

U.S. NUCLEAR REGULATORY COMMISSION

Region I

Report No. 50-289/84-14
Docket No. 50-289
License No. DPR-50 Priority -- Category C
Licensee: GPU Nuclear Corporation
Post Office Box 480
Middletown, Pennsylvania 17057

Facility Name: Three Mile Island Nuclear Station, Unit 1

Inspection At: Middletown, Pennsylvania

Inspection Conducted: May 21 - June 1, 1984

Inspectors: *L. H. Bettenhausen Sr.*
H. Nicholas, Lead Reactor Engineer

7/9/84
date

Peter C. Wen
P. Wen, Reactor Inspector

7-6-84
date

A. Finkel
A. Finkel, Lead Reactor Engineer

June 29/1984
date

Approved By: *L. H. Bettenhausen*
L. H. Bettenhausen, Chief, Test Programs
Section, DETP

7/9/84
date

Inspection Summary: Inspection on May 21 - June 1, 1984 (Inspection Report Number 50-289/84-14)

Areas Inspected: Routine, unannounced inspection by region-based inspectors of licensee action on previous inspection findings; restart preoperational test program including preoperational test procedure review, preoperational test results evaluation and witnessing of hot functional testing; and, restart startup test program including review of test results evaluation. The inspection involved 92 inspection-hours onsite by three region based inspectors.

Results: No violations were identified.

DETAILS

1. Persons Contacted

General Public Utilities (GPU) Nuclear Corporation

R. Knight, Senior Licensing Engineer
T. Hawkins, Manager, Startup and Test TMI-1
J. Pfadenhauer, OQA Supervisor
I. Porter, Assistant Manager, Startup and Test TMI-1
D. Smith, Shift Supervisor TMI-1
C. Smyth, Manager, TMI-1 Licensing
S. Wilkerson, Lead Nuclear Engineer
H. Wilson, Preventive Maintenance Supervisor

U.S. Nuclear Regulatory Commission

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

2. Licensee Action on Previous Inspection Findings

(Closed) 83-LO-32 Instrumentation Support to Design For Thermal Growth

The initial analysis of the instrumentation tubing and supports did not adequately take into account the thermal growth of main piping and its impact on the seismic design.

Inspection of the instrumentation tubing verified that the installed tubing Work Authorization No. A25A-53040 entitled Rework of Rx Building Instrumentation Tubing (Plant Modification) was issued and defined the corrective action to be taken. M&C Work Authorization QA-ADL #20-1 defined the details of the re-work tasks and identified the Quality Assurance requirements to be verified during the instrumentation re-work.

The QA/QC Hold/Witness points assignment form QA-ADL #44-1 and #44-2 was verified by inspection, signed and dated. QC Plant Inspection Report (PIR) No. ES/33455/83 listed and verified the attributes that were verified by the quality control organization.

The inspector reviewed the PORC response data sheets QA-ADL-61-7 and 8. All comments addressed by members of the PORC Board were answered and documented on the Comment Resolution Form.

This item is closed.

3. TMI-1 Restart Preoperational Test Program

References

- Restart Project Organization and Responsibility Document
- TMI-1 Startup and Test Manual
- Recommended Requirements for Restart of TMI Unit 1 (Restart Report) Volumes 1, 2 and 3
- TMI-1 Restart Report, Supplement 2, Operational QA Plan
- TMI-1 Startup and Test Instructions
- NUREG-0680 and Supplements 1, 2 and 3 TMI-1 Restart
- RG 1.68, Initial Test Program for Water Cooled Nuclear Power Plants

3.1 Preoperational Test Procedure Review

Scope

The inspector reviewed the 5 preoperational test procedures listed below for verification, technical and administrative adequacy. The procedures were reviewed for management review and approval, procedure format, test objectives clearly stated, prerequisites, environmental conditions, acceptance criteria, technical references, initial conditions, test performance documentation and verification, detailed instructions for performance of test, recording details of conduct of test, restoration of system to normal after test, documentation of personnel conducting test and evaluating test data, and independent verification of critical steps or parameters.

- (1) Task RM-14, TP 655/1, Revision STR-1, approved May 19, 1984, High Pressure Injection System Functional Test.
- (2) TP 600/5, Revision STR-1, Approved May 18, 1984, RCS Leak Rate Verification Test.
- (3) TP 700/1, Revision STR-1, Approved May 21, 1984, Controlling Procedure for Low Power Physics Testing.
- (4) TP 674/2, Revision 0, Approved May 22, 1984, Reactor Coolant Pump Coastdown and Flow Test.
- (5) TP 366/11, Revision 0, Approved April 18, 1984, Effluent Monitor RM-L12 Modifications Functional Test.

Findings

The inspector determined that the test procedures were adequate for the Hot Functional Testing. No discrepancies were noted during this review and the inspector had no further questions.

3.2 Hot Functional Testing

Discussion

The Hot Functional Testing and retests scheduled for implementation prior to startup, is governed by TP 700/1, Revision STR-1, Approved May 21, 1984, Controlling Procedure for Low Power Physics Testing. The purpose of TP 700/1 is to establish a controlling logic sequence for test and event performance from the initial steam bubble formation in the pressurizer through the plant heatup and ending with pulling rods and proceeding to approximately 5 percent rated power, as well as to record data which is not included in individual Low Power Physics Test procedures. One of the objectives of TP 700/1 is to allow those systems which had problem reports issued concerning their performance during the previous Hot Functional Test (HFT) program to be retested, and to supply pages for recording data on these retests.

Scope

Tests performed during this Hot Functional Test portion of TP 700/1 are listed below.

- (1) Task RM-14 TP 655/1, Revision STR-1, Approved May 19, 1984, High Pressure Injection System Functional Test.
- (2) Task RM-4 TP 846/1, Revision 0, Approved April 29, 1982, Incore Thermocouple Functional Test.
- (3) TP 674/2, Revision 0, Approved May 22, 1984, Reactor Coolant Coastdown Flow Test for RC Pump 1B.
- (4) TP 600/5, Revision STR-1, Approved May 18, 1984, RCS Leak Rate Verification Test.
- (5) Task RM-10 TP 664/1, Revision 0, Approved August 27, 1981, PORV Flow Indication Functional Test.

The inspector witnessed portions of retesting that stemmed from performance concerns arising during earlier portions of the Hot Functional Test Program. These concerns were issued as Problem Reports and retested under the controlling procedure for Low Power Physics Testing, TP 700/1, Revision STR-1, Approved May 21, 1984. The retesting inspection consisted of partially witnessing heatup and pressurization, RC Pump balancing, "B" RC Pump coastdown testing, High Pressure Injection testing, PORV testing, and RCS Leak Rate Testing.

Findings

The required data was recorded for these tests and is to be reviewed, evaluated and approved by the licensee. The region-based and resident inspectors will review the results of these tests and evaluate a sample of the test results when the licensee has concluded his review. The inspector had no further questions at this time.

3.3 Preoperational Test Results Evaluation

Scope

The inspector reviewed 5 completed preoperational test procedures to ascertain whether uniform criteria are being applied for evaluating completed preoperational tests and to assure technical and administrative adequacy by the licensee's review, evaluation and approval of the completed procedures listed below.

- (1) Task RM-13, TP 233/4, Revision 0, Approved January 12, 1984, Emergency Feedwater Test at Low Flow Conditions. Test results approved March 1, 1984.
- (2) Task LM-24B, TP 277/1, Revision 0, Approved December 14, 1982, Post-Accident Reactor Building Atmospheric Sampling System Functional Test. Test results approved March 9, 1984.
- (3) TP 377/2, Revision 0, Approved September 8, 1983, Post-Accident Hydrogen Monitoring Functional Test. Test results approved April 30, 1984.
- (4) TP 377/3, Revision 0, Approved December 14, 1983, Beckman H2/O2 Analyzer Functional Test. Test results approved April 30, 1984.
- (5) TP 600/4, Revision STR-2, Approved July 6, 1983, RCS H2-O2 Cleanup. Test results approved March 28, 1984.

The inspector reviewed the test results and verified licensee evaluation of test results by review of test changes, test exceptions, test deficiencies, "As-Run" copy of test procedure, QA inspection records, and, test results evaluations and approval.

Findings

No discrepancies were noted during review of the above listed test procedures. No open or unresolved test exceptions or deficiencies existed for any of the procedures reviewed. The inspector had no further questions on these items.

4. Restart Startup Test Program

4.1 Rod Drop Test

The rod drop measurement was performed in accordance with procedure SP-1303-11.1, Control Rod Drop Time, Revision 10. The inspector verified this by review of results of the test performed on September 7-23, 1983. The test conditions were at hot (531°F) zero power with all four reactor coolant pumps running. The test results indicated that all control rods reached a 75% insertion in less than 1.66 seconds as required by the Technical Specifications (TS).

Rod position indications were also cross checked among API, RPI and zone reference position. Deviations between zone reference position and API and RPI were all within 5% of each rod.

No items of noncompliance were identified.

4.2 Reactor Coolant Pump Flow Test

NRC Inspection Report No. 50-289/84-11 documented a review of licensee activities regarding Reactor Coolant Pump (RC-P-1B). Following replacement of pump shaft and impeller, the pump was tested during the Hot Functional Test period. The following summarized the test results (RCS temperature at 532°F):

<u>Item</u>	<u>Measured Value</u>	<u>Acceptance Criteria</u>
Total Average RCS Flow (MPPH)	152.07	≥141.8
RC-P-1B Shaft Vibrations (mils)	Horizontal - 5.5 Vertical - 6.0	≤30 ≤20
RC-P-1B Upper Stand Vibration	0.5~0.8	≤2
RC-P-1B Flow Coastdown Characteristics	Coastdown data fall above acceptance curve	Acceptance curve.

The inspector verified that the RCS flow acceptance criteria were consistent with the values used in the safety analysis.

No unacceptable conditions were identified.

4.3 Quality Assurance Audits

QA has an independent sample audit program which includes test witness and test verification for restart startup test program. The inspector reviewed QA monitoring reports WLS-893-84 (R.C. Coastdown Test for RC-P-1B) and MPK-899-84 (HPIS Functional Test) which were performed during the hot functional test period. The inspector noted that QA was actively involved in these activities.

No unacceptable conditions were identified.

5. Exit Interviews

Meetings were held with licensee representatives periodically during the course of the inspection period to discuss inspection scope and findings. Because this inspection included several separate inspection areas, individual inspectors conducted their entrance and exit interviews during the inspection period. A final exit was conducted on June 1, 1984. Because of the separate exit meetings, attendees are not identified in Paragraph 1 of this report. At no time during this inspection was written material provided to the licensee by the inspectors.