U. S. NUCLEAR REGULATORY COMMISSION

Region I

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50320-820726

Report No. 50-320/82-11

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: August 8 - September 11, 1982

Inspectors:

R. Conte, Senior Resident Inspector (TMI-1) — date signed 10/8/82

T. Moslak, Radiation Specialist — date signed 10/4/82

B. O'Neill, Radiation Specialist — date signed 10/4/82

L. Thonus, Resident Inspector (TMI-2) — date signed 10/4/82

J. Wiebe, Senior Resident Inspector (TMI-2) — date signed 10/8/82

Approved by:

A. Fasano, Chief, Three Mile Island Section
Projects Branch No. 2 — date signed 10/9/82

Inspection Summary:

Inspection conducted on August 8 - September 11, 1982 (Inspection Report Number 50-320/82-11)
Areas Inspected: Routine safety inspection conducted by site inspectors of routine plant operations; routine health physics and environmental areas; reactor building entries; contamination control corridor; radioactive material shipments; and licensee event reports. The inspection involved 78 inspector-hours.
Results: No violations were identified.

DETAILS

1. Persons Contacted

General Public Utilities (GPU) Nuclear Corporation

*S. Chaplin, Licensing Engineer
J. Flanigan, Radiological Engineering Manager
*J. Garrison, Quality Assurance (QA) Auditor
*M. Herlihy, Manager, Safety Review Group
*J. Hildebrand, Director, Radiological Controls
*G. Kunder, Acting Technical Specification Compliance Supervisor
*D. LeQuia, Operations QA Monitor
P. Newkirk, Deputy Manager, Radiological Field Operations
*J. Renshaw, Manager, Radiological Field Operations
*P. Ruhter, Manager, Radiological Engineering

Other licensee personnel were also interviewed.

*denotes those present at the exit interview.

2. Routine Plant Operations

Inspections of the facility were conducted to assess compliance with general operating requirements of TS § 8.1 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.

Unannounced inspections of the control room during regular and back shift hours were conducted. Selected sections of the shift foreman's log and control room operator's log were reviewed for the period August 8 - September 11, 1982. Selected sections of other control room daily logs were reviewed for the period from midnight of the day of review to the time of review. Inspections of areas outside the control room also occurred. Selected licensee planning meetings were observed.

No violations were identified.

3. Routine Health Physics and Environmental Review

a. Plant Tours

The NRC site radiation specialists completed routine plant inspection tours. These inspections included all control points and selected radiologically controlled areas. Observations included:

-- 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.

4. 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.

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

Entries 80 through 92 were conducted during this inspection period.

Entry 80 conducted Thursday, August 12, 1982
(third Quick Look)
Entry 81 conducted Friday, August 13, 1982
Entry 82 conducted Monday, August 16, 1982
Entry 83 conducted Wednesday, August 18, 1982
Entry 84 conducted Friday, August 20, 1982
Entry 85 conducted Monday, August 23, 1982
Entry 86 conducted Wednesday, August 25, 1982
Entry 87 conducted Friday, August 27, 1982
(Completed uncoupling of the leadscrews from 58 control rods, and the eight axial power shaping rods. Three control rod leadscrews could not be uncoupled.)
Entry 88 conducted Monday, August 30, 1982
Entry 89 conducted Wednesday, September 1, 1982
Entry 90 conducted Friday, September 3, 1982
(Continued polar crane damage assessment, and preparations for the "Phase II Decontamination Program." The "Phase II Decontamination Program" is scheduled to start in September, using decontamination techniques similar to those during the gross decontamination experiment. The proposed program will include decontamination of the reactor building dome, the polar crane, and inside the "D" rings. The long range program is expected to involve a 52 week period of 3 reactor building entries per week, 1,800 man-hours in containment, and spend 180 to 550 man-rem.)
Entry 91 conducted Wednesday, September 8, 1982
Entry 92 conducted Friday, September 10, 1982

c. A special review of the administrative and engineering controls for the contamination control corridor, used during personnel access to and egress from the Reactor Building, was also conducted (details, paragraph 5).

5. Administrative and Engineering Controls for the Contamination Control Corridor

a. Background

On August 23, 1982, the licensee removed the requirement to have utility workers wear respirators in the contamination control corridor (CCC). As a result of this decision, several concerns were presented by utility workers to the NRC with regard to working in the CCC without wearing respirators. Concerns were raised regarding potential high airborne radioactivity in the CCC area. The inspector examined

the licensee's administrative and engineering radiological controls to control the spread of contamination and minimize airborne radioactivity.

The CCC is an L-shaped plastic tent structure located in the anteroom (305' elevation) adjacent to the Reactor Building personnel hatch. Its purpose is to control the spread of contamination as personnel and equipment exit the Reactor Building. The CCC consists of two zones. Zone 1 is the first area that exiting Reactor Building personnel enter when leaving the airlock. A utility worker is stationed in Zone 1 to assist personnel in removal of some of their equipment. Specifically, a utility worker is scheduled for a two hour shift in the CCC. He is to assist exiting personnel in removing plastic anti-C clothing, two-way radios, breathing zone air samplers (BZAs), digital and self-reading dosimeters, and various pieces of tape. Upon removal of this equipment, Reactor Building personnel then enter Zone 2 of the CCC where they finish removing their apparel unaided by a utility worker.

Zone 1 is equipped with a ventilation system and an in-place, continuous airborne monitoring system (AMS-3).

Prior to lifting the respirator requirement for the utility worker, the licensee collected data on the CCC airborne concentrations of radioactive materials over a three month period. The data was obtained from BZAs worn by the utility workers while performing their assignment in the CCC, periodic high volume air samples taken during undressing operations, and analysis of the filter from the continuous air sampler. Assessments of the airborne concentrations were found to be such that an individual working in the CCC would not receive an intake of 2 MPC-hours in 1 day or an intake of 10 MPC-hours in 1 week. The licensee requires utility workers to wear BZAs in the CCC to verify the airborne concentrations to which the individual worker is exposed.

In presenting their concerns to the NRC, utility workers stated that they were concerned that contamination on the exiting personnel's anti-Cs and equipment would become suspended in the air and subsequently inhaled.

b. Findings

The inspection consisted of examinations of the licensee's airborne monitoring data and procedures, interviews with personnel, independent measurements made by the inspector, and observations by the inspector.

Based upon this review of the licensee's analytical data, verification of licensee data by independent measurements, and examination of the administrative and engineering controls, the inspector concluded that utility workers are not being exposed to airborne concentrations of radioactive materials in the CCC that exceed 2 MPC-hours per day

or 10 MPC-hours per week which is within regulatory limits of 10 CFR 20. During the review the inspector discussed with the licensee the following areas.

(1) The licensee's RWP for individuals working in the CCC requires wearing BZAs. The inspector identified that the licensee had not established a procedure for placing BZAs on utility workers. In some instances Radiological Control Technicians place the BZAs on the worker and in other instances the utility worker places it on himself. As a result, in a limited number of measurements, the BZA did not always provide the optimum data representative of the inhaled airborne concentration. Specifically in one situation reported to the inspector, a worker had positioned a BZA on his chest, such that the placement was nearer to the contaminated material than the workers breathing zone. This could result in an overly conservative measurement of the airborne concentration. In a second situation, a Radiological Controls technician placed the BZA on the upper back of a worker. Such placement could lead to a less conservative measurement. The inspector discussed this finding with licensee representatives. As a result of this discussion, the licensee committed to establish a procedure for placing BZAs on workers.

(2) The inspector examined the CCC (temporary) ventilation system. The system is designed to establish an air flow path, drawing air from the anteroom through the CCC then exhausting it to the Auxiliary Building ventilation system. Since the licensee had measured airborne concentrations in the CCC with the ventilating system in operation, proper operability of the system should be ensured prior to and during occupancy of the CCC. As a result of examination of procedures and discussions with licensee representatives, the inspector determined that the licensee had not established procedural controls to insure the system is operating as designed. The inspector discussed this finding with licensee representatives and the licensee committed to establish a procedure for the CCC ventilation system.

(3) During interviews with licensee representatives, the inspector learned that the AMS-3 which was monitoring CCC airborne concentrations had alarmed on August 27, 1982; August 30, 1982; and September 10, 1982. Formal documentation of these alarm events was not available in either the Radiological Controls Department logs and records or the Control Room logs. Furthermore, no radiological controls procedure had been established delineating what information should be recorded in the Radiological Controls log or what information should be communicated to shift relief personnel. The inspector discussed these findings with licensee representatives. As a result of these discussions, the licensee committed to formally document all AMS-3 alarms and to establish procedures for maintaining Radiological Controls Department logs and for conducting a shift turnover.

The causes of the AMS-3 alarming on the aforementioned dates is under investigation by the licensee. Preliminary indications based on analysis of the AMS-3 filter paper by gamma and beta spectroscopy show that the alarms were not initiated by long-lived radioactive material deposited on the filter paper, and therefore the alarms were not caused by elevated concentrations of re-suspended radioactive material in the CCC.

(4) The inspector reviewed the licensee's documents that address personnel response to AMS-3 alarms. According to the TMI-2 Radiation Protection Plan, personnel are to notify Radiological Controls personnel of alarming radiation protection equipment. Per Radiological Controls Procedure 4104, "Air Sampling Procedure," Revision 2, effective September 1, 1982, the Radiological Controls technician will then (1) notify the cognizant Radiological Controls Foreman immediately to consider control actions and additional sampling requirements, (2) remove the constant monitoring unit filter paper and have it analyzed, and (3) replace the constant air monitoring unit filter with a new filter. The inspector determined that these documents do not provide specific guidance to non-radiological controls personnel as to what their actions are following notification of the Radiological Controls Department. Presently, utility workers receive instructions from radiological controls personnel. Through interviews with licensee representatives the inspector determined that such instructions had been inconsistent and had caused confusion to some of the utility workers. The inspector discussed this finding with licensee representatives. As a result of these discussions, the licensee committed to improve the guidance given to workers regarding the actions to take when an AMS-3 alarms.

The NRC will continue to review this area pending completion of the necessary improvements as noted above in the administrative and controls for the CCC (320/82-11-01).

Because of renewed worker concerns presented to the NRC on September 10, 1982, a further inspection of CCC activities was scheduled during Reactor Building entry 93 on Wednesday, September 15, 1982. The results of that review will be reported during the next inspection period.

6. Radioactive Material Shipments

a. The NRC site radiation specialists inspected all radioactive material shipments during the inspection period to verify the items listed below.

-- Licensee had complied with approved packaging and shipping procedures.

-- Licensee had prepared shipping papers, which certified that the radioactive materials were properly classified, described, packaged, and marked for transport.

-- Licensee had applied warning labels to all packages and placarded vehicles.

-- Licensee controlled the radioactive contamination and dose rates below the regulatory limits.

Inspector review of this area consisted of: examination of shipping papers, procedures, packages, and vehicles; and performance of radiation and contamination surveys of each shipment.

During this period, 13 radioactive material shipments were made by the licensee.

No violations were identified.

b. EPICOR II Prefilter Shipments

On August 17, 1982, the first of 49 EPICOR II prefilters (PF-3) was shipped from TMI to the Battelle Columbus Laboratories (BCL) in West Jefferson, Ohio. This 50 cubic foot ion exchange vessel was used to process accident generated water from the TMI-2 Auxiliary Building in 1979 and contained approximately 1,800 curies of radioactive material. On August 25, 1982, the second prefilter (PF-1) was shipped from TMI to the Idaho National Engineering Laboratory (INEL) in Scoville, Idaho. DOE also took possession of this waste onsite.

No violations were identified.

7. Licensee Event Reports

The inspector reviewed Licensee Event Reports (LERs) required to be submitted in accordance with Technical Specifications (TS) 6.9.1.8 and 6.9.1.9 (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 these events was completed to determine generic applicability, need for additional site verification, and the necessity for additional NRC management review.

The below listed LERs were reviewed.

-- LER 82-24/03L-0, dated August 9, 1982, Fuel Handling Building ventilation trip

-- LER 82-25/03L-0, dated August 9, 1982, Personnel airlock to Reactor Building failed leakage test

-- LER 82-27, 03L-0, dated August 25, 1982, Emergency diesel generator DF-X-1A inoperable

-- LER 82-32/03L-0, dated August 25, 1982, Auxiliary Building ventilation exhaust flow below Technical Specification limit

No violations were identified.

8. Exit Interview

On September 15, 1982, a meeting was held with licensee representatives (denoted in paragraph 1) to discuss the inspection scope and findings. Other NRC personnel, other than the reporting inspectors, present at the exit interview are noted below.

-- L. Barrett, Deputy Program Director, TMI Program Office

-- R. Bellamy, Chief, Technical Support Section, TMI Program Office

-- A. Fasano, Chief, Three Mile Island Section