



AUGUST 17 1982

UNITED STATES
NUCLEAR REGULATORY COMMISSION

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Docket No. 50-289

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MEMORANDUM FOR: Atomic Safety and Licensing Appeal Board for TMI-1 Restart

FROM: Gus C. Lainas, Assistant Director for Operating Reactors
Division of Licensing, NRR

SUBJECT: BOARD NOTIFICATION - (BN-82-84) - TMI-1 RESTART HEARING

The enclosed inspection report (IR 50-289/82-07) concerns an incident where uncontrolled radiation worker training examinations were discovered by the Licensee's staff and were reported to the NRC site staff on May 11, 1982 (Item 7, page 17 of the enclosure). This issue relates to thereopened proceeding on cheating wherein Licensee's exam administration practices were examined. As noted in the inspection report, Region 1 considers that adequate corrective action was taken by the Licensee as a result of this incident.

Original Signed By:
G. C. Lainas

Gus Lainas, Assistant Director
for Operating Reactors
Division of Licensing

Enclosure:
As Stated

cc w/enclosure:
See next page

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SURNAME	RJacobs,cf	JStolz	GLainas				
DATE	8/2/82	8/10/82	8/17/82				

JUL 01 1982

Docket No. 50-289

GPU Nuclear Corporation
ATTN: Mr. H. D. Hukill
Director, TMI-1
P.O. Box 480
Middletown, Pennsylvania 17057

Gentlemen:

Subject: Inspection 50-289/82-07

This refers to the routine safety inspection conducted by Messrs. R. Conte and D. Haverkamp of this office on May 11, 1982, through June 8, 1982, of activities authorized by NRC License No. DPR-50 and to the discussions of our findings held by Messrs. R. Conte and D. Haverkamp with Mr. R. Toole and other members of the GPU Nuclear staff at the conclusion of the inspection.

Areas examined during this inspection are described in the NRC Region I Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, measurements made by the inspector, and observations by the inspector.

Based on the results of this inspection, it appears that one of your activities was not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith as Appendix A. This violation has been categorized by severity level in accordance with the NRC Enforcement policy (10 CFR 2, Appendix C) published in the Federal Register Notice (47 FR 9987) dated March 9, 1982. You are required to respond to this letter and in preparing your response, you should follow the instructions in Appendix A.

The responses directed by this letter and the accompanying Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the

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requirements of 2.790(b)(1). The telephone notification of your intent to request withholding, or any request for any extension of the 10 day period which you believe necessary, should be made to the Supervisor, Files, Mail and Records, USNRC Region I, at (215) 337-5223.

Your cooperation with us in this matter is appreciated.

Sincerely,

Original Signed By,

R. Keimig for

Richard W. Starostecki, Director
Division of Project and Resident
Programs

Enclosures:

1. Appendix A, Notice of Violation
2. NRC Region I Inspection Report Number 50-289/82-07

cc w/encls:

R. J. Toole, Operations and Maintenance Director, TMI-1
C. W. Smyth, Supervisor, TMI-1 Licensing
E. G. Wallace, Manager, PWR Licensing
J. B. Liberman, Esquire
G. F. Trowbridge, Esquire
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
Commonwealth of Pennsylvania
Ms. Mary V. Southard, Co-Chairman, Citizens for a Safe Environment
(Without Report)

JUL 01 1982

bcc w/encls:

Region I Docket Room (with concurrence)

L. Barrett, Deputy Program Director, TMI Program Office

J. Goldberg, OELD:HQ

Chief, Operational Support Section (wo/encls)

Ms. Mary V. Southard, Co-Chairman, Citizens for a Safe Environment

Chief, TID

Resident Inspector, Oyster Creek

OFFICE	TMIS <i>28</i>	TMIS <i>DeV</i>	TMIS <i>6/1</i>	TMIS <i>5/1</i>	DE&TP <i>DB</i>	EIB <i>HW</i>	DPRP#2 <i>6</i>	DPRP <i>ja</i>
SURNAME	FYoung/Imp	DHaverkamp	RZonte	AFasano	DBeckman	LBettenhausen	RKeimig	RStarosteck
DATE	6/22/82	6/24/82	6/24/82	6/24/82	6/24/82	6/24/82	6/24/82	6/24/82

APPENDIX A

NOTICE OF VIOLATION

GPU Nuclear Corporation
Three Mile Island Unit 1

Docket No. 50-289
License No. DPR-50

As a result of the inspection conducted on May 11, 1982, through June 8, 1982, and in accordance with the NRC Enforcement Policy (10 CFR Part 2, Appendix C), 47 FR 9937 (March 9, 1982), the following violation was identified.

10 CFR 50, Appendix B, Criterion V, and the NRC approved Operational Quality Assurance Plan, Revision 9, May 28, 1981, Section 3.1, require in part that activities affecting quality be prescribed by and accomplished in accordance with instructions or drawings of a type appropriate to the circumstances.

Contrary to the above, as of June 4, 1982, a safety related modification (designated task LM-9, Relocation of Pressurizer Level Transmitters and Transmitter Supports) was not accomplished in accordance with drawing B-308-854, Revision IA-0. Certain transmitter sensing lines did not have a continuous downward slope at 1 inch vertical per 1 foot horizontal as required by the drawing.

This is a Severity Level V Violation (Supplement I).

Pursuant to the provisions of 10 CFR 2.201, GPU Nuclear Corporation is hereby required to submit to this office, within 30 days of the date of this Notice, a written statement or explanation in reply, including (1) the corrective steps which have been taken and the results achieved; (2) corrective steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved. Under the authority of Section 182 of the Atomic Energy Act of 1954, as amended, this response shall be submitted under oath or affirmation. Where good cause is shown, consideration will be given to extending your response time.

Dated _____

Original Signed By:

R. Keimig for

Richard W. Starostecki, Director
Division of Project and Resident
Programs

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Region I

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Report No. 50-289/82-07
Docket No. 50-289
License No. DPR-50 Priority -- Category C

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

Facility: Three Mile Island Nuclear Station, Unit 1

Inspection at: Middletown, Pennsylvania

Inspection conducted: May 11, 1982 - June 8, 1982

Inspectors:	<u>R. Conte</u>	<u>June 24, 1982</u>
	R. Conte, Senior Resident Inspector	date signed
	<u>D. Haverkamp</u>	<u>June 29, 1982</u>
	D. Haverkamp, Senior Resident Inspector	date signed
	<u>H. Nicholas</u>	<u>June 28, 1982</u>
	H. Nicholas, Reactor Inspector (June 2-4, 1982)*	date signed
	<u>S. Richards</u>	<u>June 28, 1982</u>
	S. Richards, Reactor Inspector (June 1-4, 1982)*	date signed
	<u>F. Young</u>	<u>June 23, 1982</u>
	F. Young, Resident Inspector (TMI-1)	date signed
Approved by:	<u>A. Fasano</u>	<u>June 25/82</u>
	A. Fasano, Chief, Three Mile Island Section Projects Branch No. 2	date signed

*denotes dates of inspection

Inspection Summary:

Inspection conducted on May 11, 1982 - June 8, 1982, (Inspection Report Number 50-289/82-07)

Areas Inspected: Routine safety inspection by resident and regional-based inspectors (200 hours) of licensee action on previous inspection findings; plant operations during long term shutdown, including TMI-1 restart modifications-task status, and senior resident inspector turnover; steam generator recovery program; restart preoperational and startup testing; restart modifications; training department exam control; and in office review of licensee event reports. !

Results: Of eight areas inspected, one violation was identified (failure to install modification as designed, paragraph 6.c).

Details

1. Persons Contacted

General Public Utilities (GPU) Nuclear Corporation

- R. Adamiak, Project Control Manager (TMI-1), Administration
- C. Adams, Quality Assurance Engineer I, Nuclear Assurance
- *B. Ballard, Manager TMI Quality Assurance Modifications/Operations, Nuclear Assurance
- R. Barley, Lead Mechanical Engineer TMI-1
- *J. Burgess, Administrative Assistant, Technical Functions
- W. Craft, III, Radiological Assessor, Radiological Controls
- J. Colitz, Plant Engineering Director TMI-1
- C. Davis, Modification Control Coordinator
- E. Eisen, Engineer III-Projects, Technical Functions
- T. Faulkner, Planning and Scheduling Manager, Maintenance and Construction
- R. Fenti, Quality Control Manager, Nuclear Assurance
- J. Fritzen, Technical Functions TMI-1 Site Supervisor
- M. Graham, Engineer, Technical Functions
- H. Henry, Engineer Assistant Senior II, Nuclear Assurance
- N. Hollerbush, Document Supervisor, Maintenance and Construction
- H. Hukill, Vice President and Director TMI-1
- R. Knief, Manager Plant Training, Nuclear Assurance
- R. Long, Vice President Nuclear Assurance
- *S. Levin, Maintenance and Construction Director (TMI-1), Maintenance and Construction
- W. Miller, Nuclear Licensing Engineer, Technical Functions
- *R. Neidig, Communications Specialists, Communications
- M. Nelson, Manager Safety Review-Nuclear, Nuclear Assurance
- *V. Orlandi, Lead I&C Engineer, TMI-1
- M. Ross, Manager Plant Operations TMI-1
- *C. Smyth, Supervisor TMI-1 Licensing, Technical Functions
- C. Stephenson, Nuclear Licensing Engineer, Technical Functions
- J. Stott, Administrative Nuclear Technical Training, Nuclear Assurance
- J. Tietjen, Engineer Assistance Senior II, Nuclear Assurance
- *R. Toole, Operations and Maintenance Director TMI-1
- H. Wilson, Supervisor Preventative Maintenance TMI-1

The inspector also interviewed several other licensee employees during the inspection. They included control room operators, maintenance personnel, engineering staff personnel and general office personnel.

*denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Inspector Follow Item 289/79-IR-10: Inadequate Plant Operations Review Committee (PORC) review of surveillance procedure changes. The status of completed corrective measures and matters that require satisfactory resolution for this item were described in NRC Region I Inspection Report 50-289/82-06.

The licensee's actions regarding PORC member training are acceptable as described below:

- The TMI-1 PORC training program requirements are described in an approved section of the TMI Training Department Administrative Manual. Revision 0 of the PORC Training Program, dated December 1, 1980, supersedes the requirements of TMI-1 Training Department Procedure TD 4201, dated July 3, 1980. The inspector reviewed the current training program description and determined that the licensee's commitments for training PORC members, including (1) Technical Specifications use and content; (2) design basis accidents and transients; and (3) TMI-1 non-routine reporting requirements are provided in addition to training in other subject matters.
- Lesson plans have been developed for PORC training and are included in the training handout package.
- All designated TMI-1 PORC members completed the initial PORC/Independent Safety Review Training Program in May 1982.
- A quiz has been prepared, which will reinforce the completed training. The quiz is designed as a take-home review of the training subject matter and will be administered to all PORC members by July 1982.

(Closed) Inspector Follow Item 289/80-22-104: NUREG-0600, Investigation Into the March 28, 1979, Three Mile Island Accident, review. During the NRC Region I health physics evaluation of TMI-1, the inspectors reviewed the status of licensee corrective actions in response to NUREG-0600. The inspectors were not able to verify acceptable completion of corrective actions at the time of their inspection. However, actions have been taken by the licensee to satisfactorily complete all health physics and emergency preparedness corrective actions related to NUREG-0600 findings, as described in NRC Region I Inspection Reports 50-289/81-07, 50-289/81-20, 50-289/81-28, and 50-289/82-05.

(Closed) Unresolved Item 289/80-26-01: Discrepancy between required and installed anchor bolt size for pressurizer level transmitter supports associated with task LM-9, Relocate Pressurizer Level Transmitters and Transmitter Support Modification. The inspector reviewed the standard instrument bracket drawings and the Anchor Installation Documents (AID) for task LM-9 and noted that one-half inch self-tapping anchor bolts were required and used.

(Closed) Unresolved Item 289/80-26-02: Inadequate spacing between anchor bolts. The inspector reviewed Gilbert Associates, Inc., March 3, 1981, Design Guide TMI-0412-2, Design Guide Concrete Self-Drilling Expansion Shell Anchors. This design guide provides instructions for the

calculation to determine the maximum load placed on an anchor bolt when the anchor bolt spacing is less than recommended distance. The inspector also reviewed task LM-9 for calculations requirements used for the installation of type II standard instrument mounting brackets. The calculations were found to be in accordance with the requirements.

3. Plant Operations During Long Term Shutdown

a. Plant Operations Review

The plant remains in cold shutdown with the Reactor Coolant System (RCS) temperature less than 200°F per NRC Order of August 9, 1979. During this inspection, the RCS has remained partially drained in preparation for Once Through Steam Generator (OTSG) tube plugging operation. The reactor core continues to be cooled via the Decay Heat Removal (DHR) system. Both OTSGs were maintained at a water level of 300 inches on the secondary side except for sample periods during which the OTSGs were filled and placed in a recirculation mode for a representative sample.

Inspections of the facility were conducted to assess compliance with general operating requirements of Section 6 of Technical Specifications in the following areas: licensee review of selected plant parameters for abnormal trends; plant status from a maintenance/modification viewpoint including plant cleanliness; control of documents including log keeping practices; licensee implementation of the security plan including access controls/boundary integrity and badging practices; licensee control of ongoing and special evolutions including control room personnel awareness of these evolutions; control of documents including log keeping practices; and implementation of radiological controls.

Random inspections of control room during regular and back shift hours were conducted at least three times per week. The selected sections of the shift foreman's log and control room operator's log were reviewed for the period May 11, 1982 to June 8, 1982. Selected sections of other control room daily logs were reviewed for the period from midnight to the time of review. Inspections of areas outside the control room occurred on May 18, May 20, June 2, and June 8, 1982. Selected licensee planning meetings were also observed.

Also during this inspection period, another aspect of the licensee's system to evaluate the effectiveness of the Quality Assurance (QA) Program at TMI-1 and TMI-2 was observed. On May 26, 1982, the QA Department (QAD) conducted a review of 1981 QAD inspection findings with TMI-1 and TMI-2 plant management. Open discussion occurred on problem areas in program/procedure compliance in various functional areas. Recommendations along with specific actions remained to be finalized and will be included in a subsequent QAD report on the licensee's review. NRC will continue to routinely follow this area.

No violations were identified.

b. Senior Resident Inspector Turnover

During this period a turnover of NRC Senior Resident Inspector responsibilities for TMI-1 occurred. The relieving inspector, in conjunction with the outgoing inspector, reviewed selected documents and made observations in plant to ascertain the following:

- status of plant conditions
- status of completion of restart modifications and subsequent testing/plant acceptance
- status of steam generator tube repairs
- status of NRC restart inspection program implementation
- familiarization of major issues raised (opened or closed) during the NRC restart hearings and previous NRC inspections, including those from special inspections since the TMI-2 accident (NRC investigation into TMI-2 accident, performance appraisal review, health physics evaluation, emergency planning evaluation, and near term operating license review).

The turnover was effective as of May 30, 1982.

No violations were identified during this review.

c. TMI-1 Restart Modifications - Task Status

The inspector held discussions with licensee management representatives and reviewed licensee scheduling/status documentation for facility modifications, which are required to be completed prior to or following TMI-1 restart. The purpose of the review was to determine that modification task completion status (completed/in progress/scheduled, etc.) was consistent with commitments and requirements delineated in the following documents.

- TMI Restart Report, Report in Response to NRC Staff - Recommended Requirements for Restart of Three Mile Island Nuclear Station Unit 1
- NUREG-0680 (and Supplements 1, 2, and 3) TMI-1 Restart Evaluation Report, to comply with NRC Order of August 9, 1979
- NRC letter to Met-Ed dated April 22, 1981, Safety Evaluation Reports for Items Contained in NUREG-0694
- NRC letter to Met-Ed dated April 22, 1981, Safety Evaluation Reports for Items Contained in Enclosure 1 to NUREG-0737
- NUREG-0746 (and Supplement 1), Emergency preparedness Evaluation for TMI-1

- NUREG-0752 (and Supplement 1), Control Room Design Review Report for TMI-1
- ASLB Partial Initial Decision dated August 27, 1981, Procedural Background and Management Issues
- ASLB Partial Initial Decision dated December 14, 1981, Plant Design and Procedures and Separation Issues
- ASLB Partial Initial Decision dated December 14, 1981, Emergency Planning Issues
- selected IE Bulletins and related licensee responses, licensee event reports and related Technical Specifications, and License Orders and Technical Specification Amendments

As of June 7, 1982, 22 of the 86 modification tasks currently required for TMI-1 restart have been completed and accepted by plant staff. Of the 22 accepted modifications, 14 were reviewed by NRC inspectors with findings appropriately addressed in this and other inspection reports.

4. Steam Generator Recovery Program

a. Background

Repressurization of the Reactor Coolant System (RCS) in November 1981 revealed leakage of tubes in both Once Through Steam Generators (OTSGs). In December 1981, a steam generator recovery program task force was established to coordinate and direct all actions regarding the investigation and repairs to the steam generator tube leaks. During the period of December 1981 through April 1982, the licensee has conducted extensive eddy current testing and metallurgical analysis on removed sections of steam generator tubes. Metallurgical analysis has established that circumferential cracks were all initiated from the tube inside surface (primary side). The cracks occurred mainly within the upper tube sheet in the top portion of the tubes. During March 1982, the licensee completed the first portion of the OTSG tube plugging which included tubes with removed sections and tubes that had observed leakage (see NRC Region I Inspection Report No. 50-289/82-06). To broaden the metallurgical data base, portions of 10 additional steam generator tubes were removed during May 1982.

An engineering evaluation during this inspection period was performed to determine what tubes will be permanently removed from service. From this evaluation, one hundred and seventy five tubes including the ten tubes described above and those tubes with eddy current indications below the upper tube sheet, will be stabilized and/or plugged. Babcock and Wilcox's standard inconel rod threaded to a standard weld cap will be the method of stabilization. The length of the inconel rod is 109 inches allowing the tube stabilization down to the fourteenth support plate. Tube stabilization is expected to commence on June 10, 1982.

b. Review

The inspector has continued to monitor the steam generator repair program to verify the following items.

- accuracy of information related to the event submitted to NRC
- stability of plant conditions, including provisions for decay heat removal
- procedures in accordance with the specifications of the licensee programs
- adequacy of procedures used to control the activity

c. Findings

The inspector reviewed selected sections of tube stabilization documents and visually inspected several test weld blocks. Observation of field operations of tube removal was conducted on one occasion. The inspector interviewed several licensee and contractor personnel and determined that adequate control was being exercised. No violations were identified.

5. TMI-1 Restart Preoperational and Startup Testing

a. Overall Startup Test Program

The inspector reviewed the overall test program for TMI-1 restart with the Manager Startup and Test TMI-1 to determine completion status of test procedure preparation, test performance and test results evaluation. The licensee representative discussed some of the problems and discrepancies identified by startup and test personnel during preoperational functional tests and equipment calibrations recently completed. The inspector noted that several preoperational test procedures, startup test procedures, and the revised TMI-1 Startup and Test Master Test Index had been approved since the last inspection of this area. The scope and findings of the inspector's review of these items are described below.

b. Final Heatup and Power Escalation Testing Prerequisite List Review

The inspector reviewed Prerequisite List for Final Heatup and Power Escalation Testing, Revision 0, approved April 30, 1982, and discussed with the startup manager, the following items.

- pretest requirements
- system completion status to support heatup and power escalation testing
- outstanding items or exceptions

- radiological controls items requiring resolution prior to restart
- quality assurance (QA) restart validation summary reports
- tests to be conducted as part of final heatup and power escalation testing
- technical specifications including technical specification surveillance
- procedures needed for startup, heatup and power escalation testing
- test procedure exceptions and deficiencies list
- restart modifications certification checklist

The licensee representatives acknowledged the inspector's comments on the prerequisite list and informed the inspector that the responsibility of the prerequisite list is being transferred to projects control for documentation and tracking of all inputs. The inspector had no further questions on this item. This area will be routinely followed during subsequent inspections.

c. Preoperational and Startup Test Procedure Review

(1) General

The inspector reviewed three preoperational test procedures and one startup test procedure related to facility modifications (listed below) which are required to be completed prior to and during TMI-1 restart to verify that adequate testing would be provided consistent with the following items.

- licensee commitments stated in the TMI-1 Restart Report, Report in Response to NRC Staff Recommended Requirements for Restart of Three Mile Island Nuclear Station Unit 1
- requirements delineated in NUREG-0680 (and Supplements 1, 2 and 3), TMI-1 Restart Evaluation Report, to comply with NRC Order of August 9, 1979
- licensee commitments stated in the TMI-1 Restart Test Planning Specification, Revision 0, dated April 8, 1981
- applicable regulatory guides
- the licensee QA program
- applicable licensee procedures for preoperational and startup testing

For each of the listed modifications the inspector verified that the modification task would be demonstrated acceptable for restart operation by an appropriate functional or calibration test. The inspector reviewed each test procedure for (a) technical/administrative adequacy of management review and approval, (b) procedure format, (c) test objectives (clearly stated and met), (d) prerequisites, (e) environmental conditions, (f) acceptance criteria, (g) technical references, (h) initial conditions, (i) test performance documentation and verification, (j) detailed instructions for performance of test, (k) recording details of conduct of test, (l) restoration of system to normal after test, (m) indication of personnel conducting test and evaluating test data, and (n) independent verification of critical steps or parameters. Specific modification tasks, modification design references, and preoperational and startup test procedures reviewed by the inspector are identified below.

(2) Modification Task LM-25a, Post Accident Effluent Monitoring - Gaseous

References

- TMI-1 Restart Report Section 2.1.2.1, Post Accident Monitoring
- NUREG-0680, Item 8-2.1.8.b, Increased Range of Radiation Monitors

The inspector reviewed TP 366/4, Revision 0, Post Accident High Range Containment Purge Monitor Calibration, approved April 30, 1982, and TP 366/5, Revision 0, Post Accident High Range Condenser Off-Gas Monitor, approved April 30, 1982. Both test procedures 366/4 and 365/5 provide an appropriate calibration test by performing an electrical alignment of the Hi-Hi Range Containment Purge Duct Gaseous Effluent Monitor. These procedures also verify the proper operation of the associated alarms in the channel.

(3) Modification Task RM-14, High Pressure Injection Cross Connect

Reference

- Partial Initial Decision (PID), Volume II, Section 0, paragraph 943, High Pressure Injection Cross - Connection and Cavitating Venturies

Test procedure 655/1 provides an appropriate functional test to demonstrate the operability of the high pressure injection system with the addition of cavitating venturies and cross-connection lines. Adequate high pressure injection (HPI) flow will be available for core cooling by preventing extensive HPI loss from a break in the HPI line or at a point near the

HPI cold leg nozzle. The system will automatically perform the balancing of HPI flow and maintain an adequate seal injection flow for reactor coolant pumps.

- (4) Modification Task RM-4A, Connect Incore Thermocouples to Computer and Modification Task RM-4B Incore Thermocouples Backup Display System

References

- TMI-1 Restart Report Section 2.1.1.6, Instrumentation to Detect Inadequate Core Cooling
- NUREG-0680, Item 8-2.1.3.b, Instrumentation for Detection of Inadequate Core Cooling

The inspector reviewed TP 846/1, Revision 0, Incore Thermocouple Functional Test at Power, approved April 30, 1982. Test procedure 846/1 provides an appropriate functional test to verify that the new connections to the incore thermocouples did not change the proper operation of the incore thermocouples at a nominal power plateau of 15%, 40%, 76%, and 100% of rated power; that the incore thermocouples give an accurate indication of the temperature distribution in the core; and those thermocouples which are symmetric to one another, give comparable readings. This functional test will also verify that the Bailey Computer System is capable of displaying and printing all incore thermocouple temperature readings, and the incore thermocouple display panel in the control room will give an accurate indication of the temperature distribution in the core.

(5) Findings

The inspector determined that each of the preoperational and startup test procedures was technically and administratively adequate. No discrepancies were noted in the review of these procedures.

d. Preoperational Test Results Evaluation

The inspector reviewed five completed test procedures (listed below) to ascertain whether uniform criteria are being applied for evaluating completed preoperational tests to assure technical and administrative adequacy.

- TP 334/1, Revision 0 (test results evaluation approved August 24, 1981), Engineered Safeguards Actuation Logic Test
- TP 334/2, Revision 0 (test results evaluation approved August 24, 1981), Engineered Safeguards Actuation Component Test

- TP 366/2, Revision 0 (test results evaluation approved May 3, 1982), Containment Isolation on High Radiation-Valve Functional Test
- TP 645/1, Revision 0 (test results evaluation approved April 1, 1982), TSAT Functional Test
- TP 426/2, Revision 0 (test results evaluation approved August 24, 1981) 4KV E.S. Bus Undervoltage Relays Functional Test

The inspector reviewed the test results and verified licensee evaluation of test results by the following methods.

- review of test changes
- review of test exceptions
- review of test deficiencies
- review of "as-run" copy of test procedure
- review of QA inspection records
- review of test results evaluations and approvals

No discrepancies were noted during review of the above completed test procedures and evaluation of test results, except in test procedure 334/1, Engineered Safeguards Actuation Logic Test, Revision 0. Test procedure 334/1 has six test deficiencies to be resolved at a later date. They are D-73, D-78, D-84, D-86, D-88, and D-97.

Licensee resolution of the above test deficiencies is unresolved and will be reviewed during a subsequent NRC inspection (289/82-07-01).

e. Operation Quality Assurance (OQA) Document Review (DR)

The inspector reviewed seven document review summary sheets (listed below) to verify the adequacy of the review of approved test procedures by the OQA Modifications/Operations Section.

- OQA Document Review (DR) No. SP 172/82A of TP 248/1, Revision 0, December 16, 1981, Backup Instrument Air
- OQA DR No. SP 156/82A of TP 657/1, Revision 0, March 5, 1982, Non-Nuclear Instrumentation
- OQA DR No. SP 169/82A of TP 600/3, Revision 0, August 22, 1981, Thermal Expansion Checks for Piping Hangers and Supports
- OQA DR No. OPS 135/81A of TP 664/1, Revision 0, August 13, 1981, PORV Flow Indication

- OQA DR No. OPS 141/81A of TP 645/1, Revision 0, August 4, 1981, Main Steam Safeties Acoustic Monitor
- OQA DR No. SP 135/82A of TP 622/1, Revision 0, September 3, 1981, Diesel Generator Load Test

Criteria for meeting OQA Plan compliance were reviewed in the following references.

- Maintenance Modifications and Support Activities, Document Review Checklist, QAM/O-0, approved July 16, 1980
- TMI-1 Startup and Test, Test Instructions of Startup and Test Manual, Revision 1, approved January 9, 1982

As a result of the review of these references, OQA document review sheets, test procedures and discussions with licensee representatives, no discrepancies were noted. The inspector had no further questions in this area.

6. TMI-1 Restart Modifications - Implementation

a. General

The inspector reviewed one facility modification which is required to be completed prior to TMI-1 restart to verify that the new design provided is consistent with the following items.

- licensee commitments stated in the TMI-1 restart report, Report in Response to NRC Staff - Recommended Requirements for Restart of Three Mile Island Nuclear Station Unit 1
- requirements delineated in NUREG-0680 (and supplements), TMI-1 Restart Evaluation Report, to comply with NRC Order of August 9, 1979
- industry codes and standards to which the facility was constructed (or as approved by Office of Nuclear Reactor Regulations)
- applicable regulatory guides
- the licensee QA program
- applicable licensee procedures for modification design, procurement, installation, and construction testing

The inspector verified that modification task LM-9, Relocate Pressurizer Level Transmitter and Transmitter Support Modifications, was performed, in accordance with the approved design based upon

(1) observation of completed work, (2) examination of installation records, (3) review of Nondestructive Examination (NDE) and/or other inspection records, and (4) review of related modification task documentation. Specific modification task observations and records reviewed by the inspector are identified below.

b. Modification Task LM-9, Relocate Pressurizer Level Transmitters and Transmitter Support Modification

Reference

(1) Partial Initial Decision (PID), dated December 14, 1981, Section II, paragraph 1174

(2) Modification Description

Task LM-9 required modification of the pressurizer level transmitter installation by relocating all three pressurizer level transmitters to an elevation above the maximum calculated flood level from design based accidents.

The plant configuration changes associated with Task LM-9 included installation of transmitter and tubing supports, relocation of effected equipment, and calibration and testing of the transmitters and associated equipment after completion of the work.

(3) Documentation Reviewed/Observations

The inspector reviewed selected sections of the following documents related to Task LM-9.

- Engineering Change Modification (ECM) S-014, Revisions 0, 1, 2, 2.a, 2.b, and 2.c, Relocate Pressurizer Level Transmitters (RC-1-LT1, LT2, LT3) and Transmitter Support Modifications
- ECM S-014, Modification Package (licensee accepted September 18, 1981)
- purchase requisitions/orders (PR), PR 86528 and 86531; quality control inspection reports; cable pull termination sheets; work authorization notices; field questionnaires; instrument calibration data sheets; "as-built" drawings; and construction test data (TP 1302-5.12)
- Maintenance Procedure 1410-Y-57, Revision 1
- Specification 1101-43-003, Revision 0
- Design guide TMI-0412-2

In addition to the above documentation review, the inspector conducted a system walkdown of the plant modifications associated with Task LM-9. The inspector observed the installed equipment and verified the component location and installation was as described in applicable modification documentation.

(4) Findings

Based on the modification documents reviewed by the inspector and the observations of installed equipment and components, the inspector determined that Task LM-9 was satisfactorily completed in conformance with the above referenced commitments and requirements, except as described below.

- (a) The inspector noted that interim drawing B-308-854, Revision IA-0, approved for construction, required all transmitter sensing lines be sloped 1 inch vertically for each foot of horizontal run to avoid formation of gas pockets in the sensing lines. Anchor Installation Documents (AID) for transmitters RC1-LT1A and RC1-LT2A state that transmitter lines drop 1 inch per foot. Additionally, the as-installed drawing B-308-854, dated November 2, 1981, indicated all lines slope 1 inch vertically per 1 foot horizontal run. The sensing lines for transmitter RC1-LT2A do not slope continuously downward towards the transmitter in a manner to avoid forming a gas pocket. The failure to properly construct the modification in accordance with drawings is an apparent violation of section 3.1 of Operational Quality Assurance Plan and 10 CFR 50, Appendix B, Criterion V (289/82-07-02).
- (b) The inspector noted that specification 1101-43-003, Revision 0, Furnishing and Installation of Concrete Self Drilling Expansion Anchor Shells, section 4.2.4, requires bolts be tightened one quarter turn after the nut, washer, attachment (support), and concrete have come into contact. The inspector observed that the head of bolt 'A' for support number RC1-LT1, associated with transmitter RL1-LT1A, was not in contact with the plate and could therefore not meet the requirement. This item appeared to be an isolated example of nonconformance with specification 1101-43-003, and is considered unresolved pending thorough review of the licensee actions regarding pipe support modifications in response to IE Bulletins 79-02 and 79-14 (289/82-07-03).
- (c) Inspection of the completed work by the inspector revealed the following apparent discrepancies.
 - There was a misapplication of labels for cable leads to transmitters RC1-LT1A and LT3A. Transmitter LT2A had no labels.

-- A calibration data sheet was not updated with proper transmitter serial number (SN) versus transmitter designation (RC1-LT3A is SN 72012).

The licensee subsequently reported the correction of these discrepancies. The corrective actions will be verified during a subsequent NRC inspection. (289/82-07-04).

Also during this review, the inspector identified that the "as-built" drawing (B-308-854) did not describe the actual installation. Valves labeled as RCV-1050 and RCV-1051 are located on an isolation and equalization manifold upstream from transmitter RC1-LT1A while the drawing identified these valves as located upstream of the manifold. The inspector further noted a label attached to the manifold for RC1-LT2A was imprinted as RCV-207 for RC1-LT1A. The as built drawing does not make reference to RCV-207. Licensee action associated with the updating of "as-built" drawings with respect to a previous inspection finding is still in progress. This item will be reviewed in conjunction with an NRC inspection of "as-built" drawing corrective actions (289/81-22-01).

- (d) As stated, the intent of task LM-9 was to relocate the pressurizer level transmitters above the maximum calculated water level in the reactor building during design basis accidents. Task RM-8 raised the steam generator level transmitters for the same reason. The inspector noted that Inter-Office Memorandum GEM 3397 for task LM-9 stated the calculated water level to be 4'6" above the 281' elevation. Volume 1 of the Atomic Safety and Licensing Board Partial Initial Decision (PID) dated December 14, 1981, paragraph 1170, indicates that the licensee testified the calculated level to be 5.66 feet. The reference point for this level was not stated in the PID. Discussion with licensee personnel indicated the correct level to be 5.66 feet above the 281' elevation. Task LM-9 required the bottom of all three transmitters to be located at least 6 feet above elevation 281'. The inspector observed that the bottom of two of three pressurizer level transmitters and all three steam generator transmitters relocated per task RM-8 are slightly less than 6 feet above the reactor building floor but greater than 5.66 feet. The inspector questioned the exact elevation of the reactor building floor at the transmitter location. Although the elevation is generally referred to as being 281', the licensee could not immediately determine the actual floor elevation. The inspector also noted that the NRC staff has been ordered

by the PID to verify the licensee calculation of the water level. This item is unresolved pending licensee evaluation of the transmitter location with respect to the flood level reference point and the NRC staff verification of the water level calculation (289/82-07-05).

There is one significant incomplete work list item related to Task LM-9, which is unresolved and requires correction prior to TMI-1 restart. This incomplete work list item requires the junction boxes and transmitters associated with the modification to be properly bolted closed (289/82-07-06).

7. Uncontrolled Training Examinations

While conducting a review of radiation worker training records on May 5, 1982, the licensee's Radiological Assessor observed that (1) radiation worker examinations were on an open shelf in the radiation worker training supervisor's work area (cubicle) which was left unattended, (2) several different radiation worker examinations and their answer keys were in the same unattended cubicle in an open drawer of a filing cabinet that had no lock, and (3) these conditions existed both during and after normal working hours. The Radiological Assessor reported these observations to senior licensee management on May 5 and 7, 1982, and to the NRC site staff on May 11, 1982. Licensee management subsequently informed the NRC site staff on several occasions about the corrective actions being taken. This included a Training and Education Department review of practices for assuring examination security both at Three Mile Island and Oyster Creek.

The licensee concluded that the reported May 5, 1982, observations regarding security of radiation worker examinations did not represent conditions in any other training sections. It appeared to be an isolated incident attributable to a single individual's practices. The corrective actions taken at TMI included (1) development and use beginning May 10, 1982, of new General Employee Training exams on a day to day basis as needed for classes and locking exam copies and answer keys when not in use, (2) initiating development of a new set of five exams with increased attention to completion and implementation of random question bank examinations, and (3) reprimand of the cognizant supervisor. In addition, various concerns regarding general security of examinations were identified which will be addressed by Training and Education Department personnel.

Details of the licensee's review, corrective actions and related concerns were described in training department memorandum to the Vice President - Nuclear Assurance, dated May 21, 1982. Based on review of this memorandum and discussions with senior licensee management, the inspector determined that adequate corrective measures have been taken or planned to resolve both the specific problem identified on May 5, 1982, and the more general issues raised by the licensee's review. The inspector had no further questions concerning this matter.

8. Licensee Event Reports (LERs) - In-Office Review

The inspector reviewed the LERs listed below, which were submitted to the NRC Region I office, to verify that the details of the event were clearly reported, including the accuracy of the description of cause and the adequacy of corrective action. The inspector determined whether further information was required from the licensee, whether the event should be classified as an Abnormal Occurrence, whether the information involved with the event should be submitted to Licensing Boards, whether generic implications were indicated, and whether the event warranted onsite followup.

The following LERs were reviewed.

- LER 82-001/01T-0, dated March 17, 1982, (While performing control room habitability review per NUREG-0737, Item III D.3.4, it was identified that control building ventilation system modification did not include any provisions for automatic isolation on high airborne radioactivity in the fuel handling building to exclude the potential for contaminants entering the control building system.)
- LER 82-002/03L-0, dated April 4, 1982, (Inspection of leakage deposits from valve WDG-V4, a containment isolation valve for the Radioactive Waste Gas Disposal System, led to the discovery of two cracks in associated piping.)
- LER 82-003/01T-0, dated March 21, 1982, (While regenerating demineralizer beds, an auxiliary operator inadvertently caused the secondary neutralizing tank (SNT) to overflow. Approximately 2,500 gallons of 3 to 5 PH water were released to the river.)
- LER 82-004/01T-0, dated April 29, 1982, (While performing pressurizer code safety valve review per NUREG-0737, Item II.D.1, it was identified from the EPRI valve testing program that a potential problem existed. The problem will require additional evaluation of TMI-1 safety valves.)
- LER 82-005/03L-0, dated May 5, 1982, (Station liquid effluent radiation monitor required by T.S. 3.21-1, was discovered to be inoperable due to failure of the sample pump.)
- LER 82-006/03L-0, dated May 27, 1982, (An incorrect valve lineup on reactor building purge effluent monitor system resulted in a failure to meet Technical Specifications requirements for specific instrumentation to be operable.)
- LER 82-007/03L-0, dated June 3, 1982, (Iodine channel of purge effluent monitor RM-A9 failed low causing the required number of channels specified by Technical Specifications not to be available.)

- LER 82-008/01T-0, dated May 26, 1982, (While returning "C" Reactor Coolant Bleed tank to service following being opened for maintenance, the oxygen concentration exceeded Technical Specifications limit of two percent.)

The above LERs were closed based on satisfactory in-office review except LERs 82-001, 82-002, 82-004, 82-005, 82-006, and 82-007. Licensee corrective actions for those LERs will be reviewed during a subsequent inspection.

9. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. Unresolved item disclosed during the inspection is discussed in paragraphs 5.d, 6.b(4)(b), 6.b(4)(c), 6.b(4)(d), and 6.b.(4) (second paragraph).

10. Inspector Follow Items

Inspector follow items are inspector concerns or perceived weaknesses in the licensee's conduct of operation (hardware or programmatic) that could lead to violations or deviations if left uncorrected. Inspector follow items are addressed in paragraph 2.

11. Exit Interview

Meetings were held with senior facility management periodically during the course of the inspection to discuss the inspection scope and findings. The inspectors met with the licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on June 8, 1982, and summarized the purpose and scope of the inspection and the findings. The licensee representatives acknowledged the findings.