

REVIEWED BY:

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USNRC

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(ORGANIZATION)

(DATE)

U. S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 50-289/90-09

Docket No. 50-289

License No. DPR-50

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

Facility Name: Three Mile Island Unit 1

Inspection At: Middletown Pennsylvania

Inspection Conducted: April 4-6, 1990

Inspectors: *Carl H. Woodard*  
C. H. Woodard, Reactor Engineer, PSS/EB

05/07/90  
date

Approved by: for *Ralph M. Anderson*  
C. J. Anderson, Chief, Plant Systems  
Section, EB, DRS

5/8/90  
date

Inspection Summary:

Inspection on April 4-6, 1990 (Inspection Report No. 50-289/90-09)

Areas Inspected: Routine announced inspection to address the licensee's actions taken to address unresolved items identified during previous NRC Inspection 89-13. These items involved questions of operability, testing and maintenance of motor operated valves and concerns for maintaining the quality of the emergency diesel generators fuel oil.

Results: Of the areas inspected, no violations were identified.

## DETAILS

### 1.0 Persons Contacted

#### 1.1 General Public Utilities Nuclear (GPUN) Corporation

E. Fuhrer, Manager Plant Chemistry  
\*D. Hassler, Licensing Engineer  
\*M. Knight, Licensing Engineer  
C. Kaylor, Manager Planning  
\*L. Lucas, Chemist  
\*R. Maag, Manager Plant Material  
\*M. Moore, Materials Engineer  
\*J. Stacy, Manager Plant Security  
\*R. Wells, Licensing Engineer  
\*R. Zimmerman, Plant Engineer

#### 1.2 Nuclear Regulatory Commission (NRC)

F. Young  
\*D. Johnson  
\*R. Brady

\*Denotes those present at the exit meeting

### 2.0 Licensee's Actions on Previously Identified Items

#### 2.1 (Closed) Unresolved Item 50-289/89-13-01, Controls For Motor Operated Valve (MOV) Torque Switch Settings

During inspection 89-13, the NRC inspector found that the licensee relies on previous test data to determine the required torque switch settings. These results were not documented in a controlled document to ensure that the correct setpoints are maintained. The setpoints and the corresponding thrust values were retained in uncontrolled files located in the maintenance shop. As a consequence, this situation could lead to the use of obsolete setpoint values during maintenance.

During this inspection, the inspector reviewed the corrective actions taken by the licensee to resolve this item. The inspector reviewed the steps, interfaces and controls used by maintenance in performing work on an MOV which could affect setpoints. The inspector also discussed with engineering and planning personnel a current Work Request (#756501) which involves the installation of new Belleville spring packs and MOV testing. The inspector found that the licensee has established control of the MOV setpoints by including the maintenance of these MOVs in their GMS-2 computerized maintenance program. The setpoints were established and confirmed by cognizant engineering personnel and entered into this program. By being a part of the GMS-2 Program, MOV input data including setpoints are



controlled. Any changes require approval by designated personnel with GMS-2 access capability. Output in the form of read-out and print-out are available to maintenance, planning and others who have the GMS-2 terminals. Therefore, when a MOV work request package is generated, the GMS-2 system provides the current MOV data including setpoints.

The inspector considered the licensee's corrective actions adequate. This item is closed.

2.2 (Open) Unresolved Item No. 50-289/89-13-02 Demonstration of MOV Operability

During inspection 89-13, the NRC inspector determined that testing of the MOVs under conditions of maximum differential pressure or certain other testing means with appropriate justification is required to demonstrate MOV operability. In addition, MOV operability must be assured during conditions of degraded grid voltage.

The inspector determined that the licensee was not ready to address close out of MOV operability under conditions of maximum differential pressure. Regarding operability under conditions of degraded grid voltage, the licensee had completed calculations to demonstrate operability with an assumed minimum MOV terminal voltage of 75% of nominal. This calculation was considered by the licensee to be conservative and was considered adequate to demonstrate operability. However, a later calculation of the effects of degraded grid voltage which reflected actual MOV terminal voltage had not been factored into the MOV operability report. The above items remain open pending the licensee's completion of their evaluation of these issues.

2.3 (Closed) Unresolved Item No. 50-289/89-13-03, Retesting Guidelines for Motor Operated Valves (MOV)

During inspection 89-13, the inspectors observed that licensee procedures do not identify the circumstances which prompt the retesting of MOVs. Certain corrective and preventive maintenance activities can influence the as-left conditions of the MOV settings. Previously, the cognizant engineers determined the retesting should be based on the MOV maintenance performed without documented guidelines.

The inspector determined that the licensee has now established "MOV Retest Criteria" by Memorandum 3330-89-0047 LAI-89-9134 dated July 25, 1989. The following activities are included in the criteria which require retest:

- Repacking of the valve
- Replacement of the torque switch
- Any major work on the valve itself
- Replacement of the worm gear
- Replacement or readjustment of the spring pack or spring cartridge cap.

The inspector found that the following MOV maintenance procedures have been revised to incorporate the retest criteria.

- 1420-LTQ-1, Rev 13 - Troubleshooting Limitorque Valve Operators and Control Circuits, Removal and Replacement of Limitorque Valve Operators
- 1420-LTQ-2, Rev 11 - Limitorque Operator, Limit Switch and Torque Switch Adjustments
- 1420-LTQ-8, Rev 2 - Limitorque Valve Operator Disassembly and Reassembly
- E13, Rev. 19 - Limitorque Valves

The inspector considered the licensee's corrective actions adequate. This item is closed.

2.4 (Closed) Unresolved Item No. 50-289/89-13-05, Emergency Diesel Generator Fuel Oil Concerns

The inspector questioned replenishing EDG fuel oil by the use of the local truck fill connection for fuel storage tank DF-T-1. The concern was that the licensee's analysis of new fuel takes approximately two weeks. Fuel deficiencies could lead to the common mode failure of the EDG units.

The licensee addressed this item in Diesel Generator Operating Procedure 1107-3, Revision 50. It clarifies that new fuel is not normally delivered into EDG storage tank DF-T-1, but, into the 50,000 gallon buffer storage tank FO-T-1. Fuel in this tank is routinely analyzed each week and analysis is made for all new fuel within two weeks. By serving as a buffer storage tank, tank FO-T-1 provides reasonable assurance of proper make up fuel to EDG storage tank DF-T-1.

Procedure 1107-3 provides an alternate method for filling the tank using a local fill connection. Also, a precaution statement is added in the procedure which requires analysis of the fuel oil prior to filling the tank.



Since fuel oil degrades with time and is subject to contamination from various sources, it is important to establish a program which ensures the continuing quality of stored EDG fuel oil. The inspector questioned the fact that the fuel oil stored in the EDG fuel storage tank DF-T-1 and in the EDG day tanks is not periodically sampled to ensure quality. The licensee has addressed this issue by performing initial sampling and analysis of fuel in these tanks, by taking appropriate actions to remove contaminants, and by implementing Operations Procedure OPS-S393 to periodically sample and analyze fuel in EDG storage tank DF-T-1. Also, periodic sampling and analysis of the day tanks are done in accordance with Procedure 1301-8.2. The inspector confirmed that the licensee has evaluated the need to use antioxidant and biocide fuel additives in the diesel fuel and the need for the periodic recirculation/filtration of the stored EDG fuel to remove particulates. Recirculation/filtration was performed in December 1989. Fuel additives will not be used at this time. The inspector had no further questions in these areas.

This item is closed.

### 3.0 Emergency Diesel Generator Control Voltage Concern

The inspector noted that there may be detrimental effects from the loss of 125 Vdc control voltage upon EDG operation or possible equipment damage under certain modes of operation of the EDG units. The licensee has completed an evaluation of the effects of loss of the 125 Vdc control voltage and concludes that there are no detrimental effects from this loss and there is little probability of equipment damage. As a consequence, no changes are contemplated at the present time. The inspector had no further questions in this area.

### 4.0 Emergency Diesel Generators On-site Fuel Oil Supply Adequacy

NRC Information Notice (IN) 89-50 alerted licensees to the potential existence of an inadequate Emergency Diesel Generator (EDG) fuel supply to meet the FSAR and Technical Specification (TS) requirements. The IN also noted that in several plants, there were discrepancies between the FSAR and TS basis for the amount of fuel oil required to be available for specific operational requirements for the EDG units.

The inspector reviewed the licensee's evaluation which was made to address the concerns of IN 89-50. This evaluation is included in the licensee's internal Memorandum LAI-89-9123, dated September 26, 1989 entitled "Inadequate EDG Fuel Supply." The inspector determined from the licensee's evaluation that there is no discrepancy between the FSAR and Technical Specification requirements. The TMI-1 FSAR states that, "sufficient fuel is stored to allow one unit to supply post-accident power requirements for seven days" and the TMI-1 TS requires that the "engineered safeguards diesel generators are operable and at least 25,000 gallons of fuel oil are available in the storage tank." For these two

documents to be consistent, at least 25,000 gallons of fuel oil are required to allow one EDG unit to supply post-accident power requirements for seven days.

The licensee's evaluation includes the worst case seven day diesel generator loading analysis. It also assumes the highest EDG fuel consumption rate. The evaluation shows a seven day fuel consumption of 22,651 gallons which is approximately ten percent less than the 25,000 gallon minimum fuel oil requirements for the DF-T-1 30,000 gallon fuel storage tank.

The inspector had no further questions regarding this issue.

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#### 6.0 Exit Meeting

Licensee management was informed of the purpose and scope of the inspection at the entrance interview. The findings of the inspection were periodically discussed and were summarized at the exit meeting on April 6, 1990.

Attendees at the exit meeting are listed in Section 1.0 of this report. At no time during the inspection was written material provided to the licensee by the inspector. The licensee did not indicate that the inspection involved any proprietary information.