U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-320/88-12

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: July 8 - August 5, 1988

Inspectors: R. Conte, Senior Resident Inspector
D. Johnson, Resident Inspector
T. Moslak, Resident Inspector (Reporting Inspector)
A. Sidpara, Resident Inspector

Approved by: _____ 9/2/88
C. Cowgill, Chief, Reactor Projects Section 1A Date

Inspection Summary:

Areas Inspected: Routine safety inspection by site inspectors of defueling and decontamination activities, including the proper implementation of radiological controls, housekeeping, fire protection measures, review of selected events, recent management changes, and licensee actions on past circulars.

Results: Licensee personnel conducted clean-up operations in a safe manner. The inspector identified no adverse conditions with respect to the licensee's radiological controls and fire protection programs. Housekeeping in the reactor building improved significantly. Minor procedural implementation problems were identified in the maintenance area as noted in the specific event, concerning the yard engine, as contained in paragraph 2.4 in this report. Licensee actions in response to NRC staff circulars were acceptable.

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DETAILS

1.0 Introduction and Overview

1.1 Defueling Operations

Defueling crews completed removal of the upper flow distributor (UFD) from the reactor vessel and placed it in storage in a modified core flood tank. The UFD was the second of five sections comprising the Lower Core Support Assembly (LCSA). The licensee cut this section into pieces, using the plasma arc technique, and they removed it from the vessel. In preparation for cutting the next plate -- the grid forging -- defueling crews cleared debris from the top and flow holes of the forging. This debris contained a significant amount of chips and dross material created by the drilling and cutting operations, respectively, in addition to short length fuel rods. Workers used manual pick-and-place techniques to clear rods from the forging. Then, they used airlift operations to clear vacuumable debris from in and around the forging.

With the forging cleaned, plasma arc equipment will be installed and cutting operations will resume.

Also, the licensee conducted surveys to determine fuel quantities in other portions of the primary system. In parallel with these surveys, the licensee was in the process of evaluating various defueling techniques should fuel be found.

No shipments of casks containing core debris were made during this reporting period.

1.2 Decontamination/Dose Reduction Activities

Scabbling, steam cleaning, and hands-on decontamination continues in the auxiliary and fuel handling buildings. To date, 119 of 143 cubicles are decontaminated to end point criteria, with three cubicles presently undergoing evaluation to assess their status. The remaining cubicles contain contaminated plant systems that first must be cleaned before the cubicle is decontaminated. Workers are performing flushes on these systems to lower dose rates in these cubicles.

Filling and draining of the block wall in the reactor building (RB) basement is on-going. As a result of the low concentration of contamination in the flush water, the RB sump water is being processed through the EPICOR II water clean-up system, in lieu of the Submerged Demineralizer System (SDS). An evaluation is being performed to determine the effectiveness of the fill-and-drain operation.

Attempts to transfer highly contaminated resins from the "A and "B" make-up demineralizers were unsuccessful. Preparations were being made to install a hydrolance in the "A" demineralizer discharge piping in an effort to break up the material, using high pressure water, to permit

sluicing to a receiver tank. A delumper also is being installed in the recirculation flowpath of the receiver tank to increase the sluicability of the discharged material.

The licensee implemented the initial phase of assessing specific plant areas for eventual placement of these areas into a Post-Defueling Monitored Storage (PDMS) condition. Following its assessment, the seal return cooler/filter room was the first area to be isolated from routine access to assure that it would not become re-contaminated, nor be impacted by other plant operations.

Seven other areas are currently scheduled for verification and subsequently should be isolated from the balance of plant.

1.3 NRC Staff Activities

The purpose of this inspection was to assess licensee activities during defueling and decontamination activities. The inspectors made this assessment through actual observations of licensee activities, interviews with licensee personnel, measurement of radiation levels, or review of applicable documents. NRC staff inspections use the acceptance criteria and guidance of NRC Inspection Procedures (NIP's). These NIP's were annotated in the Table of Contents to this report.

1.4 Persons Contacted

During this inspection, the following key licensee personnel provided substantial information in the development of the inspectors' findings.

-- *J. Byrne, Manager, TMI-2 Licensing
-- *C. Incorvati, TMI Audit Manager
-- S. Levin, Defueling Director
-- W. Marshall, Operations Engineer
-- W. Potts, Director, Plant Operations
-- *J. Rodabaugh, Defueling Task Manager
-- *R. Rogan, Director, Licensing and Nuclear Safety
-- *E. Schrull, TMI-2 Licensing Engineer
-- L. Shamenek, Planning and Scheduling Manager
-- *R. Sieglitz, Manager, Waste Management
-- J. Tarpinian, Manager, Radiological Engineering
-- *D. Turner, Director, Radiological Controls
-- D. Tuttle, Manager, Radiological Field Operations
-- R. Wells, Licensing Engineer

2.0 Defueling/Decontamination Activities

2.1 Scope of Review

The inspector observed and/or reviewed licensee defueling decontamination activities to: (1) ascertain factual status of such activities; (2) assure proper adherence to applicable procedures; and, (3) select and re-

view significant events warranting further inspection follow-up. The inspector also made observations in facility spaces with respect to proper housekeeping, fire protection, and radiological controls. The general acceptance criteria for this review was Section 6 of the TMI-2 Technical Specifications (TS).

In performing the above inspections, the inspectors focused on the following areas of licensee performance:

-- control of operations in progress by supervisory personnel;

-- knowledge of the task by technicians and support persons;

-- appropriateness of governing documents, including procedures and Radiation Work Permits (RWP's);

-- alertness of various controlling station personnel;

-- assess the quality of implementation of selected evolutions witnessed; and,

-- assess the material condition of the plant.

The inspections were made at random intervals and during the following back shift hours (10:00 p.m. and 6:00 a.m.).

Date/Day	Time Periods	Hours
7/16 Saturday	10:00 a.m. - 11:00 a.m.	1.0
7/20 Wednesday	9:30 p.m. - 11:30 p.m	2.0
7/30 Saturday	10:00 p.m. - 11:30 p.m.	1.5

2.2 General Findings

As a result of the routine and off-shift review noted above, the inspectors identified no major discrepancies. In general, licensee representatives properly implemented procedures, except as noted for certain events listed within this report. Addressed below were specific observations in the area of housekeeping, fire protection, and event review. Of particular note was the licensee's low threshold for documenting and reporting off-normal events that were below reporting requirement thresholds.

2.3 Reactor Building Conditions

On August 3, 1988, the inspector entered the reactor building (RB) to evaluate overall radiological and industrial safety conditions. The inspector determined that housekeeping had improved significantly for the radwaste storage areas, equipment staging/repair areas, and general work areas on the 305-foot and 347-foot elevations of the RB.

The inspector also accompanied a defueling crew on the shielded work platform while the team was clearing debris from grid forging holes and verifying the cleanliness of previously cleaned holes. From observing the work in progress, the inspector determined that the activities were conducted in accordance with the procedures and radiation work permits (RWP's).

In support of this RB entry, the inspector reviewed RWP No. 17511 and determined that the protective clothing, respirators, and dosimetry specified were appropriate for the tasks being performed. By attending a pre-job briefing, the inspector concluded that the command/coordination center was adequately staffed with licensed supervisory, engineering support, and radiological controls personnel and that these personnel were cognizant of present RB conditions and the status of on-going activities. No violations were identified.

During this entry, the inspector observed that posting of radiation areas was appropriate, that low dose rate areas were conspicuously marked, and that contaminated equipment and materials were appropriately segregated, bagged, and tagged. For large pieces of contaminated equipment, temporary shielding was installed to lower dose rates in the general area.

2.4 Event Review

A number of events were identified by the licensee in their internal reporting system and they were reported to the resident inspectors.

2.4.1 Inattentiveness to Duty

-- On July 19, 1988, the operator of the RB polar crane was found to be asleep at his operating station. This occurred during a "lull" in activities during the removal of a section of the UFD. The hanging piece was supported by the polar crane wire rope and brake system of which the effectiveness was not dependent on the polar crane operator. He was subsequently discharged from the site.

-- On July 19, 1988, a worker was found to be asleep in the Contamination Control Cubicle (c-cubed). Subsequently, he was discharged from the site.

-- On August 3, 1988, a worker was found asleep in the auxiliary building. He was subsequently discharged from the site.

No licensed operators were involved in the three events described. These events do reflect a continuing problem regarding management of idle time of workers.

2.4.2 Railcar Movement

At approximately 1:30 p.m. on July 26, 1988, a railcar carrying a loaded shipping cask and its unmanned yard engine drifted for approximately 60 yards on site. The engine and railcar came to a final rest as a result of an increase in the natural grade of the rails.

Prior to this occurrence, workers were preparing the cask for shipment off site, but they stopped work because of a severe electrical storm. In their haste, they failed to set the engine's hand brake. Following their departure, the engine's air brake slowly bled off, which released the air brake, and resulted in the engine and railcar slowly drifting. The engine struck a portable traffic sign in its path before coming to rest. No damage occurred to the engine, railcar, or shipping cask. The shipping cask contained seven cans of core debris. No release of radioactive materials occurred. No personnel were injured. There was also no impact on any security boundary for either TMI-1 or 2.

The licensee began an immediate investigation to determine the circumstances surrounding the incident and to establish actions to preclude a recurrence. The root cause was determined to be the failure to set the engine's hand (manual) brake (per the procedure) prior to leaving the engine's cab. Corrective actions included revising the Maintenance Implementing Procedure 4220-IMP-3125.01, "Operation of the Yard Switcher Locomotive," to highlight setting of the hand brake before the operator leaves the engine for any reason, placing a sign in the engine cab directing the operator to apply the hand brake prior to exiting the cab, and retraining all engine operators in the theory and operation of the air and mechanical brake systems. Site inspectors reviewed the licensee's investigation and corrective actions and determined them to be satisfactory.

The inspector also reviewed Licensee Internal Report Serial No. 4420-88-0060, dated July 15, 1988, regarding the results of a trend analysis performed by the licensee's Safety Review Group. The trend analysis was performed on a series of incidents that have recently occurred to identify their root causes and to provide recommendations to site management on what actions should be taken to reduce the frequency of such incidents.

From this review, the inspector concluded that the report was thorough and provided specific actions for licensee management to focus their attention to reduce the frequency of such incidents.

The inspector will continue to monitor the implementation of the licensee's actions to determine their effectiveness.

2.5 Decontamination/Defueling Summary

Defueling/decontamination activities proceeded as planned and were carried out safely. The events noted above did not result in any significant radiological consequence.

The licensee's internal reporting system is an organizational strength; the effectiveness of which is being reviewed by NRC Region I in light of events noted outside this inspection period.

Overall, housekeeping and fire protection measures have steadily improved in the RB and in the balance of plant.

3.0 Management Actions as a Result of Licensee Investigation of Operator Sleeping Issue

On July 20, 1988, the licensee announced the completion of its independent investigation into management response to allegations that a shift supervisor at TMI-2 slept while on shift. The report was received by GPU Nuclear (GPUN) Corporation and forwarded to the Nuclear Regulatory Commission. The independent investigation was conducted for GPUN by Edwin H. Stier, former director of the New Jersey Division of Criminal Justice. In November 1987, Mr. Stier confirmed that the shift supervisor slept on a number of occasions or otherwise was inattentive to his job. Subsequently, the individual was fired.

In the second phase of the investigation, Mr. Stier was critical of site management's handling of the allegations concerning the behavior of the shift supervisor. As a result of the completion of the investigation, the licensee took a number of disciplinary actions affecting TMI-2 site management. These actions included a dismissal, reassignments to positions not involving supervision of licensed operators at TMI-2, and formal reprimands.

Site inspectors will review the qualifications of the individuals chosen by the licensee to replace those affected by the disciplinary actions. This will be done to verify that the individuals qualifications are in accordance with Technical Specifications (TS) 6.3. The results of this review will be documented in a future NRC inspection report (Unresolved Item 320/88-12-01).

4.0 Licensee Action on NRC Staff Circulars/Information Notices

Prior to 1982, the NRC staff routinely informed licensees of generic information and/or operating experience feedback using the "circular" system. The licensee did not have to respond to a circular, but NRC staff expected licensee to review this information for applicability and to take appropriate corrective actions.

In 1982, NRC staff started to use two systems to pass on such information to licensees. One was Generic Letters issued by the Office of Nuclear Reactor Regulation (NRR) and the other was Information Notices issued by the Office of Inspection and Enforcement (IE). (The functions of IE have been absorbed into other NRC offices, such as NRR, for the issuance of Information Notices.)

When the circular system was in effect, the regional inspectors placed the circulars in an internal Region I "open items tracking system" (OI list) for possible future inspection depending on the type of inspection. It was never intended that all circulars be formally closed in inspection reports. This is currently unrealistic considering the number of Information Notices issued per year (close to 100). Accordingly, no Information Notices were specifically listed on the OI list for Unit 2, but these were residual "open" circulars listed on this system.

Past inspections in the area confirmed: (1) many circulars (Information Notices) were not applicable to TMI-2 because of its unique conditions; (2) the licensee had a review process for determining current applicability for immediate action in distinction to deferred action because of applicability for an operating unit; and, (3) licensee decisions of an immediate or deferred corrective action for selected circulars were acceptable.

During this inspection, the inspector reaffirmed the above-noted conclusions. For example, Circular No. 79-05 dealt with equipment environmental qualification for design basis events. This was appropriately deferred for action because environmental qualification requirements were applicable to only an operating reactor. However, Circular No. 75-12 on emergency diesel generator (EDG) problems were reviewed for applicability when the EDG's were required to be operable (Licensee Action Item (LAI) No. 2-80-039).

Based on the review criteria stated above, the following circulars, as listed on the Region I OI list for TMI-2, are considered administratively closed: 77-14; 78-16; 79-02, 04, 05, 10, 12, 17, 19, 20, 23; 80-01, 03, 04, 05, 10, 11, 12, 22, 23; 81-01, 05, 06, and 08.

As a part of the routine inspection program, Region I will continue to review this area for generic information applicable to current TMI-2 conditions.

5.0 Exit Meeting

The inspectors discussed the inspection scope and findings with licensee management at a final exit interview conducted August 5, 1988. Senior licensee personnel attending the final exit meeting were noted in Section 1.3.

The inspection results, as discussed at the meeting, are summarized in the cover page of the inspection report. Licensee representatives indicated that none of the subjects discussed contained proprietary or safeguards information.