

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-289/92-12

Docket No. 50-289

License No. DPR-50

Licensee: GPU Nuclear Corporation
P.O. Box 480
Middletown, Pennsylvania 17057-0191

Facility Name: Three Mile Island Nuclear Station, Unit 1

Inspection At: Middletown, Pennsylvania

Inspection Conducted: May 19-20, 1992

Inspectors:

Jason C. Jang
Jason C. Jang, Sr. Radiation Specialist
Effluents Radiation Protection Section (ERPS),
Facilities Radiological Safety and Safeguards
Branch (FRS&SB)

5-28-92
date

James J. Kottan
James J. Kottan, Sr. Laboratory Specialist,
ERPS, FRS&SB

5-28-92
date

Approved By:

Robert J. Bores
Robert J. Bores, Chief, ERPS, FRS&SB,
Division of Radiation Safety and Safeguards

5-28-92
date

Areas Inspected: Announced followup inspection for two unresolved items in the area of effluent radiation monitoring systems (50-298/91-15-01 and 50-289/91-15-02).

Results: Within the areas inspected, the licensee's effort to resolve two items were noteworthy. No safety concerns or violations of regulatory requirements were observed.

DETAILS

1.0 Individuals Contacted

1.1 Licensee Personnel

- * M. Benson, EP&I Engineer, Technical Function
- * J. Dullinger, I&C Engineer
- * D. Hassler, Licensing Engineer
- * V. Orlandi, Lead I&C Engineer
- * S. Williams, Senior Radiological Engineer

1.2 NRC Personnel

- * F. Young, Senior Resident Inspector
- * Denotes those present at the exit interview on May 20, 1992.

2.0 Purpose

The purpose of this inspection was to review the licensee's corrective actions on two unresolved items (50-289/91-15-01 and 50-289/91-15-02) and the adequacy of calibration techniques for the effluent radiation monitoring systems (RMS).

3.0 Review of Unresolved Items

3.1 (Closed) Unresolved Item No. 1 (50-289/91-15-01)

Sub-item 1. The licensee was to provide definitions of Channel Check, Source Check, Channel Calibration, and Channel Test as listed and provide a description of activities to satisfy these requirements. Actual results obtained by the licensee during performance of those activities to satisfy these defined requirements were also requested.

Sub-item 2. The licensee's data to support the RMS inherent stability and a thorough initial primary calibration for performed single-point calibrations to satisfy the NRR Branch Technical Position for RMS calibrations.

The licensee provided the requested information concerning Sub-item 1 to the NRC on September 30, 1991. This information was evaluated, found to be appropriate and was accepted. This sub-item is closed.

The licensee also responded to Sub-item 2 on September 30, 1991. However, the response did not provide a complete package to facilitate review of this sub-item. During this inspection, the inspector reviewed all necessary documents, including primary calibration results for RM-A5 and RM-A15 (Condenser Vent Noble Gas Monitors). Based on this review, the inspector determined that the licensee had completed actions to demonstrate the inherent stability of the RMS (See Section 4.0 of this inspection report for details). This sub-item is closed.

3.2 (Closed) Unresolved Item No. 2 (50-289/91-15-02)

Validation of the sensitivities [counts per minute (CPM)/ $\mu\text{Ci/cc}$] for the following liquid and gaseous effluent radiation monitors.

- o RM-L6 Liquid Radwaste Effluent Monitor
- o RM-L7 Station Discharge Liquid Monitor
- o RM-L10 Turbine Building Sump
- o RM-I 12 IWTS/IWFS Discharge Line Monitor
- o RM-A4 Fuel Handling Building Exhaust
- o RM-A6 Auxiliary Building Exhaust
- o RM-A8 Station Vent Exhaust
- o RM-A5 Condenser Vent Noble Gas Monitor
- o RM-A15 Condenser Vent Noble Gas Monitor
- o RM-A7 Waste Gas Holdup System Noble Gas Monitor
- o RM-A9 Containment Purge Noble Gas Monitor
- o RM-A14 ESF Fuel Handling Building Exhaust

During review of the primary calibration records supplied by the vendor, the inspector noted that the licensee's vendor performed secondary calibrations using only one solid source. As a result, the licensee was not able to validate the primary sensitivity during subsequent calibrations. Although solid sources of at least three strength are normally needed to determine the RMS sensitivity, the licensee validated the sensitivities of the above RMS by comparing laboratory measurement results ($\mu\text{Ci/cc}$) and RMS monitoring results (CPM). The inspector reviewed these comparisons and determined that the results were acceptable. This item is closed.

4.0 Review of the Primary Calibration Results

The licensee's vendor performed the primary calibration for RM-A5 and RM-A15 in 1991. During the review of primary calibration procedures and results, the inspector noted that the calibration techniques and results were excellent. The inspector also noted that the vendor used Xe-133 gas (traceable to National Institute of Standards and Technology) to determine the primary sensitivities for these RMS. The vendor performed the secondary calibration simultaneously using three solid sources (Cs-137) of various strengths. The licensee will now be able to validate the primary sensitivity during subsequent calibrations. The inspector verified the primary sensitivities using a statistical method (linear regression) independently and the results were in excellent agreement.

The inspector noted that the licensee's vendor will perform the primary calibration for RM-A9 and RM-L6 during the later part of this year. The inspector stated that the primary calibration results will be reviewed during a subsequent inspection.

5.0 Review of RMS Calibration Procedures

The I&C Department has responsibility to perform electronic and radiological calibrations. The inspector reviewed the following upgraded RMS calibration procedures (draft procedures) to determine the technical adequacy.

- o 1302-3.1A, RM-A4, 6, 7, 8, and 9 Gas Channel Calibration
- o 1302-3.1B, RM-L6 and RM-L7 Liquid Monitor Calibration

The above procedures appeared to be thorough and contained the necessary information to evaluate the stability of effluent RMS. However, these procedures did not contain the sensitivity evaluation because these procedures were written for an I&C technician. The final evaluation, such as validating the primary sensitivity, will be done by a system engineer who has good knowledge in the area of the radiological calibration for effluent RMS. The licensee stated that this evaluation will be done within a few weeks after the calibration is performed by the I&C technician. During discussions with the licensee, the inspector noted that representatives of Radiological Engineering and Technical Function Departments were involved in preparing these draft procedures. The inspector also noted that the I&C Department now has better communications channels with the Radiological Engineering and Technical Function Departments.

Based on the above procedure review, the inspector determined the licensee will have good RMS calibration procedures. These draft procedures will be reviewed and approved by the licensee as required by the Technical Specifications in the near future. The inspector stated that the final procedures and the technical evaluation process by the system engineer will be reviewed during a subsequent inspection.

6.0 Exit Interview

The inspector met the licensee representatives (denoted in Section 1.1) at the conclusion of the inspection on May 20, 1992. The inspector summarized the purpose, scope, and findings of the inspection.