U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-219/85-38

Docket No. 50-219

License No. DPR-16 Priority -- Category C

Licensee: GPU Nuclear Corporation
100 Interpace Parkway
Parsippany, New Jersey 07054

Facility Name: Oyster Creek Nuclear Generating Station

Inspection At: Forked River, New Jersey

Inspection Conducted: December 2, 1985 - January 5, 1986

Participating Inspectors: W. H. Bateman, Senior Resident Inspector
J. F. Wechselberger, Resident Inspector
R. J. Urban, Reactor Engineer

Approved by:

A. R. Blough, Chief
Reactor Projects Section 1A

1-28-86
Date

Inspection Summary: Routine onsite inspections were conducted by the resident inspectors with Region based in office support (125 hours) of activities in progress including plant operations, physical security, radiation control, housekeeping, and receipt, handling, and storage of new fuel. The inspectors also met with Technical Functions management to discuss organization and Maintenance, Construction, and Facilities to discuss their training programs. During this report period, the inspectors pursued environmental qualification concerns and results are documented in Inspection Report 85-39.

Results: No violations or unresolved items were identified during this report period. Concerns with the plant's HVAC systems were expressed and the licensee will brief the resident inspectors on short and long term plans to continue upgrading HVAC. One reactor trip occurred and plant and operator response was satisfactory. Twenty-four workers were slightly contaminated by airborne contaminants following loss of power to the New Radwaste and Augmented Offgas buildings. Minor uptake of radioactive iodine 131 by workers in the drywell occurred during a containment entry. Region based inspectors followed up this event and documented their activities in Inspection Report 85-40. Drywell unidentified leakage, which was increasing prior to the scram, was investigated and repaired after the scram prior to the subsequent startup.

DETAILS

1. Plant Operation Review

1.1 Routine tours of the control room were conducted by the inspectors during which time the following documents were reviewed:

-- Control Room and Group Supervisor's Logs;

-- Technical Specification Log;

-- Control Room and Shift Supervisor's Turnover Check Lists;

-- Reactor Building and Turbine Building Tour Sheets;

-- Equipment Control Logs;

-- Standing Orders; and,

-- Operational Memos and Directives.

The reviews indicated that the logs were generally complete.

On one occasion during this inspection period, the inspector entered the control room to find the control room operators congregated in the shift supervisor's office and the shift technical advisor (STA), who holds a Senior Reactor Operator (SRO) license, "at the controls." A licensed operator is required to be "at the controls" at all times when fuel is in the vessel. Although the STA holds a current SRO license, the inspectors did not feel that it was appropriate for the STA to assume the "at the controls" responsibility. This situation was discussed with the Director of Operations. Immediate corrective action was taken by the Director to clarify procedure 106, "Conduct of Operations", to exclude the on-shift STA from assignment "at the controls." He also discussed the situation with on shift personnel. In addition, the Director plans to discuss this situation and other areas for improvement with each operator individually. The inspectors were satisfied that sufficient corrective action was taken. The inspectors had no further questions.

1.2 Routine tours of the facility were conducted by the inspectors to make an assessment of the equipment conditions, safety, and adherence to operating procedures and regulatory requirements. The following areas were among those inspected.

-- Turbine Building

-- Vital Switchgear Rooms

-- Cable Spreading Room

-- Diesel Generator Building

-- Reactor Building

The following items were observed or verified:

a. Fire Protection:

-- Randomly selected fire extinguishers were accessible and inspected on schedule.

-- Fire doors were unobstructed and in their proper position.

-- Ignition sources and combustible materials were controlled in accordance with the licensee's approved procedures.

-- Appropriate fire watches or fire patrols were stationed when equipment was out of service.

b. Equipment Control:

-- Jumper and equipment mark-ups did not conflict with Technical Specification requirements.

-- Conditions requiring the use of jumpers received prompt licensee attention.

-- Administrative controls for the use of jumpers and equipment mark-ups were properly implemented.

c. Vital Instrumentation:

-- Selected instruments appeared functional and demonstrated parameters within Technical Specification Limiting Conditions for Operation.

d. Housekeeping:

-- Plant housekeeping and cleanliness were in accordance with approved licensee programs.

1.3 During this report period, the inspectors observed receipt, handling, and storage of new fuel. Prior to inspection, the new fuel was temporarily stored on the 119' elevation of the reactor building. A criticality monitor was appropriately located on the 119' elevation to warn occupants should an inadvertent criticality occur. No deficiencies were identified.

2. Followup of Operational Events

2.1 A reactor scram from full power occurred on December 15, 1985 due to high neutron flux. The high neutron flux resulted from a pressure increase caused by sudden closure of the turbine control valves. The cause for the sudden closure of the turbine control valves was determined to be loose wires in the turbine control valves' feedback circuit to the electric pressure regulator.

Operator and plant response to the reactor trip was without major incident. Recovery of reactor water level resulted in exceeding narrow range level indication which has been a problem in the past. A subsequent post trip review identified this as the only deficiency in the operators' response.

The loose wires were tightened and, after efforts to repair a leaking valve in the drywell (see 2.2 below), the plant was restarted December 16 and achieved full power December 20.

The NRC inspectors have in the past expressed concerns regarding operator control of reactor water level during scram recovery operations. The licensee has committed to additional training in this area. No new inspector concerns were identified as a result of observations and subsequent followup inspection activities relating to this reactor trip.

2.2 At the beginning of this report period, the drywell unidentified leakrate was slowly increasing and had reached approximately 3.5 gpm prior to the December 15 reactor trip. The Technical Specification limit is 5 gpm. Immediately after the scram, the drywell was de-inerted and an entry made to determine the source of the leak. The leak was found to be from the bonnet to body pressure seal on valve V-2-36, a feedwater gate valve. This valve has been the source of high unidentified leakrate problems in the past. Because the valve is unisolable from the reactor vessel, attempts have been made to stop the leak by injecting sealant into the body to bonnet pressure seal area. This has been successful in slowing down the leak but thermal cycles of the valve encountered during shutdowns or scrams tend to reopen the leak path. Recent thermal cycles of the valve occurred when the plant was shutdown during October and November and later in November when the plant tripped as the result of a generator current transformer failure. Another temporary repair of the leak was performed prior to restart by again injecting sealant into the body to bonnet pressure seal area. Unidentified leakage since this repair has been at normal levels of about 1 gpm, thus, indicating the temporary repair was successful.

2.3 Recirculation Pump "C" Trip

On December 18, "C" reactor recirculation pump tripped as a result of a faulty speed control module. After the pump tripped the control room operators were unable to shut the recirculation pump discharge

valve from the control room. At Oyster Creek the discharge valve does not shut automatically upon recirculation pump trip and has to be shut by the control room operators. The operators dispatched an electrician to the valve's electrical circuit breaker to override the discharge valve trip condition and shut the valve locally from the breaker panel. It took 24 minutes to shut the discharge valve after the pump tripped.

During this period with the recirculation pump tripped and its discharge valve open, an erroneous recirculation flow condition existed. The reverse flow through the recirculation loop is measured by the loop flow instrumentation and is transmitted as a normal flow signal, although slightly diminished, to the reactor protection system (RPS). The actual flow through the core is decreased by loss of flow from the non-operating recirculation pump. This operating condition with decreased core power and approximately the same flow signal to RPS, while actual core flow was decreased, represented a change in the operating point with respect to the power-to-flow limiting safety system settings (LSSS). During a reactivity addition transient, the time to trip and the amount of reactivity added would have been increased in proportion to the increased margin in the power-to-flow LSSS, although the high power trip setpoint remained unchanged. The licensee plans to submit a Licensee Event Report to describe this occurrence.

The licensee plans to investigate the reason the control room operators were unable to close the recirculation discharge valve from the control room and to determine if the other recirculation valves have similar problems. The inspectors will follow licensee action to address this concern (219/85-38-01).

3. Radiation Protection

3.1 At approximately 10:20am on December 11, 1985, breaker 1E1 tripped causing a loss of power to the Augmented Offgas (AOG) and New Radwaste (NRW) buildings. Inadvertent grounding of a redundant feedwater pump breaker caused the trip.

Within ten minutes, the NRW building had airborne contamination with short-lived cesium 138 and rubidium 88 due to backflow from the plant stack into the NRW building via interconnecting ductwork. Six people in the NRW building were contaminated; five people had clothing contamination and one person had skin and clothing contamination.

When power was lost to the AOG building, the system automatically realigned to discharge the offgas flow directly to the plant stack, bypassing the AOG system. When this occurred, 100 psi air automatically started to purge hydrogen from the isolated recombiner portion of the AOG system. Due to leaks in the piping system, added pressurization of the piping system by the purge air, and lack of ventilation, the AOG building became airborne with cesium 138 and rubidium

88. A radiological controls technician in the AOG building was contaminated on the skin and clothing while he was pulling air samples in response to a Continuous Air Monitor (CAM) alarm.

At 11:05am, power was restored to breaker 1E1. At that time the ventilation system in the AOG building restarted and began venting airborne radioactivity directly outside. The radiation monitor associated with the ventilation system was inoperable because after a loss of power, the monitor must be locally reset in order to function. Therefore, the licensee did not realize that they were venting airborne radioactivity from inside the AOG building.

As a result of the venting, three people outside the radiologically controlled area (RCA) near the AOG building and fourteen people inside the RCA in close proximity to the AOG building were contaminated. The licensee realized this problem when one individual set off a portal monitor at the main gate. One person had skin contamination and sixteen people had clothing contamination.

The total number of people contaminated in the event was twenty-four; one on the skin, two on the skin and clothing, and twenty-one on the clothing. The licensee estimated that the maximum total dose to any individual was 1.6 millirem. The maximum off-site dose rate was calculated to be .051 millirem per hour. These values are far below NRC limits. Since the contamination was due to noble radioactive gas, no individuals had to be decontaminated. The contamination decayed away quickly and the workers were back on duty within one hour.

The problem that led to the release of radioactive gas in the NRW building was backflow through a faulty damper in the interconnecting ductwork. Engineering evaluation of a fix for this damper had been in progress prior to this event and is continuing. This issue of ventilation problems was discussed at the exit meeting (see Detail 7). The cause of the airborne release from the AOG building was attributed to leaks from the AOG piping system. The licensee performed helium leak testing of the system after this event in an effort to identify the leak paths. Several were identified and repaired. At the end of the report period, the AOG system was operating and still experiencing minor cesium leaks. Efforts are continuing to identify the source of these leaks and additional helium leak testing is planned later in January 1986, if necessary.

3.2 During entry to and exit from the RCA, the inspectors verified that proper warning signs were posted, personnel entering were wearing proper dosimetry, personnel and materials leaving were properly monitored for radioactive contamination, and monitoring instruments were functional and in calibration. Posted extended Radiation Work Permits (RWP's) and survey status boards were reviewed to verify that they were current and accurate. The inspector observed activities in the RCA to verify that personnel complied with the requirements of

applicable RWP's and that workers were aware of the radiological conditions in the area.

3.3 During this report period, the licensee informed the inspectors of a modified radiation exposure control system for certain GPUN and contractor employees. In particular, any person whose total lifetime dose is greater than 50 rem or whose lifetime dose is equal to or greater than their age, shall, as of January 1, 1986, be limited to an annual exposure of a maximum of 500 millirem per year. The licensee stated that a total of 15 people are affected by this new limit.

This step is a positive initiative in controlling personnel exposure.

3.4 In NRC Inspection Report 85-33, it was stated at the end of paragraph 5.0 that the licensee was investigating all significant inhalation doses over the lifetime of the plant and that a status report would be available for NRC review by December 31, 1985. The inspectors reviewed the status of the investigation and determined that of 91 possible overexposures initially identified from the 1970's time period, only 47 remain suspect. The licensee's investigation is scheduled for completion in March 1986.

3.5 During drywell entries made after the December 15 reactor trip to investigate the source of the high unidentified leakrate, problems were encountered with inadvertent personnel exposure to air concentrations of iodine 131 exceeding 25% MPC. This resulted in eighteen people receiving between 2 and 29 MPC hours. Although this exposure was unexpected, it was still below NRC limits. Additional followup inspection of this event was performed by Region I based specialists whose inspection activities are documented in Inspection Report 85-40.

4. Observation of Physical Security

During daily entry and egress from the protected area, the inspectors verified that access controls were in accordance with the security plan and that security posts were properly manned. During facility tours, the inspectors verified that protected area gates were locked or guarded and that isolation zones were free of obstructions. The inspectors examined vital area access points to verify that they were properly locked or guarded and that access control was in accordance with the security plan.

No discrepancies were identified.

5. Management Meetings

The inspectors attended three meetings with licensee management as briefly summarized below. These meetings were held as part of the licensee's continuing efforts to improve the NRC resident inspectors' understanding of

Maintenance, Construction, and Facilities (MCF) training programs, the Technical Functions organization, and I&C training and manning levels.

-- The MCF training coordinator explained the classroom and on-the-job training programs for in house electricans, mechanics, and instrumentation and control (I&C) technicians. The program appears to be well designed and well under way for the I&C technicians.

-- The onsite Manager of Technical Functions continued to describe the Technical Functions organization and how it interfaces with other divisions. The presentation was informative.

-- A meeting was held with the area supervisor of I&C to discuss training status and manning levels of the I&C group. It was concluded from this meeting that a sufficient number of qualified technicians are available to support the I&C workload involving safety significant surveillances. It was also learned that the backlog of outstanding items has been reduced based, in part, on the improved training of I&C technicians.

The area supervisor also explained that an extensive interview process has been initiated that requires potential candidates for a job as an I&C technician to take a comprehensive oral, written, and practical factors examination to determine his or her suitability.

6. Environmental Qualification (EQ)

Paragraph 50.49 of 10 CFR 50, as supplemented by several GPUN letters, required that safety-related equipment at Oyster Creek meet EQ program requirements by November 30, 1985. A question involving the EQ status of terminal boxes in the electrical flowpath of the main steam line low pressure sensing devices was pursued during this report period. A special inspection report (85-39) was written to document these inspection activities.

7. Exit Interview

A summary of the results of the inspection activities performed during this report period were made at a meeting with senior licensee management at the end of the inspection. At this meeting the inspectors expressed a concern regarding the myriad of HVAC problems and requested that the licensee explain their action plan to address the short term problems and the long range planning to continue to upgrade HVAC at Oyster Creek. The licensee agreed to make a presentation during the next report period.

The licensee stated that, of the subjects discussed at the exit interview, no proprietary information was included.