

U.S. NUCLEAR REGULATORY COMMISSION

50320-820514

Region I

Report No. 50-320/82-05

Docket No. 50-320

License No. DPR-73 Priority -- Category C

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

Facility Name: Three Mile Island Nuclear Station, Unit 2

Inspection At: Middletown, Pennsylvania

Inspection Conducted: April 25 - May 22, 1982

Inspectors: Elc McColo, Sr 6/22/82
R. Conte, Senior Resident Inspector (TMI-2) date signed

Elc McColo, Sr 6/22/82
T. Moslak, Radiation Specialist date signed

Elc McColo, Sr 6/22/82
B. O'Neill, Radiation Specialist date signed

Elc McColo, Sr 6/22/82
L. Thonus, Resident Inspector (TMI-2) date signed

Approved by: Elc McColo, Sr 6/22/82
A. Fasano, Chief, Three Mile Island Section date signed
Projects Branch No. 2

Inspection Summary:

Inspection conducted April 25 - May 22, 1982, (Inspection Report Number 50-320/82-05)

Areas Inspected: Routine safety inspection conducted by site inspectors of licensee action on previous inspection findings; routine plant operations; routine health physics and environmental areas; radioactive material shipments; reactor building (RB) entries; licensee event reports (LERs); licensee action on NRC bulletins; and reactor coolant system processing. The inspection involved 161 inspector-hours.

Results: No violations were identified.

Details

1. Persons Contacted

General Public Utilities (GPU) Nuclear Corporation

D. Carl, Plant Operations
*S. Chaplin, Licensing Engineer
*J. Garrison, Quality Assurance (QA) Auditor
R. Hahn, Supervisor, Waste Shipping and Disposal
R. Hanson, Radiological Controls Technician
*J. Hildebrand, Director, TMI-2 Radiological Controls
T. Illjes, Shift Supervisor
*L. King, Director Site Operations
*G. Kunder, Technical Specifications Supervisor
J. Lawton, Electrical Engineer
*J. Larson, Manager TMI-2 Licensing
H. McGovern, Shift Supervisor
*R. Neidig, GPU Communications
P. Newkirk, Deputy Manager, Radiological Field Operations
K. Norman, Radiological Controls Technician
*C. Rowe, Lead QA Auditor
P. Ruhter, Manager Radiological Technical Support

Bechtel Corporation

D. Machiela, Reactor Building Entry Coordinator

*denotes those present at the exit interview

2. Licensee Action on Previous Inspection Findings

(Closed) Inspector Follow Item (320/78-17-03): Licensee to resolve Plant Operation Review Committee (PORC) Action Item (PAI) as a result of NRC Circular 77-14, Separation of Contaminated Water Systems from the Noncontaminated Plant. PAI No. 2-78-022 was issued to determine the adequacy of the subject separation with respect to TMI-2. The inspector reviewed PORC meeting No. 79-12, March 19-22, 1979, minutes and notes that this action item was resolved. The documents reviewed included a list of all connections between contaminated and noncontaminated systems, including a list of spool pieces associated with these systems. The Spent Fuel Pool Cooling System and Demineralized Water System Operating Procedures were revised. A Maintenance Procedure (1410-Y-45, Revision 0, October 19, 1978) was issued to control the installation and removal of spool pieces.

(Closed) Inspector Follow Item (320/78-32-07): Licensee to resolve PAI No. 2-78-051 on Environmental Qualification of Safety Related Equipment. As a result of licensee review of Licensee Event Report (LER) No. 78-54/03, PAI No. 2-78-051 was issued to assure the environmental qualification of CA-V3, 4A, 4B, Motor Operators (Nuclear Sample System Containment Isolation

Valves). The subsequent licensee review (completed December 6, 1978) determined that Class B insulation was used for the wiring associated with these motor operators and that adverse temperature and humidity effects on valve operability were questionable. As a result, the motor operators were to be replaced during the first refueling. The 1979 accident precluded the normal scheduled first refueling. This issue is the subject of NRC Bulletin 79-01 and is considered a Long Term Action Item for TMI-2 and will be separately reviewed during the review of Bulletin 79-01.

(Closed) Unresolved Item (320/78-32-08): Licensee to resolve a PAI No. 2-78-03 as a result of NRC Circular 78-06, Potential Common Mode Flooding of Emergency Core Cooling System Equipment Rooms. This PAI requested Architect-Engineer review of this item. As of May 10, 1982, this action item was not resolved. NRC Circulars and Bulletins are being reviewed separately to determine short term versus long term action with respect to the TMI-2 unique condition. This area will be reviewed during the review of NRC Circular 78-06.

(Closed) Unresolved Item (320/78-36-03): Surveillance Procedure (SP) 2301-S1 to be reviewed and properly implemented. Surveillance Procedure 4301-S1, Revision 13, March 10, 1982, Shift and Daily Checks, replaced 2301-S1 to implement shift and daily checks required by the Recovery Technical Specification. This new procedure was properly reviewed and approved, and no instances of improper implementation were observed.

(Closed) Unresolved Item (320/78-36-04): SP 2301-M4 to be revised to provide appropriate acceptance criteria. Surveillance Procedure 4301-M4, Revision 4, January 5, 1982, Remote Shutdown Instrumentation-Monthly Checks, replaced SP 2301-M4 to implement shift and daily checks required by the Recovery Technical Specifications. This new procedure contains appropriate acceptance criteria.

(Closed) Unresolved Item (320/78-36-05): Adequacy of SP 2303-M13 to implement associated Technical Specification (TS) on accumulated time for Containment Purge Supply and Exhaust Valve Open Times (TS 3.6.1.7). The specific TS requirement was deleted from the Recovery TS and SP 2303-M13 is no longer required to be implemented.

(Closed) Violation (320/78-36-06): Failure to perform surveillance requirements on Containment Isolation Valves during various operational mode changes. Original commitments made by the licensee for this item were associated with power operation procedures and controls. The bases for the commitments are no longer applicable due to the March 28, 1979, accident and NRC Order/License Condition which require the plant to remain in a shutdown condition in accordance with approved operating and contingency procedures for the facility. Present containment integrity requirements were established in SP 4301-M8, Revision 7, April 8, 1982, Containment Integrity Verification-Mode 7.

(Closed) Inspector Follow Item (320/78-36-07): Licensee to institute continuity checks for Nuclear Instrumentation Reactor Protection System (NI/RPS). The NI/RPS is in a tripped condition and is no longer required to be operational. This item is no longer applicable. This area will be reopened if a decision is made to restart TMI-2.

(Closed) Unresolved Item (320/78-37-01): Licensee to revise SP 2305-R to adequately implement Snubber Surveillance requirements. The Recovery TS does not require Snubber Surveillances and SP 2305-R is not effective. This item is not applicable.

(Closed) Unresolved Item (320/78-37-02): Licensee to establish Snubber Maintenance Procedure. The Snubber Surveillance Program is not applicable for present plant conditions and requirements are not addressed in the Recovery TS.

(Closed) Unresolved Item (320/78-37-03): Licensee to request NRC approval of a specific snubber seal material per TS 4.7.8.1. This TS requirement is not in the Recovery TS and therefore, is not applicable.

(Closed) Violation (320/78-38-03): Provide additional fixed seal-beam emergency lights to facilitate emergency operation at Remote Shutdown Panel. Job Ticket C-0747, completed February 5, 1979, relocated emergency lighting units to provide sufficient lighting at the Patch Panel (Remote Shutdown Panel) in the Relay Room.

(Closed) Inspector Follow Item (320/79-02-01): Completion of various license conditions prior to startup following the first regularly scheduled refueling outage. The first refueling outage was never realized and the final disposition of TMI-2 is uncertain. This item is not presently applicable and will continue to be tracked as a license condition pending revision of this section of the TMI-2 license.

(Closed) Inspector Follow Item (320/79-13-08): Establishment of Controlling Document for Containment Integrity Verification. Surveillance Procedure 2301-M8 was deleted and replaced by SP 4301-M8, Revision 7, April 8, 1982, Containment Integrity Verification-Mode 7 to implement TS 3/4.6.1.1 requirements.

(Closed) Inspector Follow Item (320/79-17-22): Operator Proficiency in Use of Special Operating Procedures designated "Z" and "EP". These specially designated temporary procedures (established immediately after the 1979 accident) were deleted. Those that remained applicable were incorporated into the established procedural administrative control system.

Administrative Procedure (AP) 1001, Revision 26, October 20, 1981, TMI Document Control, and AP 1060, Revision 0, March 23, 1981, Procedure Usage and Implementation, require operator review of major changes to

procedures and pre-implementation briefing/training for special evolutions which include special operating procedures. Implementation of these requirements is periodically monitored by NRC.

(Closed) Inspector Follow Item (320/79-22-01): Adequacy of Administrative Controls for Recovery Special Operating Procedures (SOP designated "R"). Specific document control deficiencies with the R-SOP file were corrected at the time of the inspection. The item remained open pending issuance of recovery TS to delineate procedural administrative controls. In the interim, a subsequent NRC inspection identified the failure to properly change a procedure in the R-SOP file. A temporary change notice was subsequently issued for this change.

The Recovery TS were issued in February 1980. The SOP designated "R" file of procedures are not effective. AP 1001 (referenced above) addresses adequate administrative controls for temporary procedures.

(Closed) Inspector Follow Item (320/79-22-03): Adequacy of Operational Preparedness for Balance of Plant (BOP) Diesels. The BOP Diesels were installed (summer 1979) as a recovery system to provide a redundant source of electrical power to secondary plant components being used to cool the reactor coolant system (RCS) via the "A" Once Through Steam Generator. The licensee corrected specific procedural and fire protection discrepancies. The site NRC staff verified the correction to be acceptable.

Subsequent to the establishment of RCS heat transfer to the reactor building ambient mode, the BOP diesels were deleted from the TS and were placed out of service. Procedures governing the operation of the BOP diesels no longer apply.

(Closed) Unresolved Item (320/79-29-01): Licensee to revise reactor building (RB) sump/basement water level measurement procedure to provide updated limit for notifications. The subject procedure R-SOP-2-79-034 no longer applies and Reactor Building water level measurements are to be performed in accordance with 2104-4.47, Revision 3, February 19, 1982, Operation and Removal of RB Sump Level Measurement Equipment at Penetration 401. Approximately one inch of water remains in the RB basement. The concern on high water level in the RB no longer exists.

(Closed) Unresolved Item (320/80-02-01): NRC to review Licensee Event Report (LER) on Makeup and Purification System Leak of February 11, 1980. LER No. 80-04/03L-0, March 11, 1980, was submitted by the licensee and reviewed by the NRC. The evaluation and action as documented by the licensee is acceptable.

(Closed) Unresolved Item (320/80-11-05): Licensee to assure minimum shift composition staffing. The control room log sheet was revised to delineate by name, those individuals assigned to the fire brigade and

assure that personnel will be available to perform reactor operator and auxiliary operator duties. No instances were noted where these measures were not implemented.

(Closed) Unresolved Item (320/80-19-03): Licensee to clarify Plant Operations Review Committee (PORC) membership. The licensee submitted to the NRC a TS change request to clarify PORC membership qualification requirements to provide the PORC with a broad base of engineers from various disciplines. This request was approved by NRC by Order, dated April 7, 1982. PORC training and composition is being reviewed as a separate issue.

(Closed) Unresolved Item (320/81-10-02): NRC to perform final walk down of Submerged Demineralizer System (SDS). In June 1981, the inspector verified overall readiness of the SDS to operate. The inspector also monitored initial startup operations of the SDS. Findings were addressed in NRC Region I Inspection Report 50-320/81-12.

3. Routine Plant Operations

Inspections of the facility were conducted to assess compliance with general operating requirements of TS 6.2.1 in the following areas: licensee review of selected plant parameters for abnormal trends; plant status from a maintenance/modification viewpoint including plant cleanliness; licensee control of ongoing and special evolutions including control room personnel awareness of these evolutions; control of documents including log keeping practices; and, area radiological controls.

Random inspections of the 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 April 25 - May 22, 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 13, 17 and 21, 1982. Selected licensee planning meetings were also observed.

No violations were identified.

4. Routine Health Physics and Environmental Review

a. Plant Tours

Inspections by site radiation specialists included all control points and selected radiologically controlled areas. Observations included these areas.

-- Access control to radiologically controlled areas

- Adherence to Radiation Work Permit (RWP) requirements
- Proper use of respiratory protection equipment
- Adherence to radiation protection procedures
- Use of survey meters including personnel frisking techniques
- Cleanliness and housekeeping conditions
- Fire protection measures

No violations were identified.

b. Measurement Verification

Measurements were independently made by the inspector to verify the quality of licensee performance in the following areas.

- Radioactive material shipping
- Radiological control, radiation and contamination surveys
- Onsite environmental air and water sampling and analyses

No violations were identified.

c. SDS Vessel Shipment

The first shipment of a SDS vessel offsite occurred on Friday, May 21, 1982. SDS vessel number D-15 (D10015) contained approximately 13,000 curies of predominately Cesium 137 and Strontium 90. A special Type B shipping cask was provided for the shipment. The SDS vessel and the shipping cask cavity were inerted with nitrogen in order to meet the requirements of the Certificate of Compliance (COC). The receiver, Pacific Northwest Laboratory (PNL), Richland, Washington will use this vessel as part of their Department of Energy (DOE) sponsored vitrification research and development program.

No violations were identified.

d. State of Washington Suspension of TMI-2 Burial License

The State of Washington banned GPU (General Public Utilities), Three Mile Island Unit 2 (TMI-2), from use of the U.S. Ecology, Richland, Washington, burial site and suspended the TMI-2 burial permit effective 12:00 (noon), May 5, 1982. This action occurred after U.S. Ecology received a TMI-2 shipment of 74 Low Specific Activity (LSA) waste containers; one container, a 55-gallon drum, had a broken locking ring, and the drum was found open. Although no loose radioactive

contamination was evidenced, the breach of the container was identified as an apparent violation of the Department of Transportation (DOT) regulations, and prompted the banning action. Based on corrective actions outlined in a letter from GPU dated May 13, 1982, the state rescinded their ban effective May 18, 1982.

The TMI site radiation specialists have initiated a special inspection (50-320/82-06) concerning the packaging and handling of LSA waste containers.

5. Reactor Building Entries

- a. The site staff monitored reactor building (RB) entries conducted during the inspection period to verify the following on a sampling basis:
- The RB entry was properly planned and coordinated for effective task implementation including adequate as low as is reasonably achievable (ALARA) review, personnel training, and equipment testing.
 - Proper radiological precautions were planned and implemented including the use of a Radiation Work Permit (RWP).
 - Specific procedures were developed for unique tasks and properly implemented.

No violations were identified.

- b. The site staff attended RB entry status meetings; reviewed selected documents, applicable procedures, and RWPs concerning these entries.

Entries 59 through 62 were conducted during this inspection period. A synopsis of the tasks for each entry is below.

- Entry 59 (April 28, 1982) - jet pump installation to remove additional 36,000 gallons of water from the reactor building basement and test of smoke detectors
- Entry 60 (May 5, 1982) - Radiological surveys
- Entry 61 (May 10, 1982) - Radiological surveys and polar crane repair assessment
- Entry 62 (May 13, 1982) - Remote survey of inside D-ring area using RO-7 instrument

A radiation survey in the reactor building (RB) following the removal of approximately 36,000 gallons of water from the basement indicated that the water removal did not significantly reduce the general

radiation levels on the 305 ft. elevation. Areas on the 305 ft. elevation, which are not well shielded from the basement (stairwells and metal gratings), did show a gamma dose rate decrease following the water removal. These areas were previously identified as hot spots with dose rates ranging from 5 R/hr to 28 R/hr. The technician who surveyed the 305 ft. elevation accumulated 105 mR in 14 minutes while performing the survey.

The water level in the basement decreased from approximately six inches to one inch when the 36,000 gallons were pumped from the basement.

- c. During this inspection period, the site radiation specialists completed a review of the licensee exposure tracking system, regarding the reactor building decontamination experiment. Results of the review are included as Attachment 1 to this report.

No violations were identified.

6. Licensee Event Report

The inspector reviewed a Licensee Event Report (LER) required to be submitted in accordance with Technical Specification (TS) 6.9.1.8 and .9 (and NUREG 0161) to verify the following: event and cause description clearly reported event information; the required LER form was properly completed; and adequate corrective action was specified.

Initial screening of this event was completed to determine generic applicability, need for additional site verification, and the necessity for additional NRC management review.

LER 82-12/03L-0, dated May 14, 1982, Fuel Handling Building ventilation exhaust flow below TS 3.9.12 limits, was reviewed.

No violations were identified.

7. NRC Bulletins

The inspector reviewed the status of licensee response to NRC bulletins which are applicable to current plant conditions. The review included implementation and adequacy of licensee actions and the licensee's administrative controls.

(Closed) Bulletin 79-10: Requalification program statistics. This bulletin required the licensee to provide certain statistics regarding their requalification training programs. The licensee provided the required information in a letter to the NRC dated May 23, 1980. No further licensee action was required.

(Closed) Bulletin 79-23: Potential failure of emergency diesel generator (EDG) field exciter transformer. This bulletin described a potential failure of EDGs due to common grounding of the excitation power transformer and output transformer. The TMI-2 EDG excitation power transformers (EPT) are not grounded, thus cannot share a common ground with the generator. The inspector also reviewed the results of the bulletin recommended 24 hour test run of the EDGs. The inspector had no further questions.

(Closed) Bulletin 79-24: Frozen lines. This bulletin described the potential for damage to safety related equipment due to freezing of lines. The licensee had established an Ad Hoc Winterization Committee composed of representatives from Operations, Maintenance, Engineering and Radiological Controls. The committee is responsible for review, assignment of responsibility, and followup of weatherization of safety related and non-safety related equipment. The inspector examined the meeting minutes of this committee. The committee review included diesel generator heaters, steam lines, sample lines, fire service equipment, storage tanks, and lines to outside tanks. The inspector had no further questions.

(Open) Bulletin 80-05: Vacuum conditions resulting in damage to tanks containing primary system water. This bulletin described vacuum conditions causing inward buckling of tanks holding radioactive liquids and gases. The licensee's review and response divided the subject tanks at TMI-2 into seven separate categories (i.e., tanks with vacuum relief, tanks which are vented to atmosphere, etc.). Five of the categories were adequately protected from vacuum condition at the time of the licensee's initial response.

The licensee's category 7, tanks without adequate vacuum protection, included two tanks. The licensee installed pressure switches on the pumps which took suction from these tanks. The switches trip the pumps on low suction pressure (i.e., low pressure in the tanks). The inspector reviewed engineering change memorandum (ECM 760, Revision 0), which implemented this design change. This change also placed a suction pressure trip protection on the spent resin tank, a tank which does not receive primary system water per se.

During the review of category 6, tanks that are adequately protected, a previous inspection (NRC Inspection Report No. 50-320/81-17) documented an unresolved item (320/81-17-03). The review included the reactor coolant bleed tanks. The adequacy of the use of a pump suction pressure trip for tank protection was questioned. The licensee committed to review the situation and provide an additional response to Bulletin 80-05. The licensee stated that this additional response was planned to be completed in June 1982. Bulletin 80-05 remains open pending receipt and NRC review of the additional response.

The licensee still has bulletin responses outstanding on 79-03A, 79-15, 79-18, 80-24, and 81-01. The licensee stated that responses to these bulletins would be completed in June 1982. This area is unresolved pending receipt and NRC review of the outstanding responses (320/82-05-01).

8. Reactor Coolant System (RCS) Processing

The reactor coolant system had contained high levels of activity (pre-processing concentration of 30 uCi/ml of Cs and Sr) since the March 28, 1979, accident. During the inspection period, the licensee began a "feed and bleed" processing of 50,000 gallons of RCS water as part of the continuing cleanup effort. RCS water was letdown from the "A" RCS loop to reactor coolant bleed tank (RCBT) "C" while water was made up to the "B" RCS loop from RCBT "A".

The inspector observed licensee implementation of Operating Procedure (OP) 2102-3.5, Revision 1, dated May 13, 1982, which was used to perform this evolution. On May 17, 1982, the valve lineups for the evolution were completed, including the closure of MU-V-133, a stop-check valve used to isolate the makeup tank from the process lines. As the "feeding" of the RCS from RCBT "A" commenced, the control room operators noticed a rise in the makeup tank level. They immediately secured the process.

Two individuals were sent to check the position of MU-V-133. This valve is manually operated via extensions (reach rods) due to high radiation fields at the makeup tank. There is no valve position indication at the remote handwheel. One individual checked the valve and was unable to turn the handwheel in the closed direction. However, with two individuals on the handwheel, they were able to cause it to move, and they fully closed the valve. The valve had apparently "frozen" in a position where it was at least partially open. The feed and bleed evolution was reinitiated and successfully completed without further incident.

No violations were identified.

9. 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 if left uncorrected. Inspector follow items are addressed in paragraph 2.

10. Unresolved Items

Unresolved items are findings about which more information is needed to ascertain whether they are violations, deviations or acceptable. Unresolved items are addressed in paragraphs 2 and 7.

11. Exit Interview

On May 24, 1982, a meeting was held with licensee representatives (denoted in paragraph 1) to discuss the inspection scope and findings.

ATTACHMENT 1

Man-Rem During Reactor Building Decontamination Experiment October 27, 1981 - March 26, 1982 (Entries 17-55)

1. Licensee Study

- a. 107.05 man-rem (based on radiation worker permit (RWP): self reader dosimeter or digital numbers)
- b. 0.210 average dose per reactor building work hour
- c. 525 total man-hours in reactor building (licensee estimated 290 hours)

2. NRC Study

- a. 103.49 man-rem (based on permanent TLD record numbers for 1982 and self-reader number for last quarter of 1981)
- b. 0.572 rem per worker (population of 181 workers)
- c. 2.9 average hours in reactor building per individual worker
$$\frac{525}{181} = 2.9 \text{ hours}$$
- d. Categories of Exposure

<u>Exposure Groups</u>	<u>Number of Workers</u>
less than 25 millirem (Anteroom)	15
26-300 millirem	35
301-600 millirem	52
601-1000 millirem	53
1001-1250 millirem	14
1251-2000 millirem	12

3. Conclusions

- a. The licensee self-reader total exposure number is +3.4% of NRC number
- b. Total man-rem expended and licensee estimate agree (estimated 95 man-rem prior to decon experiment)