U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-219/86-41

Docket No. 50-219

License No. DPR-16 Priority Category C

Licensee: GPU Nuclear Corporation
P.O. Box 388
Forked River, New Jersey 08731

Facility Name: Oyster Creek Nuclear Generating Station

Inspection At: Forked River, New Jersey

Inspection Conducted: December 15-19, 1986

Inspectors: S. Sherbini 1/30/87
S. Sherbini, Radiation Specialist date
Facilities Radiation Protection Section

Jean A. Cioffi 1/30/87
J. Cioffi, Radiation Specialist date
Facilities Radiation Protection Section

Approved by: M. Shanbaky 1/30/87
M. M. Shanbaky, Chief date
Facilities Radiation Protection Section

Inspection Summary: Inspection on December 15-19, 1986

Areas Inspected: A reactive inspection to review the circumstances related to an unplanned exposure during preparation of a resin liner/cask for shipment.

Results: Two violations were identified which involve failure to perform an adequate radiological survey (10 CFR 20.201b) and failure to instruct workers in accordance with 10 CFR 19.12. Details are provided in attached report.

Details

1.0 Personnel Contacted

1.1 Licensee Personnel

S. Bachhal, Chem Nuclear Solidification Technician
F. Decker, Chem Nuclear, Solidification Technician
* P. Fiedler, Vice President and Station Director
* C. Halbfoster, Manager, Chemistry and Acting Manager, Radwaste
M. Heller, Licensing Engineer
J. Kowalski, Manager, Licensing, Oyster Creek
* B. Leavitt, Radiological Controls Deputy Director
* M. Littleton, Manager, Radiological Engineering
S. McAllister, Supervisor, Radiological Training
J. Sullivan, Director, Plant Operations, Oyster Creek
W. Scott, Radiological Engineer
D. Turner, Director, Radiological Controls
A. Wacha, Supervisor, Radwaste Shipping

1.2 NRC Personnel

W. Bateman, Senior Resident Inspector
J. Wechselberger, Resident Inspector
* M. Shanbaky, Chief, Facilities Radiation Protection Section

* denotes attendance at the exit meeting

2.0 Purpose

The purpose of this reactive inspection was to investigate the circumstances surrounding an exposure in excess of the administrative limits. This exposure involved one Chem Nuclear technician and occurred during preparation of a resin liner/cask for shipment.

3.0 Description of the Event

On December 8, 1986, a Chem Nuclear technician exceeded his quarterly administrative exposure limit of 1250 millirem (mrem) by 33 mrem. The exposure was received during work on a liner/cask containing dewatered reactor cleanup resin in the New Radwaste Building. The work involved removing and bagging the fill head from the top of the liner, taking a grab sample of resin for analysis, and sealing the liner in preparation for shipment. This operation was performed by two Chem Nuclear technicians with health physics coverage being provided by a radiological controls technician.

The first part of the operation involved removing the fill head, taking a resin sample and then bagging the fill head. According to the licensee's Radiological Incident Report (RIR) and written statements from the workers involved, this phase was completed in approximately 3 to 4 minutes, and the technicians stood on the ground next to the cask in relatively low radiation fields.

During the second phase of the work, one of the Chem Nuclear technicians pushed some herculite, used for contamination control, into the liner and installed and tightened the liner cover. This technician stood on a shield that was installed on top of the cask. He was assisted by the second Chem Nuclear technician who stood on a ladder on the side of the cask. The Radiological Controls technician also stood on a ladder on the side of the cask. The shield was provided with an opening in the center to allow access to the liner. Licensee surveys indicated that, for the technician standing on top of the shield, this phase of the operation was performed in a radiation field that varied from 20 R/hr at 3 feet from the shield opening to 85 R/hr at the opening. The other two technicians standing on the ladders, were in fields that reached up to 600 mR/hr. According to the RIR and written statements, this phase of the work was completed in approximately 30 seconds.

The Radiological Controls technician measured the exposure rate at 1 foot from the access opening in the shield during installation of the liner cover and found it to be about 40 R/hr. He ordered the two technicians who were tightening the cover away from the top of the cask. The technicians immediately evacuated the top of the liner. However, due to the high dose rate in the area, one of the radwaste technicians had already received an exposure, as indicated by his self reading dosimeter, that raised his total dose for the quarter above his administrative limit. The TLD dosimeters were sent for immediate evaluation, and the worker involved was suspended from further work in the radiological controls area until an investigation was completed. The TLD readings confirmed the conclusion based on the self reading dosimeter that the administrative limit was exceeded. Although the applicable regulatory limit (3 rem/calendar quarter) was not exceeded, this was fortuitous since potential for significantly higher dose rates existed.

4.0 Radiological Conditions

The transfer, loading, and shipment of the resin is covered by a job specific RWP that is renewed on a monthly basis, as needed. The RWP covering the incident of December 8, 1986 was generated on November 14 and expired December 13, 1986. The survey used with that RWP showed a maximum exposure rate of 20 mR/hr with a general area field of 5 mR/hr. Attached to the RWP was a generic, or standing, ALARA review. That review was generated on January 1, 1986 and the expiration date was December 31, 1986.

The monitoring requirements specified in the RWP were as follows:

- At start of job
- Dose rate meter in high radiation areas
- Intermittent
- Continuous during transfer
- As per ALARA REVIEW

The ALARA review contained, among other things, the following surveillance requirements:

- Surveys per RWP/GRCS (Group Radiological Controls Supervisor)
- Survey transfer lines after flushing
- AMS-3 constant air monitor
- Other air samples per RWP/GRCS

The ALARA review also required a pre-job briefing to discuss the following:

- Contents of the procedure governing the operation
- Surveys
- Chemistry sampling
- Radiological controls coverage requirements during each phase of the process
- Source of resin

The expected radiological conditions, according to the ALARA review, were such that the exposure rates could be as high as 10 R/hr contact in unshielded areas. Areas of concern in this regard were given as the transfer lines during and immediately after transfer, and the unshielded areas on top of the shielded shipping cask. The ALARA review noted that the recommended method to predict the radiation levels to expect from the resin is by considering the type of resin, that is, the system from which it came. It points out that the reactor cleanup resin is expected to be more radioactive than condensate demineralizer resins.

Based on interviews and written statements by the licensee personnel involved in the incident, the reactor cleanup resin in the New Radwaste (NRW) building storage tank on December 5, 1986, caused the area radiation monitor in the tank room to alarm setpoint. The monitor reading was 50-60 R/hr. That reading dropped to 30 R/hr after the resin was transferred from the tank to the cask. These readings were considered by the radwaste operators to be somewhat high but not particularly unusual for reactor cleanup resin. The contact exposure rate at the fill head after resin transfer to the shipping cask was measured on December 5, 1986 to be 3.5 R/hr. This was also considered typical for a cleanup resin load.

According to the written statements and interviews with licensee personnel, the Radiological Controls technician (RCT) covering the work on the morning of December 8, 1986, was informed by his supervisor that the expected exposure rate was 7-15 R/hr. The supervisor contested this statement and maintained that he did not tell the technician what dose rates to expect, except that the fill head was reading 3.5 R/hr on contact. Written statements by licensee personnel also indicated that the RCT was informed by a radwaste supervisor that the expected exposure rate may be as high as 20-25 R/hr. This was contested by the RCT, who claimed that he was not so informed. The radwaste supervisor's statement was corroborated by one of the radwaste technicians.

A pre-job briefing was held on the morning of December 8, 1986 to discuss the upcoming work. The briefing was attended by the RCT, the two Chem Nuclear Technicians who performed the work, and a radwaste crane operator. Following the briefing, the RCT surveyed the area and found an exposure rate of 600 mR/hr at the top of the cask. The fill head was then removed and surveyed, a resin sample taken, and the head bagged. The contact reading on the fill head at that time was 350 mR/hr. The liner was then capped by one of the Chem Nuclear technicians standing on top of the cask shield. He was assisted by the second technician standing on a ladder placed against the side of the cask. The RCT stood on a second ladder and performed a survey of the hole in the shield while liner capping was in progress. The exposure rate of over 40 R/hr was discovered at that time, but the job had already been completed. The radiation field was high enough to put the Chem Nuclear technician over his administrative limit.

5.0 Findings

An apparent factor that resulted in the administrative limit being inadvertenly exceeded was a failure to survey the radiation field prior to entering that field. This is an apparent violation of 10 CFR Part 20 requirements
(50-219/86-41-01). The radiological controls technician (RCT) covering the job surveyed the radiation field while the job was in progress, rather than before the radwaste technician got on top of the cask shield. Due to the high radiation field, there was insufficient time for the RCT to stop work before the administrative exposure limit was exceeded.

A review of the sequence of events preceding the job, as well as the paperwork connected with the job, revealed that there were several important factors that appeared to have contributed to the incident. The monitoring requirements specified on the RWP for the job included monitoring at start of job and intermittent monitoring. However, the RWP covered the entire resin transfer and dewatering operation, which consists of several distinct phases, with significantly variable radiological hazards, and spanning several days. The inspector discussions with several RCTs indicated that the requirement to survey at the start of job was ambiguous under such conditions since the job involved several distinctly different phases. The requirement for intermittent surveys was

also difficult to determine. Interviews with site radiological controls technicians, supervisors, and managers revealed that there was no uniformly accepted and clearly defined interpretation of "start of job" or "intermittent". Although this may be an appropriate method of specifying survey frequencies, individuals involved were not clearly instructed as to the radiological hazards and significant hold points associated with the job. In the case of the cask incident, the technician assigned to the job, although experienced as a radiological controls technician, was unfamiliar with the liner/cask job he was assigned to cover. Furthermore, he was not instructed on job-specific considerations for appropriate hold points for surveys. The ALARA review attached to the RWP did not discuss these considerations, but referred the reader to instructions on the RWP and the Group Radiological Controls Supervisor (GRCS). The procedures did not specify any hold points. Also, the radwaste technicians were not instructed to wait until a survey was conducted before approaching the unshielded opening on top of the cask. These failures to instruct the radiological controls and radwaste technicians constitute an apparent violation of the requirements of 10 CFR Part 19 (50-219/86-41-02).

6.0 Exit Interview

The inspectors met with the personnel denoted inspection 1.0 at the conclusion of the inspection on December 19, 1986. The scope and findings of the inspection were discussed at that time.