

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-289/88-22

Docket No. 50-289

License No. DPR-50

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

Facility Name: Three Mile Island Nuclear Generating Station - Unit 1

Inspection At: Middletown, Pennsylvania

Inspection Conducted: August 22-26, 1988

Inspectors: *H. F. van Kessel* 9-29-88
H. F. van Kessel, Reactor Engineer date

Approved by: *P. K. Eapen* 9/29/88
Dr. P. K. Eapen, Chief, Special Test Programs Section, EB, DRS date

Inspection Summary: Routine Unannounced Inspection on August 22-26, 1988 (Inspection Number 50-289/88-22)

Areas Inspected: Post Modification Test Program, performed during the recent refueling outage, including the review of the post modification test procedures and the review of the available test results for completed post modification tests. The inspector also reviewed the involvement of QA in the post modification test program.

Results: No violations were identified. Three Unresolved Items were identified dealing with the absence of a test personnel signature verification sheet in the test procedures, incomplete QA/QC witness sign-off sheets, and test changes unreviewed by the Test Approval Group (TAG).

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DETAILS

1.0 Persons Contacted

GPU Nuclear Corporation

- *W. Behrle, Director, Startup & Test
- S. Denkelberger, Shift Technical Advisor
- *T. M. Hawkins, Manager, Startup & Test
- J. Herman, QA Auditor
- *C. Incorvati, Audit Manager
- H. M. Mitchell, Startup & Test Engineer
- *S. Otto, Licensing Engineer
- D. Shovlin, Plant Material Director
- D. Smith, Shift Supervisor

U.S. Nuclear Regulatory Commission

- R. Conte, Senior Resident Inspector
- *D. Johnson, Resident Inspector

*Denotes those present at exit meeting held on August 26, 1988

2.0 Post Modification Test Program (72701)

After a review of the scope of work for all of the modification packages, the inspector selected the packages as listed in Attachment A for further review with respect to post modification testing.

In the review of the modification documentation, the technical specification and the existence of the safety evaluation were verified to be in accordance with 10 CFR 50.59(b).

With help from startup management, the required post modification testing done for each selected modification package was established. The MTX number and the test procedure numbers for each selected package are listed in Attachment B.

There are 3 different types of procedures involved, i.e.,

- (1) functional test procedures (system specific)
- (2) supplemental test procedures (system/component specific)
- (3) generic test procedures (components) as follows:
 - TP-200/1, "General Procedure for Leak Testing of Systems and Components"
 - TP-200/0, "Generic Startup Testing of Mechanical Equipment"

- TP-300/0, "Startup and Test Generic Instrumentation Procedure"
- TP-400/0, "Preoperational Startup Testing of Electrical Equipment"

2.1 Post Modification Test Procedure Review

All of the functional and supplemental test procedures were reviewed for the following attributes:

- Management review and approval
- Procedure format
- Clarity of stated objectives
- Prerequisites
- Environmental conditions
- Acceptance criteria and their sources
- References
- Initial conditions
- Attainment of test objectives
- Test performance documentation and verification
- Degree of detail for test instructions
- Restoration of system to normal after testing
- Identification of test personnel
- Evaluation of test data
- Independent verification of critical steps or parameters
- Quality control and assurance involvement

It was noted that none of the test procedures contained a signature/initial verification sheet to identify the signatures and initials of test and QA personnel involved in the completion of the test procedures.

A review of the pertinent administrative procedures grading the preparation of test procedures (5000-ADM7335.01; -4; SP-002) revealed that there is no requirement for such a signature verification sheet. The licensee has agreed to incorporate this requirement in their administrative procedures. The action will be tracked under Unresolved Item 50-289/88-22-01.

The following additional observations were made:

- (1) Temporary changes and their restoration were verified independently.
- (2) Procedures are approved by the Startup and Test Manager and not by the chairman of the Test Approval Group.

2.2 Post Modification Test Results Review

The test results for the procedures listed in Attachment B were reviewed for the following attributes:

- Test Changes
- Test Exceptions
- Test Deficiencies
- Acceptance Criteria
- Performance Verification
- Recording of Conduct of Test
- System Restoration to Normal After the Test
- Independent Verification of Critical Steps or Parameters

For procedure MTX 205.7.1.2/TP400/.2, "IC-V3&4 Rewiring to Remote Shutdown," it was observed that there was independent verification of Step 9.15 and 9.17. This was done on account of temporary changes, the placement and removal of jumpers.

For procedure MTX 132.7.1.6/TP349.2, "Functional Test for Smart Auto Signal Selector (SASS)," it was noted that precautions were listed by reference to another document (ref 2.1.2). It was agreed that the precautions would be relisted in paragraph 6.1. In addition, it was noted that enclosure 4 for calibration information on test equipment was not filled out for many pages (156 to 170). This was not done because the same test equipment, as shown on the first page, was used over and over again and would have to be relisted repeatedly on the other sheets of enclosure 4. SU/T management agreed to complete the data of enclosure 4 prior to test result approval.

For MTX 132.7.1.1/TP300/.1, "Power Rewire for ICS/NNI Modules," it was observed that the "QA/QC Witness Sign-off Sheets" had not been completed even though the entire test had been monitored by QA/QC. The test results had been approved by the Startup and Test Manager. SU/T management has agreed to provide a deadline in the pertinent administrative procedure to collect the information from QA/QC and to complete the QA/QC Witness Sign-off Sheets. This licensee action will be tracked under Unresolved Item 50-289/88-22-02.

For MTX 132.7.1.6/TP349/3, "Functional Test of the ABT" it was agreed to provide a clarification for Test Deficiency D5 and D2. For the case of D2, the D2 notation will be shown near the stamp for the duplicate page to clarify that D2 is the reason for the retest. The above clarifications will be provided prior to test results approval.

3.0 QA/QC Interface (35744B)

A review was made of the following QA/QC interface items with the post modification testing program:

- Surveillance performed by QA/QC for the post modification testing
- QA/QC requirements for hold points, notification points and witnessing points for the verification of test preparations and test results.

A number of QA Monitoring Reports and Quality Deficiency Reports were obtained from QA to assess their involvement with modification testing. These QA reports are listed in Attachment C.

The available reports, including some "Quality Control Plant Inspection Reports (PIRs)" (unlisted), indicate adequate involvement in the post modification test program in the form of test witnessing by QA and witnessing of hold points by QC. Good findings and observations were made in both the QA and QC reports.

For example, Quality Deficiency Report HRH-038-88, identified that TP349/3, "Functional Testing of the ABT," major test changes had not been reviewed by the Test Approval Group (TAG) prior to testing. Such review by TAG is a requirement under SP-002, "Test Procedure Generation/Approval/Change," part of Administrative Procedure 5000-ADM7335.01(-4), which states, in part, under Para. 4.3.3.2: "TAG shall perform a detailed multi-disciplinary review of all functional...test procedures and revisions thereto." The first response by Startup and Test was rejected by Operations QA. Licensee's corrective action for the above concern will be reviewed during future NRC inspection.

4.0 Review of the Test Approval Group (72701)

The Test Approval Group (TAG) activities and responsibilities were reviewed by the inspector. These activities and responsibilities are described in the "Startup and Test Manual (ref. 1). The following observations were made:

- (1) TAG review of test procedures and test procedure changes is required but TAG meeting are not required to resolve comments. Such comments can be resolved via comment sheets. There are a few TAG meetings. Most comments are resolved via the comment sheets (see ref. 3).
- (2) A Release to Startup and Test (RSU/T) Notice is not always required to commence testing. The conditions under which the RSU/T Notice is not required prior to testing are described in paragraph 4.2.3 of procedure SS-002, "Test Procedure Documents." The licensee stated that this exception caused some problems in the past. Administrative Procedure 1043 is presently being revised to eliminate the RSU/T Notice. The start of testing will now be controlled via the job orders.
- (3) TAG approval of test results is no longer required. The Startup and Test Manager signs off on the test results after review of comments. Revision 1 of procedure SP-001, "Startup and Test Program and Test Requirements," eliminated TAG review of test results. The reasons for this decision are shown in reference 2.

The test program was executed with success and with relatively few test exceptions, in spite of the procedural concerns discussed in the above observations.

References

- (1) TMI-1 Administrative Procedure No. 1047, Rev. 4, "Startup and Test Manual," approved on February 4, 1988.
- (2) GPU Nuclear Memorandum, "Test Approval Group (TAG) Review of Test Results," dated October 31, 1985.
- (3) GPU Nuclear Memorandum, "Request for TAG Comments," dated June 23, 1988.

5. Plant Tours

The inspector made a tour of the plant including the control building with the main control room and the switchgear rooms, auxiliary building, intermediate building, and the turbine building to observe plant operations and equipment installed during the last refueling outage.

It was noted that the Intermediate Building temperature at elevation 335 ft., near the main steam stop valves, was in excess of 130°F (could not touch railing of stairs). There is no safety related equipment in the area. The temperature, however, is too high for human occupation of the area.

Except for the observation detailed above, no other unacceptable conditions were noted.

6.0 Unresolved Items

Unresolved items are matters about which more information is required in order to determine whether they are acceptable, items of noncompliance, or deviations. New unresolved items in this report are identified in paragraphs 2.1, and 2.2.

7.0 Exit Interview

At the conclusion of the site inspection, on August 26, 1988, an exit interview was conducted with the licensee's senior site representatives (denoted in Section 1). The findings were identified and inspection items were discussed.

At no time during this inspection was written material provided to the licensee by the inspector. Based on NRC Region I review of this report and discussions held with licensee representatives during this inspection, it was determined that this report does not contain information subject to 10 CFR 2.790 restrictions.

Attachment A

Selection of Modification Packages

<u>Indent. No.</u>	<u>Description</u>
A25A35920	Removal of RC Pump Speed Sensing Network
A25A35930	Addition of NSCCW Check Valve
A25A30534	ICS/NNI Circuit Reliability Upgrade
A25B30491	Reg. Guide 1.97 Loop Upgrade, Neutron Flux
A25D30244	Remote Shutdown Panel System
A25F31668	Replacement of Core Flood Valve 1 A & B Motors

Attachment B

Test Procedure/Results Review

<u>MTX No.</u>	<u>Description</u>	<u>Test Proc. No.</u>
132.7.1	<u>ICS/NNI Upgrade</u>	
132.7.1.1	Instruments	TP-300/0
132.7.1.1	Power Rewire for ICS/NNI Modules	TP-300/0.1 (Appvd 8-15-88)
132.7.1.2	Electrical (1430-EL-2)	TP-400/0
132.7.16	Functional Testing of the SASS Units	TP-349/2
132.7.1.6	Functional Testing of the ABT	TP-349/3
132.7.1.6	Functional Testing of MS-V-4A/B MS-V-3A-F	TP-349/4
132.7.1.6	Functional Testing of ICS Control Loops on Loss of Power at Cold Shutdown	TP-349/5
132.7.1.6	ICS/NNI, "Hand," "Auto," "Fan" Power Change	TP-349/6
132.7.1.6	Functional Testing of ICS Control Loops on Loss of Power at Hot Shutdown	TP349/7
152.7.1	<u>Reg. Guide 1.97 Instrument Loop Upgrade Modifications</u>	
152.7.1.1	Instruments	TP300/0
152.7.1.2	Electrical (1420-EL-2)	TP400/0
155.7.1	<u>Addition of NSCCW Check Valve</u>	
155.7.1.3	Hydrostatic Testing of NS-V-205 and Piping	TP200/1.1
155.7.1.5	Mechanical	TP200/0
155.7.1.5	Flow and Backseat Leakage Verification	TP200/0.1

153.7.1	<u>Regulatory Guide 1.97 Neutron Flux Monitoring System</u>	
153.7.1.1	Instruments	TP-300/0
153.7.1.2	Electrical (1420 EL-2)	TP-400/0
153.7.1.6	Functional Test of Neutron Flux Monitors NI-YE-11&12	TP-358/2
201.7.1	<u>RC Pump Speed Switch Removal</u>	TP-400/0
201.7.1.2	Verification of RCP Oil Lift & Lube System Alarm/Control Circuits After Removal of RCP Speed Sensing Network	TP400/0.1
205.7.1	<u>IC-V3&4 Rewiring to Remote Shutdown</u>	
205.7.1.2	Electrical (1420-EL-2)	TP400/0
205.7.1.2	IC-V3 Control Circuit Test	TP400/0.1
205.7.1.2	IC-V4 Control Circuit Test	TP400/0.2

Attachment C

QA Monitoring Reports (MRs)

<u>MR or QDR No.</u>	<u>Specific Activity</u>	<u>Date Performed</u>
HRH0497-88	ICS/NNI Functional	7-28-88
HRH0498-88	Fire Pump FS-P-2 Control Circuit	7-28-88
HRH-0507-88	ICS/NNI "Hand," "Auto," "Fan," "Power Change	7-06-88
JBM-0544-88	Functional Testing of ICS Control Loops on Loss of Power at Cold Shutdown	8-09-88
HRH-0564.88	ICS/NNI "Hand," "Auto," "Fan," "Power" Change Test Deta	8-18-88
HRH-0565-88	Functional Test of Aux. Fuel Handling Bridge TV Camera Positioning System	8-18-88
HRH-038-88 (QDR)	Quality Deficiency Report for Unsat Item in HRH-0497-88 (See above)	8-02-88
HRH-047-88 (QDR)	Use of Test Deficiencies in lieu of Test Exceptions (where a 50/59 form for Safety Environmental Impact Determination is required)	8-18-88