualification program.

3.3 Periodic Leak Testing

The licensee has established a specific interval for the periodic leak tests (before startup after each refueling outage), and has accomplished a number of tests on the ADS with the presently installed check valves. The tests consist of a pressure decay after temperature stabilization, with pressure measured at the relief valve actuator.

3.4 Seismic and Environmental Qualification

The licensee's letter of January 8, 1980 stated that a review of the FitzPatrick ADS has indicated that the ADS would withstand a seismic event without damage. The licensee's architect and engineers (A & E), also analyzed two of the seven systems and the results indicate that the stresses due to a seismic event are below 1/10 of the maximum allowed stress. The electrical components of the ADS accumulator system (relief valve pilot solenoid valves) have been qualified for a harsh environment as part of the licensee's environmental qualification program. System check valves were replaced with qualified valves during the 1985 refueling outage.

4.0 Evaluation

4.1

The licensee has defined and verified the number of times the ADS valves are capable of cycling using only the accumulators, and the length of time the accumulators are capable of performing their functions following the

loss of pneumatic supply. The staff finds this capability acceptable for the indicated time period only (up to 4-1/3 hours). The licensee has committed to upgrade the ADS accumulator system to remain functional for periods up to 100 days following an accident during the 1986 refueling outage. This will be accomplished either by providing an environmentally and seismically qualified back-up system to recharge the accumulators for long term operation or by providing redundant safety-related pneumatic sources to actuate the ADS valves. The staff finds this acceptable.

4.2

A basis for the allowable leakage criteria was provided. Maximum allowable leakage past the check valves is less than or equal to 0.12 SCFH. Although, it would be more conservative to assume an increased leakage rate after a seismic event or an accident, the licensee has examined the effects of these events on the leakage rate and concluded that there will be no increase. The staff finds this acceptable.

4.3

The licensee has conducted leak tests on the ADS system. From the description of the tests (pressure decay method) in the licensee's letter of February 17, 1984, the staff finds the method used to be acceptable. The air lines are configured as a ring-header within the drywell. The line supplying the ring-header is equipped with a low/high pressure alarm which indicates in the control room. A loss of accumulator pressure is also annunciated in the control room. The licensee has established the specific test interval to be before startup after each refueling outage.

4.4

The licensee has provided statements acceptable to the staff confirming the following:

- a. That the ADS valves, accumulators, and piping out to and including the check valves are seismically and environmentally qualified.
- b. That the accumulators and associated equipment are capable of performing their functions during and following an accident while taking no credit for non-safety related equipment and instrumentation.

5.0 Conclusions

Based on the evaluations given in Sections 4.1, 4.2, 4.3, and 4.4, the staff concludes that the licensee has verified the qualification of the ADS accumulator systems at the FitzPatrick Nuclear Power Plant.

Principal Contributor: J. Lombardo

Dated: July 24, 1985