



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

SAFETY EVALUATION REPORT SUPPLEMENT
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO THE PUMP AND VALVE
INSERVICE TESTING PROGRAM
THREE MILE ISLAND NUCLEAR STATION, UNIT 1
DOCKET NO.: 50-289

INTRODUCTION

10 CFR 50.55a(g) requires that each water-cooled nuclear reactor facility have an inservice testing (IST) program for pumps and valves to meet the requirements of the applicable edition of Section XI of the ASME Boiler and Pressure Vessel Code.

The IST program for Three Mile Island, Unit 1 was submitted to the NRC and was reviewed by the staff. The results of the staff review were provided to the licensee in a Safety Evaluation Report (SER) dated March 19, 1987. That SER contained open items to be resolved. One of the items required GPU Nuclear (GPUN), the licensee, to justify that failure of either valve EG-V17A or B (Emergency Diesel Air Start System) would not cause degradation of diesel generator performance and the valves need not be included in the IST program. The GPUN justification was provided in a letter from GPUN to NRC dated September 17, 1987.

In addition, by letter dated November 3, 1987, GPUN provided information addressing the frequency of disassembling check valves BS-V30A/B, BS-V52A/B, DH-V14A/B and MS-V9A/B for inspection purposes in accordance with the relief granted in the March 19, 1987 SER.

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This SER supplement provides the staff evaluation of the information submitted in the above two letters. The evaluation addresses the two items separately.

EVALUATION

1. Valves EG-V17A/B

GPUN in its letter of September 17, 1987, provides the following information: "EG-V17A/B are three-way, 1/4" solenoid operated vent valves with a 3/16" orifice. This valve closes when starting air is admitted to the emergency diesel generator. Failure of the valve to close would not prevent the diesel from starting because the supplied air capacity available during the starting sequence exceeds the sum of that which would be lost through the small orifice plus the minimum necessary to start the diesel. The result would be more frequent air compressor cycles after diesel starts in order to replenish the air start receivers.

As the diesel starts, at approximately 250 rpm (increasing) EG-V17 opens. The purpose is to vent the pressure remaining between the diesel air start solenoid valves (EG-V16s) and the engine. The failure of EG-V17 to open and vent does not impair the starting ability of the diesel or lead to any failure because venting would occur through the 12 diesel cylinder head check valves. The diesel cylinder head check valves open to allow starting air to enter each of the 12 cylinders.

Therefore, GPUN concludes that EG-V17A/B are not essential for the starting or operation of the diesels but are provided only to assure a more positive and somewhat more rapid venting of the piping between the air start solenoid valves and the engine in order to prevent long term diesel head cylinder check valve seat burning and long wear to the air start distributor. The annual diesel inspection conducted in accordance with GPUN procedure SP 1301-8.2 would result in the identification and correction of any problems that might occur.

The vendor, Fairbanks-Morse Engine Division of Colt Industries, by letter dated August 24, 1987 also concurs that failure of EG-V17A/B would have no effect on the starting or operation of the emergency diesel generators and that the annual inspection and overhaul is adequate to identify and resolve potential seat burning problems of the diesel cylinder head check valves or abnormal/excessive wear of the air start distributor."

The licensee concludes that valves EG-V17AB are not needed to mitigate an accident and are not needed to shutdown the plant and, because they have no safety function, will not be added to the IST program.

Based on the information provided above, the staff concurs that EG-V17A/B do not perform a safety function and need not be included in the IST program.

2. Valves BS-V30A/B
 -- BS-V52A/B
 DH-V14A/B
 MS-V9A/B

The SER dated March 19, 1987 granted relief from the ASME Code specified quarterly full-stroke exercise frequency for these valves. That SER requires that the full stroke capability of these valves be demonstrated by sample disassembly on a refueling outage frequency.

In its letter dated November 3, 1987, GPUN restates its position that disassembling valves on a sampling basis (alternating between the A and B valve for each valve set) each refueling results in excessive wear and tear on the parts for very little information. The licensee also provided a summary of the disassembly and inspection results for the eight valves and provided arguments for less frequent disassembly and inspections. GPUN concludes that an adequate technical basis has been provided to extend the disassembly and inspection to a 10 year frequency.

The staff has reviewed the information and does not concur with the licensee's conclusions.

Section XI of the ASME code requires that check valves be exercised at least once every 3 months. The licensee has requested relief from the code specified

frequency for these valves and demonstrated that the code specified exercise frequency is impractical. The relief requested was granted on a refueling outage frequency in the SER dated March 19, 1987.

The NRC staff has concluded that a valve sample disassembly/inspection utilizing a manual full-stroke of the disk is an acceptable method to verify a check valve's full-stroke capability. The sampling technique requires that each valve in the group must be of the same design (manufacturer, size, model number and materials of construction) and must have the same service conditions. Additionally, at each disassembly it must be verified that the disassembled valve is capable of full-stroking and that its internals are structurally sound (no loose or corroded parts).

A different valve of each group is required to be disassembled, inspected and manually full-stroked at each refueling, until the entire group has been tested. If it is found that the disassembled valve's full-stroke capability is in question, the remainder of the valves in that group must also be disassembled, inspected, and manually full-stroked at the same outage.

The information presently available does not provide an adequate basis to allow a 10 year disassembly and inspection frequency. The licensee is required to maintain the refueling outage disassembly and inspection frequency granted for these valves in the SER dated March 19, 1987.

INSPECTION REPORT 87-10-03

Section 3.3.4 of Inspection Report 87-10-03 notes that the check valves located upstream of the diesel generator air start receivers (valve numbers EG-V10 A/B) are not addressed in the licensee's IST program. The function of these valves is to seat and prevent loss of air pressure when the compressor unloads after the recharging cycle.

It is the staff's position that, in preventing loss of air pressure in the diesel air start receiver, these valves perform a safety related function and must be included in the IST program for TMI-1.

CONCLUSIONS

Based on the evaluation provided above, the staff concludes as follows:

1. The diesel air vent valves, EG-V17 A/B, do not perform a safety related function and may be excluded from the IST program.
2. The licensee has not provided an adequate basis to allow a 10 year disassembly and inspection frequency for valves BS-V30 A/B, BS-V52 A/B, DH-V14 A/B and MS-V9 A/B. The refueling outage disassembly and inspection frequency relief granted in the SER dated March 19, 1987 must be maintained.
3. The diesel generator air start receiver check valves, EG-V10 A/B, do perform a safety related function and must be included in the IST program.

The licensee must add these valves to the TMI-1 IST program and exercise the valves in accordance with the requirements of Section XI of the ASME Boiler and Pressure Vessel Code. Appropriate relief requests may be submitted as necessary.

The IST program for TMI-1 must be revised to incorporate the results of this SSER within 90 days of receipt of this SSER.

Dated: March 31, 1988

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