

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
Region I

Report No. 50-289/82-18

Docket No. 50-289

License No. DPR-50 Priority Category C

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

Facility Name: Three Mile Island Nuclear Station, Unit 1

Inspection at: Middletown, Pennsylvania

Inspection conducted: September 20-24, 1982

Inspectors: *E. Shaub* 10/7/82
E. Shaub, Reactor Inspector date signed

G. Napuda 10/7/82
G. Napuda, Reactor Inspector date signed

Approved by: *D. L. Caphton* 10/8/82
D. L. Caphton, Chief, MPS date signed
Section, DETP

Inspection Summary:

Inspection conducted on September 20-24, 1982; Inspection Report
No. 50-289/82-18:

Area Inspected: Routine unannounced safety inspection by two region based
inspectors of licensee action on previous inspection items. The inspection
involved 76 hours onsite and 6 hours in office by two region based inspectors.

Results: No violations were identified.

DETAILS

1. Persons Contacted

B. Ballard, Modifications/Operations Quality Assurance Manager
D. Barrilla, Administrative Clerk
E. Brown, Training Specialist
*J. Colitz, Plant Engineer
*S. DiVito, Design Drafting Supervisor
P. Donnachie, Radiological Field Operations Manager (Acting)
R. Fenti, Quality Control Manager
*J. Fornicola, Operation Quality Assurance (QA) Manager
R. Harbin, Technical Analyst
R. Harper, Corrective Maintenance Manager
W. Heysek, Site Audit Supervisor
*H. Hukill, Director, TMI-1
*J. Hunter, QA Auditor
R. Knief, Dr., Plant Training Manager
N. Kazanas, Manager of Quality Assurance
G. Lawrence, Lead Instrument and Control Foreman
V. Orlandi, Instrument and Control Engineer
*J. Marsden, QA Engineer, Mod/Ops
S. Martin, Shift Foreman
S. Newton, Supervisor License Operator Training
R. Nevling, Acting Manager, TMI Information Management Department
M. Ross, Plant Operations Manager
*H. Shipmen, Operations Engineer
D. Shovlin, Manager Maintenance and Construction
*C. Smyth, Licensing Manager TMI-1
P. Snyder, Preventive Maintenance Manager
H. Wilson, Preventive Maintenance Supervisor

NRC

*R. Conte, Senior Resident Inspector TMI-1
*A. Fasano, Chief, TMI Resident Section
*F. Young, Resident Inspector TMI-1

The inspectors also interviewed control operators, shift supervisors, technical support and administrative personnel during the inspection.

*denotes those present at the exit interview, September 24, 1982

2. Licensee Action on Previous Inspection Finding

(Open) Inspector Follow Item (289/80-21-12): Plant personnel training following modification activities not adequately addressed. The inspector reviewed Administrative Procedure (AP) 1043, "Control of Plant Modifications", Revision 4, September 10, 1982 which addresses the post modification

training for operations and maintenance personnel. Plant Engineering is developing a training program/procedures that will address initial training (indoctrination) as well as post modification for plant engineering personnel. During the phone conversation of October 1, 1982, the licensee's representative stated that the plant engineering training program/procedures would be completed by December 30, 1982. Review of the plant engineering training program/procedures and the implementation of post modification training for applicable plant personnel (operations, maintenance, and engineering) will be reviewed in a subsequent NRC:RI inspection in conjunction with open items 289/80-21-22 and 289/82-BC-55.

(Closed) Inspector Follow Item (289/80-21-16): Failure to provide internal event reports for further management review. The inspector reviewed AP 1044, Event Review and Reporting Requirements Revision 7, June 8, 1982 and other reporting mechanisms to verify the licensee has a system(s) to refer event reports to management for independent evaluation. The inspector reviewed the current AP-1044 file to verify that all operational events were being evaluated by plant management. In addition to the administrative system for event review the Operations Manager performs daily reviews of all shift turnover sheets and weekly detailed reviews of all operating log. No violations were identified. This item is closed.

(Open) Inspector Follow Item (80-21-22): Various apparent inadequacies in the training program for non-licensed personnel. Licensee Audit Report S-TMI-82-07 (August 27, 1982) describes the results of a recent audit of the Training Department during which only one deficiency was identified (records transferring). However, corrective action on a number of previously identified deficiencies was still in process. This item remains open pending further review of the timeliness of corrective action with respect to audit findings and selective review of program implementation.

(Closed) Unresolved Item (289/81-21-02) Surveillance procedures 1302-14.1 and 1302-6 which provide for calibration of Technical Specification and Inservice Inspection related instruments do not address computer scheduling of these instruments or the responsibilities of the Generation Maintenance System (GMS) Coordinator for scheduling. Also, procedures AP 1010, 1302-6, and 1302-14.1 did not provide a means for ensuring that computer scheduling would be appropriately changed when these surveillance procedures change. The inspector reviewed draft procedure 1001J, Technical Specification Surveillance Testing Program, that replaces AP 1010, to verify that the GMS coordinator's responsibilities include scheduling all Technical Specification surveillance testing and any necessary changes resulting from changes to surveillance procedures. In addition the inspector compared the latest instrument additions/deletions in surveillance procedures 1302-14.1 and 1302-6 against the computer schedule to verify that the GMS coordinator was making the necessary scheduling changes. No violations were identified. This item is closed.

(Closed) Violation (81-22-01): Uncontrolled drawings in use; drawings without latest update; errors in drawing distribution; and poor control

of engineering procedure issuance. Drawing control and the manner in which as-installed plant configuration is depicted and made readily available to appropriate personnel was examined and is discussed in paragraph 3 of this report. The implementation of licensee corrective action and the resulting evolution of the program necessitates redefinition of goals that must be accomplished prior to restart. This redefinition appears in paragraph 3. Based on the foregoing this item is closed for record purposes.

(Closed) Unresolved Item (81-22-04): Assure that design change notices that are no longer applicable to a drawing so annotated are deleted from being referenced on controlled copies of that drawing. Based on the discussions in paragraph 3 and Item 81-22-01 above this item is also closed for record purposes.

(Closed) Unresolved Item (81-22-05): Develop procedure for use of Integrated Drawing List and evaluate whether interim drawings should be integrated into the list. Based on the discussions in paragraph 3 and Item 81-22-01 above this item is also closed for record purposes.

(Closed) Unresolved Item (81-22-06): Method to be developed to ensure that interim drawings can withstand constant use. Based on the discussions in paragraph 3 and Item 81-22-01 above this item is also closed for record purposes.

(Closed) Inspector Follow Item (289/81-27-02) Procedures do not provide a means for implementation or documentation of housekeeping cleanliness zones for maintenance as required by ANSI N45.2.3. The inspector reviewed the TMI Operational Quality Assurance Plan which commits the licensee to ANSI N45.2.3 with the exception of the establishment of housekeeping zones. Additionally the inspector reviewed the revised procedures AP1008 Good Housekeeping; AP-1020, Fluid System Cleanliness; and, AP 1030, Control of Access to Primary System Openings, to verify that these procedures implement the licensee's approved Quality Assurance Plan for housekeeping. No violations were identified. This item is closed.

(Closed) Restart Item (289/82-BC-33) NUREG 0680, TMI-1 Restart Evaluation Report; item 2.2.1.c Shift Turnover. The licensee has committed to evaluate the effectiveness of the shift turnover procedure by: 1) requiring applicable department heads to periodically review/sign their department shift turnover log sheets; 2) require the Operational Quality Assurance group to periodically audit and review the effectiveness of shift turnover. The inspector discussed review of the shift turnover logs and/or sheets with the applicable department heads (Operations, Maintenance and Radiological Field Operations) and reviewed the department logs to verify that the logs and/or turnover sheets were being reviewed and signed on a periodic basis (In most cases daily during the work week).

The inspector discussed Quality Assurance coverage of shift turnover and logs with the Operational Quality Assurance Manager. The manager stated that coverage of operations shift turnovers was incorporated into the QA

monitoring program in September 1980 to be done on a monthly basis and that monitoring of maintenance and radiological field operations shift turnovers will be performed on a less frequent basis, commensurate with level of plant activities. In addition, the inspector reviewed Audit 80-17, Normal Plant Ops TMI-1, and several monthly monitoring reports for 1982 that monitored and evaluated shift turnover effectiveness. No violations were identified. This item is closed.

(Open) Inspector Follow Item (82-BC-55): Management of operations experience; modification training to operations personnel. This item is an ASLB Partial Decision requirement (Training II.A. PID II.M-10(a) to (c)). The subject requirements are closely related to the concerns expressed in Items 80-21-12 and 22 above and are an integral part of the discussion (refer to subject item) of the status of training non-licensed personnel. All three items will be reviewed further during a subsequent inspection to verify adequate and timely action.

(Closed) PID Item (289/82-BC-56): Verify that operators do not rely solely on computer information for making operational decisions (ASLB Partial Initial Decisions, B. Plant Design Procedures Modifications, II.K). The inspector reviewed plant procedures, specifically Emergency and abnormal procedures, to identify procedures that reference the use of computer indication for immediate and/or secondary verification action. Only one procedure used the computer for indication, 1203-16, High Reactor Coolant Pump Bearing Temperature.

The inspector walked through (simulated) the immediate and follow-up actions and verifications with two licensed Control Room operators, to determine if the operators used the process computer during their actions, for EP 1202-6C, Loss of Reactor Coolant/Reactor Coolant Pressure and EP 1202-35, Loss of Shutdown Cooling (Decay Heat Removal). In addition discussions were held with the Shift Supervisor and Shift Foreman about the use of the process computer during routine and abnormal/emergency operations. Based on the above the inspector determined that the operators rely first on Control Room Console indications then on an alternate method such as the computer, strip charts or other available indications. This item is closed.

(Closed) TAP Item (289/82-SC-08) Thermal Mechanical Report - Effect of High Pressure Injection on Vessel Integrity for Small Break Loss of Coolant Accident (SBLOCA) with no auxillary feed. TMI Action Plan (TAP) item II K.2.3 requires that emergency procedures be revised to include a requirement that operators limit reactor pressure following any significant cooldown transient to no higher than equivalent to 50°-100°F subcooling. The inspector reviewed Emergency Procedure (EP) 1206B, "Loss of Coolant/Reactor Coolant Pressure (SBLOCA) causing Automatic Initiation of High Pressure Injection Revision 13, June 17, 1982, to verify that the requirement to limit reactor pressure to 50°-100°F subcooling was incorporated. The information was provided by Babcock and Wilcox (NSSS) in the form of Pressure and Temperature curves for Reactor Coolant Pumps on and off conditions and specific procedural steps to limit pressure to maintain 50°-100°F subcooling.

In addition the inspector audited a licensed operator requalification lecture on Pressurized Thermal Shock (PTS) that addressed cooldown transients and the applicable emergency procedures to verify adequate training was being provided for pressurized thermal shock. This item is closed although the PTS issue is still being evaluated by the NSSS and NRC-NRR and may necessitate further changes to operating and emergency procedures.

3. Drawings and Drawing Changes Control

3.1 References

- AP 1001C, Drawing Distribution Control, Rev. 2
- AP 1001G, Procedure Utilization, Rev. 3
- AP 1043, Control of Modifications, Rev. 4
- EP 002, GPUN Drawings, Rev. 4
- EMP 016, Plant Configuration Control List, Rev. 0

3.2.1 Program Review

The inspector held discussions with responsible licensee personnel about the methods and manner in which as-installed plant conditions and configurations are depicted; the controls used for disseminating this information to those having need of it; and, the ready availability of this information to users of drawings. The inspector also reviewed the drawing distribution listing, integrated drawing list, interim drawing list and the memos updating the listings.

3.2.2 Findings

One individual has been assigned the responsibility for maintaining controlled drawing files/sticks at designated locations throughout the plant (e.g., Control Room, I&C Shop, Electrical Maintenance). The drawing control system is tailored to the recently revised design change/modification control system. The system provides for annotation of an "as-built" drawing when it is affected by an "as-installed" condition resulting from a completed modification. This annotation identifies the particular "as-installed" interim drawing/sketch which is then attached to the affected drawing. The attached drawing/sketch is to clearly depict only the changes. However, the program does not address those drawings that are still annotated with the superceded system's identifiers and require the user to proceed to the administrative building where those interim drawings/sketches are kept. This omission is discussed further in paragraph 3.3.2 below.

No violations were identified.

3.3.1 Implementation

The inspector sampled the drawings listed below including the identified interim changes at the specified location to determine the following.

- Only controlled drawings were in use
- Drawing distribution was as required
- Drawings were of the current revision
- Required drawing updating was done (e.g. annotation and interim sketches/drawings attached)
- Drawings and interim drawings/sketches were legible and any damage did not affect completeness of information
- As-installed interim information was readily available

Control Room

- C-302-081, Feedwater, Rev. 23
- C-302-101, Condensate, Rev. 29 (DCN-DC 0167)
- C-302-202, River Water System, Rev. 22 (DC 0156)
- C-302-231, Fire Service Water, Rev. 29 (AB/467, DCN-DC0378 and MCG-57)
- C-302-610, Nuclear Service Closed Cycle Cooling Water, Rev. 28 (DC 0116, FCN-C002502)
- C-302-640, Decay Heat Removal, Rev. 28 (FCNs-C001216, 1428, 1429, 1430, 1431 and MCGs 32, 76)

I&C Shop

- C-210-370, Nuclear Instrumentation and Protection System Subassembly Cabinet 2, Rev. 7
- E-304-083, Feedwater Plan, Rev. 3 (FCN-C002511)
- E-304-086, Emergency Feedwater, Rev. 14 (FCNs-C001211, 1212)
- C-600-312, Auxiliary Control System Detailed Schematic Makeup and Protection System Part 3, Rev. 0 (FCN-C2144)

Electric Maintenance Shop

- C-201-136, Electric Arrangement ICS 0-7 Terminal Cabinet, Rev. 1 (FCN-C00959)
- C-201-137, Electric Arrangement Transient Monitor Patch Cabinet, Rev. 1 (FCN-C00959)
- C-201-138, Electric Arrangement Terminal Monitor Patch Cabinet, Rev. 1 (FCN-C00959)
- B-201-220, Electric Arrangement-Halon System and Fire Damper Relay Enclosure, Rev. 0 (MCG-5R1)
- E-206-022, One Line and Relay Diagram 4160v Engineered Switch Safeguards Switchgear (as-installed interim MCG-83)

- E-206-032, One Line and Relay Diagram, Engineered Safeguards, Screen House, Reactor Building H&V 480v Switchgear (as-installed MCG-83)
- E-210-006, Wiring Diagram-T Blocks for Control Room Console CL, Sheet 2T, Rev. 16 (AB/478, MCGs-10, 18, 67, FCNs C001212, 4043, DC0390)

Mechanical Maintenance

- C-302-101, Condensate, Rev. 29 (DCN-DC0167)
- C-302-202, Riverwater System, Rev. 22 (DC0156)
- C-302-640, Decay Heat Removal, Rev. 28 (FCNs-C001203, 1204, 1216, 1428, 1429, 1430, 1431, and MCG-32, 76)
- C-302-661, Makeup and Purification Piping Flow Diagram, Rev. 21 (MCG-8)

3.3.2 Findings

The inspector noted significant improvement in the licensee's drawing controls since this area was previously inspected (see NRC Inspection Report 50-28. 81-22), however the following were identified.

- As installed interim drawings FCNC002511 (E-206-022 and 032); MCGs 18 and 67, DC0390, and FCNC004043 (E-210-006); FCNC002511 (E-304-083); and, FCNC-001212 (E-304-086) ranged from minimum legibility to illegibility.
- Drawings C-201-136, 137 and 138; C-302-231 and 610; E-206-022; and, E-210-006 were annotated directing the user to proceed to the Administrative Building for the as-installed information.
- FCNs C000113 (MCG-94) and C003726 (MCG-137) were filed at the Electrical Shop as controlled interim as-installed drawings but were not traceable to their respective as-built drawings.
- Drawing C-302-661 had only MCG-8 attached that depicted a valve and a small portion of the line to which it had been added. However, this line which included other valves and connections did not appear on the as-built drawing. The inspector discussed this inconsistency with the Design Drafting Supervisor who was aware of the deficiency and had already researched the problem. Apparently other interim as-installed drawings depicting the entire line and connections had been inadvertently omitted when the most recent as-installed drawing had been issued. Further, this licensee representative provided documentation that indicated corrective action had been initiated.

- A drawer identified as "Mercury Drawings Control Console" at the I&C Shop drawing files contained many drawings. These drawings were annotated "Controlled" and approximately one-half were additionally annotated "Void" and/or "As-Built." The inspector determined these drawings were not in the drawing control system. The Administrative Clerk accompanying the inspector initiated immediate corrective action.

Licensee Audit S-TMI-82-18, TMI-1 Plant Maintenance, was in progress during this inspection. Also, Audit S-TMI-82-11, Information Management, had recently been completed. The inspector discussed both audits with the licensee auditors and the Site Audit Supervisor. The cognizant auditors indicated (as well as the report of the latter audit) that adverse findings identified by the auditors included ones identical or similar to those discussed above (drawing C-302-661 excepted).

The licensee is still in the process of corrective action as a result of adverse findings identified during a previous NRC inspection (see Report 50-289/81-22). Major revisions to the methods and manner in which design changes/modifications and documents/drawings are controlled have been initiated. As a consequence the program has undergone a process of evolution that is still continuing. Because of the significant change in management controls and the findings of this inspection, the inspector determined that previous and current concerns and issues needed to be redefined. Previously identified items in this functional area were closed (see paragraph 2) and licensee management was informed at the conclusion of this inspection (see paragraph 1) that the following must be completed prior to Unit 1 startup (criticality) for those drawings that are determined to be necessary to the safe operation (including shutdown) of the plant.

- Interim as-installed drawings/sketches are legible
- Drawings be annotated as to interim as-installed documents affecting that drawing and that information be readily available to the user of the drawing
- Interim as-installed drawings be either traceable to the applicable as-built drawing or incorporated into the as-built drawing numbering system
- Annotations of design changes/modifications that no longer apply to a drawing be cancelled/removed /voided from that drawing
- Uncontrolled drawings at any location that are not controlled be clearly identified as such

This item is unresolved pending further review during a subsequent inspection to verify that the above specified actions have been completed. (289/82-18-01)

The licensee acknowledged the inspector's statement.

No violations were identified.

4. Management Meeting

Licensee Management was informed of the scope and purpose of the inspection at the entrance interview conducted on September 20, 1982. The findings of the inspection were periodically discussed with licensee representatives during the course of the inspection. An exit interview was conducted on September 24, 1982, (see paragraph 1 for attendees) at which time the findings of the inspection were presented.