

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 50-293/79-23

Docket No. 50-293

License No. DPR-35 Priority -- Category C

Licensee: Boston Edison Company M/C Nuclear

800 Boylston Street

Boston, Massachusetts 02199

Facility Name: Pilgrim Nuclear Power Station

Inspection at: Plymouth, Massachusetts

Inspection conducted: December 27-28, 1979 and January 4, 1980

Inspectors: P. Clemons
P. Clemons, Radiation Specialist

1/10/80
date signed

P. Clemons for
C. Gallina, Investigation Specialist

1/10/80
date signed

_____ date signed

Approved by: H. W. Crocker
H. W. Crocker, Acting Chief, Radiation Support
Section, FF&MS Branch

1/10/80
date signed

Inspection Summary:

Inspection on December 27-28, 1979 and January 4, 1980 (Report No. 50-293/79-23)

Areas Inspected: Special unannounced inspection by two regional based inspectors of the licensee's discrepant radioactive waste shipment to Barnwell, S.C. on December 14, 1979 including: records of shipments, review of procedures, chronology of events, and regulatory requirements.

Results: Of the four areas inspected, no items of noncompliance were identified in three areas. One apparent item of noncompliance was identified in one area (Violation - failure to comply with 49 CFR 173.393(j)(3) - paragraph 2).

DETAILS

1. Persons Contacted

Principal Licensee Employees

- Mr. J. Crowder, Chemistry and Radiation Protection Technician
- *Mr. M. Hensch, Chief, Radiological Engineer
- *Mr. C. Mathis, Methods Training and Group Leader
- *Mr. P. McGuire, Station Manager
- *Mr. R. Schuler, Engineer
- Mr. P. Tache, Health Physics Supervisor
- *Mr. R. Trudeau, Health Physics Senior Engineer
- *Mr. C. Vantrease, Acting Station Manager

The inspector also interviewed other licensee employees during the course of the inspection. They included a Senior Radiation Protection Engineer, a Health Physics Supervisor, an ALARA Engineer and a Chemistry and Radiation Protection Technician.

*Denotes those present at the exit interview.

2. Discrepant Shipment

10 CFR 71.5, "Transportation of licensed material" states "no licensee shall transport any licensed material outside of the confines of his plant or other place of use, or deliver any licensed material to a carrier for transport, unless the licensee complies with the applicable requirements to the regulations appropriate to the mode of transport, of the Department of Transportation in 49 CFR Parts 170-189..."

49 CFR 173.393, "General packaging and shipment requirements" states "Unless otherwise specified, all shipments of radioactive materials must meet all requirements of this section..."

49 CFR 173.393(j)(3) limits the dose rate from licensed radioactive material to ten millirem per hour at any point 2 meters (six feet) from the vertical plane projected by the outer lateral surfaces of the car or vehicle consigned for exclusive use.

On December 14, 1979 the licensee shipped licensed radioactive material to the burial site at Barnwell, South Carolina. The shipment consisted of an exclusive use closed van which contained two "Liners" and twelve boxes of compacted solid waste. Upon receipt of the material at Barnwell, representatives of the State Bureau of Radiological Health of South Carolina proceeded to survey the van. Measurements were made at the surface of the van, in the cab of the van and at a measured distance of

six feet from the surface of the van. The survey results at the surface of the van and in the cab of the van indicated the dose rates were within acceptable limits. The survey results at the six foot distance exceeded the Department of Transportation (DOT) limits. At this distance a dose rate of 17 mr/hr was detected by the representatives of the South Carolina Bureau of Radiological Health. The two representatives of South Carolina performing the survey were qualified health physicists, using calibrated instruments. It was noted that failure to comply with the DOT regulations represents noncompliance. (79-23-01)

3. Chronology of Events

On December 18, 1979, South Carolina officials informed the NRC State Agreements program of a shipment from Boston Edison arriving at the Barnwell site which exceeded permissible radiation levels on the exterior of the truck. The truck arrived on site on December 17, 1979.

On December 27, 1978, a Region I inspector was sent to the Pilgrim site to investigate the matter. The following information was learned by the inspector.

On December 14, 1979 at approximately 7:00 p.m. the Chem Nuclear van, containing the twelve boxes and two "Liners", was surveyed by a Boston Edison technician. He selected a RO-2A and started his survey and he noticed that the instrument was erratic. He then selected a second RO-2A, Serial No. 273, which appeared to be operating properly, and proceeded to perform the survey. The Radioactive Shipment Record, RSR No. 79-182 indicated the following survey data recorded by the technician:

- a) Maximum radiation in back of cab: <1 mrem/hr
- b) Maximum radiation level at edge of vehicle: 140 mrem/hr
- c) Maximum radiation level 6 feet from edge of vehicle: 10 mrem/hr

The survey data obtained at the 6 foot distance (estimated) was confirmed by the technician's supervisor who observed the readings as the survey was performed at the 6 foot distance. The Supervisor signed the Radioactive Shipment Record as required, and then he left the site.

Shortly thereafter the Chem Nuclear truck driver performed his survey using a Ludlum survey meter. At the six foot distance (estimated) the driver measured 19 mrem/hr. The truck driver informed the Boston Edison representative that he could not accept the shipment because it exceeded regulatory limits at the six foot distance. At this time the Boston Edison Radwaste Engineer asked the technician if he was confident of the 10 mrem/hr

reading that he had measured at the six foot distance, and the technician replied that he was confident.

The Radwaste Engineer then proceeded to contact Chem Nuclear officials at Barnwell to resolve the difference in the two readings. According to the Radwaste Engineer, the Chem Nuclear official at Barnwell asked if the RO-2A, Serial No. 273, was in calibration, and when informed that it was, he told the Boston Edison Radwaste Engineer to use the RO-2A data because he was not certain of the calibration status and reliability of the Ludlum instrument used by the Chem Nuclear truck driver.

As this conversation was going on the Boston Edison technician selected a Teletector survey meter and performed another survey at the six foot distance (estimated). The technician measured 19 mrem/hr at the same location as found by the truck driver. The technician informed the Radwaste Engineer of the latest survey information, and he also told the Engineer that he had little faith in the reliability of the Teletector at low dose rate levels. The Radwaste Engineer told the technician that the issue had been resolved by the Chem Nuclear representative, and they could proceed with the shipment. The truck left the Pilgrim site at 8:15 p.m. on December 14, 1979.

On Monday, December 17, 1979, the shipment was received at Barnwell where it was monitored by representatives of the State of South Carolina and Chem Nuclear. According to a representative of the State, the dose rate measurer at six feet was 17 mrem/hr as noted by both parties. Boston Edison was then notified of the discrepant shipment.

Boston Edison sent two representatives to Barnwell on December 17, 1979, the purpose being to confirm the measurements made at Barnwell by Chem Nuclear and the State of South Carolina.

On December 18, 1979 Boston Edison personnel met with representatives of Chem Nuclear, South Carolina and the NRC, and with a variety of instruments, (Boston Edison used the RO-2A, Serial No. 273), all made individual surveys and according to the Boston Edison representative all results were in good agreement, 15-17 mrem/hr at six feet.

On December 18, 1979, the State of South Carolina informed Boston Edison that they could not ship anymore radioactive waste to the Barnwell site.

On December 20, 1979, representatives of Boston Edison met with representatives of the Office of the Attorney General of the State of South Carolina at which time Boston Edison presented revised procedures that should prevent recurrence of the discrepant shipment.

On January 8, 1979 the inspector was informed by a representative of South Carolina that Boston Edison could resume shipping radioactive waste to Barnwell as of that date.

4. Exit Interview

The inspector met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on January 4, 1980. The inspector summarized the purpose and the scope of the inspection, and the findings as presented in this report.