

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 99990002

License No.: 110-27

Report No.: 9990002/96-09

Licensee: Edlow International Company

Facility Name: Charleston Naval Weapons Station

Location: Charleston, South Carolina

Date: September 22, 1996

Inspector: William J. Tobin, Senior Safeguards Inspector
Jay L. Henson, Health Physicist

Approved by: Edward J. McAlpine, Chief
Fuel Facilities Branch
Division of Nuclear Materials Safety

Enclosure

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EXECUTIVE SUMMARY

Safeguards/Security

- Prior notification to the NRC and to the State of South Carolina was in accordance with the regulations.
- The licensee complied with NRC criteria relative to armed escorts, redundant communications capabilities, immobilization equipment and procedures.
- The inspector noted particular attention was given to the protection of Safeguards Information.
- This Shipment was inspected at the Point of Entry and randomly surveilled by the NRC until reaching the Savannah River Facility.

Radiological Controls

- The licensee uses information supplied by the reactor staff at the point of origin to complete the shipping papers for each cask. This information is not always independently verified by the licensee, and as a result, the licensee's documents included minor errors on some of the shipping papers. The licensee corrected these errors during the inspection.
- The dose rates measured around the rail cars and the levels of removable contamination measured from the freight containers were well below the regulatory limits.
- The shipment was conducted in accordance with NRC and DOT requirements.

Attachment:

Persons Contacted and Exit Meeting

REPORT DETAILS

II. SAFEGUARDS

S2. Physical Protection of Shipments of Irradiated Fuel (IP 81310)

a. Inspection Scope

The inspector reviewed the licensee's program, performance and procedures for adherence to its Plan for the Physical Protection of Foreign Research Reactor Fuel in Transit, Revision 2 dated October 13, 1995. This Plan implements the requirements of 10 CFR Part 73.37, titled, "Requirements for physical protection of irradiated reactor fuel in transit."

b. Observations and Findings

By letter dated August 1, 1996, the licensee notified the NRC and the designated representative of the Governor of South Carolina of the impending shipment of irradiated fuel through the Charleston Naval Weapons Station to the Savannah River Facility. This "Safeguards Information" document disclosed the schedule, description of the cargo, anticipated route and the security arrangements for shipping through the heavily populated area of Charleston, S.C.

Additional correspondence, dated August 2, 1996, to the NRC requested Region 2 to perform a survey of the port and a small portion of the rail route prior to subsequent approval. That survey was completed on August 28, 1996.

On September 22, the fuel was offloaded from two ships and placed aboard CSX railcars. The shipment was escorted by members of the South Carolina Highway Patrol and the South Carolina Law Enforcement Department. An additional escort accompanied the shipment from a nearby CSX Police vehicle.

Prior to departure the inspector witnessed the successful tests of the redundant communication capabilities located in various locations of the train. Emergency and contingency procedures addressed such events as vehicle accidents, rerouting, hostage attempts and other appropriate topics. These procedures were adequately known to the escorts.

The inspector witnessed the departure of the CSX railcars, communicated several times during the shipment with the DOE Emergency Center relative to the location of the shipment, and was present as the shipment completed the trip through Hampton and Barnwell Counties. The inspector witnessed the presence of State and County law enforcement officials at railroad crossings and sidings to assist in the expeditious movement of the train.

The shipment left the Charleston area at approximately 1PM and arrived at the Savannah Site at about 6PM.

c. Conclusion

The shipment was conducted in compliance with NRC criteria. With respect to the presence of armed escorts throughout the shipment, NRC requirements were exceeded. Personnel were familiar with the equipment to stop the train under emergency conditions. Safeguards Information documentation was well marked and secured as appropriate.

III. Radiological Controls

R1. Inspection of Transportation Activities (IP 86740)

a. Inspection Scope

The inspector reviewed the licensee's program, performance and procedures for adherence to the requirements of 10 CFR Part 71, Packaging and Transportation of Radioactive Material and Department of Transportation requirements described in 49 CFR parts 170 through 189. Due to the nature of the inspection, the inspector was limited to the review of shipping papers, observations of the loading and marking of freight containers, and performing radiological surveys of the freight containers to determine compliance with dose rate and removable contamination limits.

b. Observations and Findings

The licensee shipped eight casks containing spent fuel elements with activities ranging from 45 to 120,243 curies per cask. Prior to shipment from overseas, each cask was placed in a separate, sealed freight container designed to be easily secured to a flat rail car. Two freight containers were loaded per flat car, and an empty flat car was positioned to separate the engine and the caboose from the leading and trailing flat cars that carried the freight containers. The spent fuel casks were shipped as an "exclusive use" shipment.

The inspector examined the shipping papers prepared for each cask in compliance with 49 CFR 172.200 through 205. The inspector noted that the activity indicated for cask number GNS 7000 was 1,755 PBq (4.74 E^7 curies) and for number 203650 was 4,449 PBq (1.20 E^8 curies). The inspector asked an Edlow representative if those activities were correct and the representative determined that the correct activities were 1,755 PBq (4.74 E^4 curies) and 4,449 PBq (1.20 E^5 curies). The Edlow representative corrected the activity entries on the shipping papers for these casks.

After the freight containers were loaded on the flat cars, the inspector examined them for compliance with the placarding requirements of 49 CFR 172.500 through 519. Each freight container was clearly placarded on all four sides with the required radioactive placard. The inspector was unable to examine the fuel casks contained in each freight container to

determine compliance with the package marking and labeling requirements. However, the inspector did note that some of the freight containers were labeled and marked with the designation UN 2918. A summation of the markings and labelings on each freight container is provided in the following table:

Freight Container No.	Label	Marked UN 2918
850013	None	No
850014	None	No
7000	Yellow III	Yes
7000-02/6	Yellow II	Yes
29707I-0	Yellow III	Yes
203650	Yellow III	Yes
266230	Yellow III	Yes
297279-4	Yellow III	Yes

The inspector noted that the shipping papers for freight container number 7000-02/6 indicated that it was labeled with a Yellow III label but that the label on the container was a Yellow II label. The inspector asked an Edlow representative which label was correct and the representative determined that the Yellow II was correct. The representative corrected the shipping papers to indicate that the package was labeled with a Yellow II label. The inspector also noted that the activity level indicated on the shipping papers for freight container numbers 29707I-0 and 297279-4 did not match the activity level indicated on the labels placed on these containers. The Edlow representative reviewed the documentation for these containers and corrected either the shipping papers or labels as appropriate to indicate the correct activity.

A further discrepancy that was noted and discussed with the licensee during the Exit Meeting was the designation of "Highway Route Controlled Quantity" (HRCQ) on the shipping paper for each cask. If the cask in freight container number 7000-02/6 did contain a HRCQ, then it is required by 49 CFR 172.403(c) to be labeled with a Yellow III label, instead of the Yellow II label which appeared on the container.

The inspector asked the Edlow representatives how the information on the shipping papers was determined. The representatives responded that they depended on the reactor staff in the country of origin to supply information such as the activity, transport index, labels and markings that apply to each cask and corresponding freight container. The inspector asked if this information is verified by Edlow representatives at the country of origin prior to shipment or by some other means to ensure its accuracy. The Edlow representatives responded that some of

the casks are examined prior to shipment and the information verified at the loading site, but that not all are examined to verify this information.

The inspector also conducted surveys of each freight container to determine if the shipment complied with the radiation level limits in 49 CFR 173.441. The casks were transported by exclusive use rail and each cask was placed in individual, sealed freight containers that served to make the conveyance a closed transport vehicle. Since the casks were in sealed freight containers and were in a "transit mode" from the overseas shipment origination point to their final destination, the inspector did not have access to the casks. Therefore, the inspector did not have access to the radioactive material packages for this shipment and no surveys of the package surfaces were performed.

The inspector used an Eberline RO-2 survey meter (S/N: 607) to measure the dose rate at the edge of each flat car and at 2 meters from the edge. The background radiation level was less than or equal to 0.1 millirem/hr. The measured dose rates at the edge of the rail cars ranged from background levels to 0.6 millirem/hr. The measured dose rates at 2 meters from the edge of the flat cars ranged from background levels to 0.4 millirem/hr. The measured dose rates in the caboose and at the area where the engine would be attached to the train were ranged from background levels to 0.2 millirem/hr. Based upon the survey, the inspector determined that the shipment did not exceed the vehicle outer surface radiation level limits of 200 millirem/hr, the 10 millirem/hr limit at 2 meters from the rail car edge, and the 2 millirem/hr limits in the occupied spaces of the train engine and caboose.

Since the inspector did not have access to the radioactive material packages, the inspector could not determine the level of removable radioactive contamination on the external surfaces of each package. However, the inspector did obtain four wipes from the exterior surfaces of each freight container near any openings (doors, hatches, vents, etc.) into the containers. The 100 cm² contamination wipes were counted for one minute with an Eberline ESP-2 instrument in the scaler mode with an Eberline HP-260 "pancake" detector. The results of the contamination wipe counts ranged from less than the instrument background count to a maximum of 85 dpm (all were less than two times the instrument background count rate of 42 cpm).

c. Conclusion

Although the licensee made minor errors on some of the shipping papers, these errors were corrected during the inspection, and the shipment was conducted in compliance with NRC and DOT criteria.

ATTACHMENT

1. PERSONS CONTACTED

1.1 Licensee Personnel

- * F. Oshinowo, Transportation Coordinator
- * N. Ravenscroft, Vice President

1.2 Other Personnel

W. Clark, DOE Project Manager
J. Lay, Federal Railroad Administration Inspector
S. Poelker, U.S. Navy Commander
T. Tehan, VECTRA Contractor

Additional individuals contacted included ships and harbor personnel, law enforcement officials, DOE emergency response authorities and U.S. Navy officers.

1.3 NRC Personnel

- * J. Henson, Health Physicist
- * W. Tobin, Senior Safeguards Inspector

* Denotes those in attendance at the telephonic Exit Meeting.

2. Exit Meeting

The Exit Meeting was held telephonically on September 24, 1996, with those so noted above in attendance. The inspector summarized the scope and findings of this inspection. The need for increased attention to the accuracy of shipping documentation and records was discussed as is reflected in paragraph III of this Report. No dissenting comments were expressed. The licensee agreed to inform the NRC of it's efforts to improve the accuracy of records in future shipments.