U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-289/84-37

Docket No. 50-289

License No. DPR-50 Priority - Category C

Licensee: GPU Nuclear
P. O. Box 480
Middletown, Pennsylvania 17057

Facility Name: Three Mile Island Nuclear Station, Unit 1

Inspection At: Middletown, Pennsylvania

Inspection Conducted: November 19-21, 1984

Inspectors: D. J. Vito
D. J. Vito, Reactor Engineer — 12/17/84 date

Approved by: L. H. Bettenhausen
L. H. Bettenhausen, Chief,
Test Programs Section — 12/20/84 date

Inspection Summary: Inspection on November 19-21, 1984 (Inspection Report No. 50-289/84-37)

Areas Inspected: Routine, unannounced inspection of the operational surveillance program associated with the Emergency Feedwater System, and followup to previous inspection findings. The inspection involved 22 hours onsite by one region based inspector.

Results: No violations were identified.

DETAILS

1. Persons Contacted

GPU Nuclear

J. Bashista, Mechanical Engineer
*R. Knight, Licensing Engineer

NRC Personnel

R. Conte, Senior Resident Inspector
*F. Young, Resident Inspector

*Denotes those present at exit interview on November 21, 1984.

2. Followup on Previous Inspection Findings

(Closed) Inspector Followup Item (289/84-11-03). This item refers to the need for licensee clarification of some terms and phrases used in the Symptom-Oriented Abnormal Transient (ATOG) Procedures. The inspector reviewed the latest revisions of Abnormal Transient Procedures ATP 1210-5, OTSG Tube Leak/ Rupture, Revision 4, 8/28/84; ATP 1210-6, Small Break LOCA Cooldown, Revision 3, 8/28/84, and ATP 1210-9, HPI Cooling - Recovery from Solid Operations, Revision 4, 8/28/84, for clarification of the isolation criteria for the Core Flood Tanks. In addition to the requirement of adequate subcooling margin and an RCS pressure of greater than 700 psig, the licensee has added a phrase to the procedure step which requires that the operator also assures control of RCS pressure and inventory. The inspector noted that this additional phase provided sufficient clarification and would be helpful in assuring the existence of stable plant conditions prior to isolation of the Core Flood Tanks.

The inspector also reviewed GPU Nuclear Memorandum 3210-84-0308 dated July 19, 1984, from M. J. Ross, Manager, Plant Operations to the TMI-1 licensed operators. The intent of the memorandum was to further define the concept of "Excessive" Primary to Secondary Heat Transfer as it is referred to in the ATOG procedures. Previous interviews with the operators had indicated some confusion in the definition of this term. The memorandum emphasized that excessive primary to secondary heat transfer is characterized by an inability to control the cooldown rate to within the required limits. The handling of this excessive cooldown rate will depend on the rate of cooldown and the rapidness of operator response. The inspector was satisfied with the clarifications provided in the memorandum. The inspector also verified that the memorandum had been sent to the plant training department for inclusion in the operator training program.

Based on these findings, this item is closed.

3. Emergency Feedwater System Operational Surveillance

3.1 Documents Reviewed

- NUREG 0680, Supplement No. 5, TMI-1 Restart, Section 5.4, Emergency Feedwater Pump Surveillance Tests
- Surveillance Procedure SP 1300-3F A/B, Motor Driven Emergency Feedwater Pump Functional Test/Valve Lineup and Operability Test, Revision 17, 7/11/84
- Surveillance Procedure SP 1300-3G A/B, Turbine Driven Emergency Feedwater Pump Functional Test and Valve Operability Test, Revision 15, 1/24/84
- Surveillance Procedure SP 1300-3R, Inservice Testing of Valves During Shutdown and Remote Indication Check, Revision 13, 8/4/84
- Surveillance Procedure SP 1302-6.17, Emergency Feedwater Initiation - Loss of Feedwater, Revision 3, 9/28/84
- Surveillance Procedure SP 1303-11.39, Emergency Feedwater Pump Auto Start, Revision 5, 6/13/83
- Surveillance Procedure SP 1303-11.42, Emergency Feedwater Flow Test from Condensate Storage Tank, Revision 1, 6/29/83
- Surveillance Procedure SP 1303-11.53, Emergency Feedwater Flow, Revision 3, 1/5/84
- Operating Procedure OP 1106-6, Auxiliary Systems Operating Procedures - Emergency Feedwater, Revision 36, 6/8/84
- Letter July 10, 1984, H.D. Hukill to J. F. Stolz, Inservice Testing of Pumps and Valves (IST) Program Submittal
- Letter October 23, 1984, J. F. Stolz to H. D. Hukill, NRC Review of TMI-1 IST Program
- ASME Boiler and Pressure Vessel Code, Section XI, Division I, 1980 Edition and Addenda through Winter, 1980.
- TMI-1 FSAR, Section 10.6, Emergency Feedwater System
- TMI-1 Technical Specifications (various sections)

3.2 Scope of Review

The inspector reviewed the documents listed above to determine the technical adequacy of the Emergency Feedwater System (EFW) surveillance program and compliance of the program with the Technical Specifications and other regulatory requirements. The surveillance procedures were reviewed for clarity and for conformance with the inservice testing requirements of the ASME Code.

3.3 Procedure Review

The Emergency Feedwater System surveillance procedures listed in Section 3.1 were reviewed for technical adequacy and procedural clarity. The review was inclusive of all the pumps and valves associated with the EFW system. As such, the review of the EFW pump surveillance tests fulfills the requirements stated in NUREG-0680, Supplement 5, Section 5.4.2 for NRC review of the EFW pump surveillance procedures prior to TMI-1 restart.

The review of the EFW system surveillance procedures revealed the following:

a. The inspector found no instances of procedural discontinuity; i.e., procedures could be followed logically from beginning to end and valve lineups and procedural valve manipulations occurred in a logical fashion.

b. All valves which require testing were addressed in the procedures. However, EF-V3, the Emergency River Water Suction Source Check Valve was not tested for full stroke capability. Also, MSV-10A and MSV-10B, Steam Supply Valves to the Turbine Driven EFW Pump Turbine, were not stroke time tested. These discrepancies will be addressed later in a discussion of the inservice testing program.

c. The inspector found no instances in the procedures which would effect a simultaneous isolation of both EFW trains. In addition, the procedures contain warnings and reminders to assure the availability of the EFW train which is not being tested, when necessary.

d. Provisions have been made for recording the necessary test instrument readings. These include pressures, differential pressures, vibration readings, and bearing temperatures. The pump surveillance procedures also record the flow rate. However, flow rate is not a test variable as this is a fixed resistance system. Valve stroke times are also recorded, as appropriate.

e. The EFW pump surveillance tests do not indicate any attempts to control both independent and dependent variables simultaneously. This can be more readily verified when the tests are actually performed.

f. Procedure criteria for establishing revised reference values when a reference value or set of values has been affected by the repair or servicing of an EFW pump are acceptable and in accordance with the requirements of Section XI of the ASME Code. The procedures also require that justification for revising a set of reference values shall be documented in the Technical Specification Surveillance file of the affected EFW pump.

Based on these findings the inspector concluded that, with the exception of the IST discrepancies related to valves EF-V3, MSV-10A, and MSV-10B, the EFW system surveillance testing procedures are technically accurate and are in compliance with the applicable testing requirements. The use of these procedures should in no way compromise or degrade the operability of the EFW system.

3.4 EFW System Inservice Testing Requirements

The inspector reviewed the licensee's inservice testing (IST) program as it related to the EFW system in conjunction with the EFW system surveillance procedures to determine if the testing designated in the IST program was indeed being performed as part of the test procedures. The inspector also reviewed the EFW system IST program and surveillance test procedures for conformance with subsections IWP and IWV of Section XI of the ASME code.

With the exception of the valve testing discrepancies noted below, the inspector found the IST program and the surveillance testing procedures for the EFW system to be in conformance with the procedural, measurement, records, and test results evaluation requirements of Subsections IWP and IWV of Section XI of the ASME Code.

The noted discrepancies are:

1. Subsection IWV of Section XI of the ASME Code states that check valves may be part-stroke exercised during plant operation if full-stroke exercising is not practical but shall be full-stroke tested during periods of cold shutdown if it has been longer than 3 months since the last full-stroke functional test. The Emergency River Water Suction Source Check Valve EF-V3 is only partially stroke tested in SP-1300-3G A/B, Turbine Driven EFW Pump Functional Test and Valve Operability Test. This discrepancy was noted in the NRR review of the TMI-1 IST Program. (Letter of 10/23/84, J. F. Stolz to H. D. Hukill). The licensee has been given 120 days from the date of this letter to revise the procedures and the TS to reflect the IWV requirement.

2. The inspector noted that although the IST program states that Turbine Driven EFW Pump Steam Supply Line Valves MSV-10A and MSV-10B will be full-stroke tested and stroke timed, the step calling for stroke timing of these valves could not be located in any of the EFW system surveillance procedures. A licensee Mechanical Engineering Department representative stated that this discrepancy had already been identified and that a procedure change was in process. The process change had not received approval by the completion of this inspection.

The resolution of these items will be reviewed during a future inspection of the licensee's IST program. These items are collectively designated as Inspector Followup Item 50-289/84-37-01.

3.5 EFW System Technical Specification Surveillances

As an independent check of the comprehensiveness of the IST program and related procedures, the inspector reviewed the TMI-1 Technical Specifications to determine whether TS required testing of the EFW system was addressed in plant procedures. The inspector found that all of the testing required by the TS was addressed in the operating procedure and surveillance procedures related to the EFW system. The procedures and related TS are as follows:

Procedure	TS	Subject
OP 1106-6	3.4.1.6 3.5.5.1	EFW Train Availability EFW Flow Accident Monitoring Instrumentation Availability
SP 1303-11.53	Table 4.1-1, Item 50	EFW Flow Instrumentation Calibration
SP 1303-11.42	4.9.1.6	EFW Flow Test from CST to Steam Generators from Motor Driven EFW Pumps
SP 1303-11.39 SP 1302-6.17	Table 4.1-1, Item 51	EFW System Starting Instrumentation Checks
SP 1300-3F A/B SP 1300-3G A/B SP 1300-3R	4.2.2 4.9.1	IST of EFW System Components, System Operability Verification

The inspector concluded that the existing EFW system operating and surveillance procedures are sufficient to perform those actions required by the Technical Specifications, with the exception of the IST program discrepancies noted in Section 3.4 of this report.

4.0 EFW System Operation After Restart

The inspector reviewed the EFW System operating procedure (OP 1106-6) to determine whether or not the licensee commitment to lock open the recirculation line valves during operation had been addressed. This commitment was made in a letter of March 22, 1983 from H. D. Hukill to J. F. Stolz documenting the amount of flow which could be delivered to the steam generators in the event of a rupture in the non-seismically designed portion of the recirculation line. The licensee has stated specifically in OP 1106-6 that the automatic recirculation valves (EFV-8A,B and C) are to be blocked open with mechanical blocks and lifted leads to satisfy the requirement. The controls for EFV-8A,B and C are to be upgraded to Safety Grade during the first refueling outage after restart. The inspector had no further questions at this time.

5.0 QA/QC Involvement

The inspector inquired as to the amount of QA/QC involvement in the EFW system surveillance program. The licensee informed the inspector that although QC monitoring of EFW system surveillance has been planned, involvement at this point in time was minimal. The inspector acknowledged the licensee's statements and stated that a more in-depth review of QA/QC involvement in this area would be performed when the testing is performed.

6.0 Tours

The inspector made several tours of the facility to observe work in progress and general housekeeping. No unacceptable conditions were identified.

7.0 Exit Interview

A meeting was held on November 21, 1984 to discuss the scope and findings of the inspection as detailed in this report. At no time during the inspection was written information provided to the licensee.