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92-14

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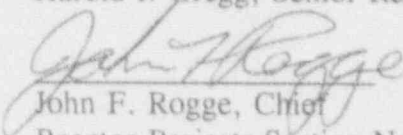
Licensee: GPU Nuclear Corporation  
P.O. Box 480  
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Facility: Three Mile Island Station, Units 1 and 2

Location: Middletown, Pennsylvania

Inspection Period: October 27, 1992 - December 7, 1992

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Inspection Summary

The NRC Staff conducted safety inspections of Unit 1 power operations and Unit 2 cleanup activities. The inspectors reviewed plant operations, maintenance, radiological controls, security, and engineering and technical support activities as they related to plant safety.

Results: An overview of inspection results are in the executive summary.

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## EXECUTIVE SUMMARY

Three Mile Island Nuclear Power Station  
Report Nos. 50-289/92-20 & 50-320/92-14

### Plant Operations

The licensee conducted overall plant operations in a safe and conservative manner. The station blackout diesel was inoperable for approximately one month due to a mispositioned cooling water valve. Although the diesel is not safety related equipment, this incident reflects a weakness in maintaining control of the status of important plant components.

The Unit 2 accident generated water evaporator continues to operate and approximately 1,299,000 gallons of AGW have been vaporized to the atmosphere at the close of the inspection period.

### Radiological Controls

During the routine auxiliary building tours, the inspector paid particular attention to ensure radiological surveys were current and that the proper warning signs were posted. The inspector noted no discrepancies and concluded that overall radiological controls were good.

### Maintenance and Surveillance

The inspector found two unsupported 30 gallon bottles of liquid petroleum gas improperly stored within 15 feet of the borated water storage tank. The licensee changed the maintenance procedure which controls hot work permits to require cognizant personnel to review the potential effect of this fire/missile hazard on safety related equipment.

A review of past Plant Review Group meeting minutes determined that the licensee missed a core flood tank boron sampling surveillance and did not report this to the NRC as required. The Plant Review Group's understanding and application of the Licensee Event Report regulations were found to be incorrect. This failure to report is cited as a violation.

The inspector noted that the licensee has been changing the preventive maintenance (PM) frequencies to correspond with system maintenance outages without fully evaluating and documenting a technical basis why the change is acceptable.

The reactor building atmospheric monitor was rendered inoperable due the failure to properly return the monitor to service during the surveillance procedure restoration. The licensee's corrective actions were comprehensive and the incident was reported as required. This incident is characterized as a non-cited violation.

### Safety Assessment and Quality Verification

The inspector attended General Office Review Board meetings and found that the board's review of safety issues was comprehensive and demonstrated the proper safety perspective.

### Engineering and Technical Support

The inspector found that the modification packages for the spent fuel pool re-rack modification were comprehensive and management involvement in the re-rack activities was evident.

The inspector closed an open item concerning whether the leak rates through DH-V-22B, CF-V-4B, and CF-V-5B, as evidenced by core flood tank level decrease, were within the technical specification required band. Subsequent surveillance testing was satisfactory.

Repair of the heater drain pump discharge check valve through-wall leak was well engineered and performed.

### Security

During the period the secondary alarm station was unavailable, the inspector verified that the licensee implemented appropriate compensatory measures.



## DETAILS

### 1.0 SUMMARY OF FACILITY ACTIVITIES

#### 1.1 Licensee Activities

Unit 1 remained at 100% power throughout the inspection period except for a three-day period beginning November 20, 1992, when power was reduced to 50% to remove clam shells from the main condenser.

The Accident Generated Water (AGW) evaporator resumed vaporizing water to the atmosphere on November 25, 1992. The evaporator had been operating in a decoupled mode since June 11, 1992, where the condensate produced in the first part of the AGW system was sent to a storage tank rather than be vaporized to the atmosphere. At the close of the inspection period approximately 1,299,000 gallons had been vaporized to the atmosphere overall to date.

#### 1.2 NRC Staff Activities

This inspection assessed the adequacy of licensee activities for reactor safety, safeguards, and radiation protection. The inspectors made this assessment by reviewing information on a sampling basis. The inspectors obtained information through actual observation of licensee activities, interviews with licensee personnel, and documentation reviews.

The inspectors observed licensee activities during both normal and backshift hours: 46 hours of direct inspection were conducted on backshift and 15.5 hours were conducted on deep backshift. The times of backshift hours were adjusted weekly to assure randomness.

### 2.0 PLANT OPERATIONS (71707)

#### 2.1 Operational Safety Verification

The inspectors observed overall plant operation and verified that the licensee operated the plant safely and in accordance with procedures and regulatory requirements. The inspectors conducted regular tours of the following plant areas:

- |                             |                             |
|-----------------------------|-----------------------------|
| --Control Room              | --Auxiliary Building        |
| --Switch Gear Areas         | --Turbine Building          |
| --Access Control Points     | --Intake Structure          |
| --Protected Area Fence Line | --Intermediate Building     |
| --Fuel Handling Building    | --Diesel Generator Building |

The inspectors observed plant conditions through control room tours to verify proper alignment of engineered safety features; to verify that operator response to alarm conditions was in accordance with plant operating procedures; to verify compliance with Technical Specifications, including implementation of appropriate action statements for equipment out of service; and to review logs and records to determine if entries were accurate and identified equipment status or deficiencies. These records included operating logs, turnover sheets, and system safety tags.

The inspector conducted detailed walkdowns of accessible areas to inspect major components and systems for leakage, proper alignment, proper lubrication, proper cooling water supply, and any general condition that might prevent fulfillment of their safety function. The inspector observed plant housekeeping controls including control and storage of flammable material and other potential safety hazards.

On November 23, 1992, the inspector noted four fire extinguishers in the station blackout diesel building that did not receive the required monthly inspection. The licensee indicated that the problem had also been noted during a Fire Protection Engineer's tour. The licensee stated that the cause of the missed inspections was the poor transfer of the responsibility for the extinguishers from Unit 2 to Unit 1. The safety significance of this incident is considered to be minor.

The inspector found that shift turnovers were comprehensive and accurate, and adequately reflected plant activities and status. Control room operators effectively monitored plant operating conditions and made necessary adjustments. Housekeeping was good. The inspector concluded that the licensee conducted overall plant operations in a safe and conservative manner.

## **2.2 Station Blackout Diesel Inoperable**

On November 15, 1992, the licensee found FS-V-652, the station blackout (SBO) diesel cooling water outlet valve, closed rendering the diesel inoperable. The SBO diesel air, lubricating oil, and jacket water heat exchangers use the fire service system for heat removal. Even though FS-V-652 maintained the fire service system designator (FS) the licensee downgraded the quality classification of the valve to regulatory required and the valve is considered an SBO diesel valve. The valve was found closed by an observant auxiliary operator. Operating Procedure 1107-9, "SBO Diesel Generator," requires the valve to be open. The licensee performed a valve lineup of all SBO diesel valves and did not find any other valve out of position.

The licensee was unable to determine when the valve was closed but suspects it was closed on or about November 7, 1992, when fire service system valves were manipulated to locate a small fire service system leak. Operations personnel involved in the troubleshooting do not recall shutting FS-V-652. There were several log entries to document the manipulation of fire service system valves but FS-V-652 was not mentioned. The diesel was last operated during its quarterly surveillance on September 12, 1992. The SBO diesel cooling water system was flushed on October 6, 1992, indicating the valve was open on this date.

Administrative Procedure (AP) 1029, "Conduct of Operations," states that operation of equipment or systems shall only be accomplished with the knowledge and consent of the Shift Supervisor or Shift Foreman. AP 1012, "Shift Relief and Log Entries," states that the Shift Foreman log is to be a detailed narrative of major plant status changes, problems, or

abnormalities. The change in position of FS-V-652 and SBO diesel inoperability was not logged.

The inspector concluded that although the diesel is not considered safety related equipment, this incident reflects a weakness in maintaining control of the status of important plant components.

### **3.0 EVAPORATION OF TMI UNIT 2 ACCIDENT GENERATED WATER (71707)**

The inspectors observed overall evaporator operation and verified that the evaporator was operated in accordance with licensee procedures and regulatory requirements. The Accident Generated Water (AGW) evaporator resumed vaporizing water to the atmosphere on November 25, 1992. The evaporator had been operating in a decoupled mode since June 11, 1992, where the condensate produced in the first part of the AGW system was sent to a storage tank rather than be vaporized to the atmosphere. The licensee operated in the decoupled mode due to slightly higher radioactivity of the AGW, necessitating processing the water twice. At the close of the inspection period approximately 1,299,000 gallons had been vaporized overall to date.

The inspectors identified no conditions that were adverse to safety or contrary to regulatory requirements.

### **4.0 RADIOLOGICAL CONTROLS (71707)**

During entry into and exit from radiologically controlled areas, the inspectors verified that proper warning signs were posted, personnel entering were wearing proper dosimetry, personnel and material leaving were properly monitored for radioactive contamination, and monitoring instruments were functional and in calibration. The inspectors also reviewed extended Radiation Work Permits (RWPs) and survey status boards to verify that they were current and accurate. The inspectors observed activities in radiologically controlled areas and verified that personnel were complying with the requirements of applicable RWPs and that workers were aware of the radiological conditions in the area.

During routine auxiliary building tours, the inspector paid particular attention to ensure radiological surveys were current and that the proper warning signs were posted. The inspector noted no discrepancies and concluded that overall radiological controls were good.

### **5.0 MAINTENANCE AND SURVEILLANCE (62703, 61726, 71707)**

#### **5.1 Maintenance Observations**

The inspector reviewed selected maintenance activities to assure that: the activity did not violate Technical Specification Limiting Conditions for Operation and that redundant components were operable; required approvals and releases had been obtained prior to

commencing work; procedures used for the task were adequate and work was within the skills of the trade; maintenance technicians were properly qualified; radiological and fire preventive controls were adequate; and, equipment was properly tested and returned to service.

Maintenance activities reviewed included:

- Job Order No. 056439, "Brass Chips Found on NR-P-1B Packing Leakoff Indicating Bearing Wear," was inspected on November 11, 1992.
- Corrective Maintenance Procedure 1410-Y-26, "Control of Hot Work," was inspected on November 26, 1992.
- Job Order No. 055173, "Calibration of GE Type 180 Panel Meters," was inspected on November 7, 1992.
- Job Order No. 063016, "HD-V-18C Valve Repair," was inspected on October 6, 1992.

For nuclear river water pump maintenance (Job Order No. 056439), the inspector found that individuals performing the maintenance were knowledgeable, maintenance procedure quality was good, and proper QA documentation existed for replacement parts. The inspector concluded that overall performance of this maintenance activity was excellent. A detailed evaluation the HD-V-18C repair can be found section 8.3. The inspector had several concerns with the control of liquid petroleum gas and the changing of PM frequencies which are discussed in sections 5.2 and 5.4.

## 5.2 Fuel Bottles Located Next to Borated Water Storage Tank

On November 23, 1992, the inspector noted two unsupported 30-gallon bottles of liquid petroleum gas stored within 15 feet of the borated water storage tank (BWST). The bottles were being used by the electrical maintenance personnel to supply fuel to a portable heater. The inspector was concerned because the bottles were a missile hazard since they were unsupported and also a fire hazard. The inspector raised his concerns to the licensee's fire protection engineer, who had the bottles tied to a cement block 30 feet away from the BWST. Discussions with the licensee indicated that no evaluation of the location of the bottles had been performed.

To prevent recurrence of a similar incident the licensee changed Corrective Maintenance Procedure 1410-Y-26, "Control of Hot Work," to provide a permit system for the use of liquid or gas fueled portable heaters. The permit will allow cognizant personnel to review the hazards associated with the type and volume of fuel and the potential affect of the fuel on safety related equipment.



The inspector reviewed the licensee's corrective actions and found they were adequate to prevent recurrence of a similar incident.

### 5.3 Missed Core Flood Tank Sampling Surveillance

The inspector reviewed past Plant Review Group (PRG) meeting minutes and noted that Meeting Number 92-002 described a missed core flood tank sampling surveillance. Technical Specification 4.1.2 requires that equipment sampling and testing be performed as detailed in Tables 4.1-2 and 4.1-3. Technical Specification Table 4.1-3, item 3, requires a monthly determination of boron concentration in the core flood tanks. Technical Specification 3.3.1.2.b requires a minimum concentration of 2270 ppm boron. A sample was taken on November 13, 1991. The next sample was scheduled for December 14, 1991, with a late date of December 21, 1991. On December 23, 1991, the licensee determined that the sample was missed and sampled the core flood tanks that day. The boron concentration in both tanks was above the technical specification limit (2319 ppm for the 'A' tank and 2375 ppm for the 'B' tank). There was no Shift Foreman log entry to document the missed surveillance as required by Administrative Procedure 1012, "Shift Relief and Log Entries."

The licensee determined that the cause of the missed surveillance was the misfiling of the surveillance scheduling sheet. These scheduling sheets are stored in a binder chronologically by due date. The corrective action is to use the computer data base to independently identify and track the status of current and completed surveillances. In addition, the core flood tank sampling surveillance was added to the daily chemistry schedule as a fixed weekly task.

The PRG evaluated whether the technical specification violation was reportable. The PRG determined that since the sample results determined the boron concentration to be within the limits of the limiting condition for operation, no operation or condition prohibited by technical specifications occurred and this event is not reportable under 10 CFR 50.72 or 50.73. The licensee based this conclusion on the draft wording of 10 CFR 50.73 proposed rule changes published in the Federal Register (Volume 47, Number 88) on May 6, 1982, and subsequent comments by the public. In the discussion of section 50.73(a)(4), proposed rule states in part that "The licensee must report events where an Action Statement contained in a Limiting Condition for Operation is not met. For an Action Statement that gives the licensee alternatives, the Action Statement is met if either alternative is met. Failure to comply with a Surveillance Requirement need not be reported as an LER, but should be tabulated in the Monthly Operating Report." The licensee interpreted this proposed rule change to indicate that as long as the equipment/component was shown to have remained operable, and that only the surveillance interval was missed, an LER was not required. The licensee interpreted this section to support their conclusion that a missing surveillance interval was not a condition prohibited by technical specifications and this event was not reportable under 10 CFR 50.72 or 50.73.

On December 1, 1992, the inspector with the aid of the NRR Project Manager referred this specific situation to the NRC Technical Staff for their understanding of the intent of the data

that is collected by the LER rule. The NRC Technical Staff considered missing a surveillance interval information that the NRC Staff desired to gather using the LER rule (10 CFR 50.73). This position was clarified in Generic Letter (GL) 87-09 dated June 4, 1987, addressing Limiting Conditions for Operation and Surveillance Requirements for Standard Technical Specifications. In the Generic Letter, the NRC stated that the failure to perform a surveillance within the allowable surveillance interval defined by Specification 4.0.2 constitutes a reportable event under 10 CFR 50.73(a)(2)(i)(B) because it is a condition prohibited by the plant's Technical Specification. Section 4.0.3 of the Standard Technical Specifications addresses the operability of equipment associated with the failure to perform a Surveillance Requirement within the allowable surveillance interval. This requirement for TMI Unit 1 is addressed in the plant's Technical Specifications, Section 4 introductory paragraph. The equipment testing and system sampling frequencies specified in the surveillance section of the Technical Specifications are used to maintain the equipment and systems in a safe operational status. Exceeding the surveillance time interval was considered by the inspector a condition prohibited by TMI Technical Specification 4.1.2 that established minimum frequencies and was reportable per 10 CFR 50.73(a)(2)(i)(B). Based on this information, the inspector disagreed with the PRG's reportability evaluation. The inspector discussed the reportability issue with the licensee and they still maintained that the incident was not reportable.

The inspector concluded that the failure to sample the core flood tank at the required monthly frequency is a violation of Technical Specification 4.1.2. The response to the missed surveillance was appropriate and the results were acceptable. However, the inspector also concluded that the failure to report the missed core flood tank sampling surveillance is a violation of 10 CFR 50.73(a)(2)(i)(B.) (50-289/92-20-01)

The above-noted violation is of minor safety significance; however, the use of enforcement discretion is not possible since the licensee has not acknowledged the violation.

#### 5.4 Preventive Maintenance Frequency Changes

On November 6, 1992, the inspector noted that the calibration stickers on six ammeters on the 1S and 1P 480 volt class 1E switchgear had a calibration due date of June 15, 1992. Although the licensee no longer uses calibration stickers, the inspector questioned if the licensee had missed the calibration. The inspector reviewed the licensee's computer based machinery history and found that the preventive maintenance (PM) activity to calibrate the ammeters had been scheduled for April 7, 1992, but was canceled. The basis given in the database for the cancellation was to reschedule the calibration to coincide with the switchgear cleaning and inspection which is scheduled for July 1994. The licensee stated that consolidating PM tasks into system outages enhances plant safety by minimizing system unavailabilities.

The inspector questioned the licensee concerning the adequacy of this basis because it explains why the licensee wants the frequency changed but does not provide a technical basis

why the change was acceptable. The licensee and inspector reviewed the vendor technical manual and found no recommended calibration frequency. The licensee also indicated that the ammeters do not have a history of failure or being out of calibration. Based on this review, the inspector determined that the ammeter PM change was acceptable.

Further inspector review found that the licensee has no formal method or criteria for evaluating and documenting changes to PM frequencies. PMs which are rescheduled to coincide with a system outage are generally reviewed by the maintenance foremen, the lead group supervisor, and the manager of plant material. There is no administrative requirement to perform this review and there is no guidance as to the extent of this review. The licensee does not believe that a formal method is necessary.

The inspector concluded that the lack of a program to formally evaluate and document technical bases for PM frequency changes is a weakness that warrants further licensee review. Consolidating system unavailabilities can enhance plant safety only if the reduced PM frequencies do not result in increased component failures or reduced component reliability.

### 5.5 Reactor Building Radiation Monitor Surveillance

On October 19, 1992, the licensee performed the quarterly calibration of the iodine channel on RM-A2, the reactor building atmospheric monitor, per Surveillance Procedure (SP) 1302-3.1, "Radiation Monitoring System Calibration." RM-A2 is a particulate-iodine-gas type sampling unit located in the intermediate building, with sample air drawn from the reactor building and returned to the reactor building. Due to an improper valve lineup subsequent to completion of the surveillance, the radiation monitor was rendered inoperable for greater than the technical specification allotted time.

SP 1302-3.1 purges RM-A2 to reduce background radiation readings by closing CM-V-4, the sample pump suction valve from the reactor building, and opening V-9, the sample pump suction/purge valve from the intermediate building. After a two-minute purge, the sample pump discharge valve was closed and the sample pump was secured. SP 1302-3.1 then required V-9 to be closed but this was not accomplished. The technician completed the calibration and considered RM-A2 properly returned to service. Since V-9 remained open, the reactor building air was diluted by the intermediate building air resulting in low RM-A2 channel indications. The particulate channel indication was approximately one-fifth of the recorded indication before RM-A2 was removed from service and the gas channel levels were reduced by approximately one-half. The low RM-A2 channel indications were noted and V-9 was shut approximately 12 hours after RM-A2 was removed from service. Technical Specification 3.1.6.8 requires a reactor building sample be taken every eight hours when RM-A2 is inoperable. Since the licensee was unaware that V-9 was open, this sample was not taken. The licensee reported this technical specification non-compliance as required by 50.73 (A)(2)(i)(b).



The licensee conducted a formal Human Performance Enhancement System (HPES) investigation into this incident and found several root causes. The step that closes V-9 is not contained in the iodine channel calibration section but is a referenced step contained in the particulate channel calibration section of the procedure. The steps in the particulate section of the procedure were not initialed when completed and the pages containing these steps were not included in the completed work package. The supervisor did not note the missing pages when reviewing the work package. The HPES report also noted that the procedure does not contain an independent verification of system lineup following surveillance completion and the procedure does not compare before and after radiation levels. The report indicated that prior to this incident, the technician had successfully completed the surveillance eight times.

The inspector reviewed Licensee Event Report (LER) 92-003-00 associated with this incident. The licensee's corrective actions include: counseling the I&C technician on the importance of completing all procedure steps, and reviewing all radiation monitoring system procedures to add an independent verification of proper valve realignment as appropriate.

The inspector evaluated the safety significance of this incident. Technical Specifications limit to eight hours the time RM-A2 can be inoperable without taking a reactor building sample because of the ability of the detector to detect a small reactor coolant system leak in a short period of time (a leak of less than 1 gpm will be detected within one hour). The three alternate means of detecting coolant leakage, the mass balance technique, the reactor building sump level increase, and reactor building cooling coil condensate flow measurements, were all available during the time RM-A2 was inoperable. The licensee still had the ability to detect changes in reactor building activity after RM-A2 was believed to have been returned to service but the indication would be further from the alarm setpoint. Since the time period RM-A2 was inoperable was very short and the other means of detecting reactor coolant system leakage were available, the safety significance of this incident was minimal.

The inspector concluded that the failure to shut V-9 in accordance with SP 1302-3.1 is a violation of Technical Specification 6.8.1. The licensee's corrective actions are adequate to prevent recurrence of this incident. For this reason, this violation was not cited pursuant to NRC Enforcement Policy, 10 CFR Part 2, Appendix C (1992), Section V, G.

## **6.0 SECURITY (71707)**

The inspectors verified the implementation of the Physical Security Plan by verifying: Protected Area and Vital Area barriers were well maintained and not compromised; isolation zones were clear; personnel and vehicles entering and packages being delivered to the Protected Area were properly searched and access control was in accordance with approved licensee procedures; persons granted access to the site were badged to indicate whether they have unescorted access or escorted authorization; security access controls to Vital Areas were being maintained and that persons in Vital Areas were properly authorized; security posts were adequately staffed and equipped; and adequate illumination was maintained.



During evening backshift inspections the inspectors toured the protected area to verify that temporary lighting was sufficient and functioning properly. During the period of time the secondary alarm station was unavailable, the inspector verified that the licensee implemented appropriate compensatory measures. The inspectors concluded that the Security Plan was properly implemented.

## **7.0 SAFETY ASSESSMENT/QUALITY VERIFICATION (40500)**

On November 16 and 17, 1992, the inspector attended General Office Review Board meetings and found that the board's review of safety issues was comprehensive and demonstrated the proper safety perspective.

## **8.0 ENGINEERING AND TECHNICAL SUPPORT (37700, 40500)**

### **8.1 Design Modification for Spent Fuel Pool Partial Re-Racking**

The inspector reviewed the licensee's modification design description MDD-254A-Division 1, safety evaluation SE 412076-001, Installation Specification TI-IS-412076-001, and the contractor (Holtec International) installation and test procedures series HPP-90310 for the installation of the new high density poisoned fuel racks in the 'A' fuel storage pool. The inspector also reviewed the NRC Safety Evaluation related to Amendment No. 164 for the technical specification changes for the new fuel storage rack installation.

The modification included the removal of eight old storage racks that were fastened to the pool walls and base, and their replacement with six new free standing, poisoned, high density storage racks designed to seismic category I requirements. The old 'A' pool racks contained 253 spent fuel storage locations whereas the new racks contain 846 storage locations of which 100 are presently in use. The north end of the pool, presently free of racks, can provide 648 storage locations with the installation of six more racks. The spent fuel storage capability would be extended to full plant life with the 1494 storage locations provided when all new fuel racks are installed.

The inspector observed the removal of the old racks and installation of the new racks in progress. The inspector verified that 25% of the new rack storage locations were tested for alignment by a drag test of a dummy fuel assembly. The 150-pound maximum drag limit for insertion and removal was met in all tests. The inspector also verified the satisfactory performance of the test which determines the effectiveness of the boral poisoned cells and establishes a baseline for future coupon surveillances.

The inspector reviewed Field Questionnaire No. C 092196, pertaining to a slight misalignment of the new C-1 rack. Discussions with the lead nuclear engineer indicated that fuel movement for the new racks in the north-south direction was to be accomplished by only bridge movement and in the east-west direction only by trolley movement. Currently, movement of fuel from the C-1 to E racks requires both bridge and trolley movement. A

meeting between the licensee and contractor has been scheduled to resolve this issue. The inspector does not consider this issue to be a safety concern.

The inspector determined that fuel storage pool 'A' contains two boron coupon trees that have actual rack material coupons. Testing of the coupons is to be done on a systematic basis for the life of the plant.

The inspector found that the modification packages and contractor installation procedures were comprehensive and fully descriptive of the installation. The inspector concluded the partial re-racking modification of the 'A' spent fuel pool was a coordinated team effort of corporate and site engineering and there was management involvement.

#### **8.2 (Closed) Unresolved Item 50-289/91-20-01: DH-V-22B, CF-V-4B, and CF-V-5B Seat Leakage**

This issue concerned whether the leak rates through DH-V-22B, CF-V-4B, and CF-V-5B, as evidenced by changes in core flood tank level, were within the technical specification required band. This issue was made unresolved pending completion of leak rate testing. The licensee performed leak testing of valves DH-V-22B, CF-V-4B, and CF-V-5B in accordance with Surveillance Procedure 1300-3T, "Pressure Isolation Test of CF-V-4A/B, 5A/B, and DH-V-22A/B," during the last refueling outage. The inspector verified that leakage was within the procedure acceptance limits.

In addition, CF-V-4B was opened on November 4, 1991, due to a bonnet leak. The valve internals were inspected and the valve was manually exercised. Both the internals inspection and the exercising results were satisfactory.

The inspector had no further concerns related to leakage through these check valves. This item is closed.

#### **8.3 Repair Of Valve HD-V-18C Body Wall Leak**

The inspector reviewed the licensee's activities associated with the repair of a through wall leak on HD-V-18C, the 'C' heater drain pump discharge check valve. The inspector evaluated the repair of this valve due to the personnel safety implications. The leak was identified on September 28, 1992. HD-V-18C is an original equipment 8" Crane Company, 400 Class, cast steel, vertically mounted, swing check valve which was purchased to ANSI B16.55 and B16.3434 requirements. Based on visual and nondestructive examination (NDE), the licensee determined that the leak was caused by a pre-existing defect in the casting that opened as a result of thermal cycling. The casting also appeared to have some original foundry repair welding in another location near the leak.

The inspector reviewed engineering evaluation request (EER) 92-0417 and observed the pre-weld body wall excavation, in-process welding, and NDE. The initial excavation

approximately 1" in diameter and 5/8" deep and was intended to remove porosity at the leak location. The secondary excavation was 3/8" deep by 1 1/2 " long to remove a 3/8" below surface linear indication that started in the initial excavation and progressed in the horizontal direction. The inspector verified that the grinding removed porosity and linear indications to within the ANSI B16.34-1977, Annex C, examination and acceptance provisions.

Wet magnetic particle examination was effectively used to identify the porosity and linear indications for their removal during the excavating process. Subsequent to the start of welding, the licensee used dry magnetic particle testing to examine the root pass, two adjacent passes, and every three weld passes thereafter. The final cap passes were also examined. The inspector observed the magnetic particle testing and verified each of the weld examinations was acceptable and that a 300°F preheat and minimum temperature was maintained during welding as specified in EER 42-0417. Testing at system pressure following welding provided additional verification that the repair was effective.

The inspector noted that the engineer who prepared the EER, the welding supervisor, and the QA NDE technician monitored each step of the valve repair. The inspector concluded that the licensee's repair of valve HD-V-18C was well engineered and performed.

## **9.0 NRC MANAGEMENT MEETINGS AND OTHER ACTIVITIES (30702)**

### **9.1 Routine Meetings**

At periodic intervals during this inspection, meetings were held with senior plant management to discuss licensee activities and areas of concern to the inspectors. At the conclusion of the reporting period, the resident inspector staff conducted an exit meeting with licensee management summarizing inspection activities and findings for this reporting period. No proprietary information was identified as being included in the report. There are no issues in this report related to Unit 2 Post-Defueling-Monitored-Storage.