

**Babcock & Wilcox**

Research & Development Division  
Lynchburg Research Center

P. O. Box 11165  
Lynchburg, Virginia 24506-1165  
(804) 522-6000

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August 28, 1985

U. S. Nuclear Regulatory Commission  
Region II  
101 Marietta Street, NW  
Atlanta, Georgia 30323

Attention: Mr. J. Phillip Stohr, Director  
Division of Radiation Safety and Safeguards

Gentlemen:

SUBJECT: REPORT NOS. 70-824/85-05 AND 50-013/85-01

My responses to the Notice of Violation, dated July 29, 1985,  
and the subject report, are attached.

If you have any questions in this regard, please contact Mr.  
Olsen, Senior License Administrator, at (804) 522-5174.

Very truly yours,  
BABCOCK & WILCOX

*T. C. Engelder*  
T. C. Engelder, Director  
Lynchburg Research Center

/jgh

Attachment

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PDR ADOCK 05000013  
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*TEO 11*

## 1. VIOLATION

The licensee failed to package a shipment of LSA radioactive material in a DOT Specification 7A Type A package or a strong tight package in that on May 7, 1985, Shipment No. LRC-23 arrived at the burial facility, and a hole was found in one drum.

### 1.1 Admission or Denial of the Alleged Violation

As explained in the information below, I am unable to admit or deny the violation. In view of this, I request that the level of violation be reduced to a Level V.

### 1.2 Reasons for the Alleged Violation

Shipment No. LRC-23 was received at the U.S. Ecology facility on May 6, 1985. On May 7, 1985, the LRC was notified by telephone that Drum No. 4740 was found to have been punctured. According to our loading scheme, this drum was located in the fourth row from the front of the trailer, the second from the left side of the trailer, and on the top tier.

The Manager of Facilities and a Senior Health Physics Technician went to the U.S. Ecology facility at Richland, Washington. They arrived on site the day after notification, viewed the drum, and photographed the damage. They requested that the drum be returned to the LRC to enable us to perform an autopsy on it.

Drum No. 4740 was opened after its return to the LRC and its contents removed. The object that caused the puncture was found to be a small steel object rigidly attached to a six-inch I-beam which was loaded adjacent to the inside surface of the drum. An examination of the hole indicated that the steel object was driven through the wall by an impact, probably a single event. There was no evidence of wearing or scraping on the interior of the drum in the vicinity of the hole. Dents in the bottom chime and the bottom surface of the drum were also observed.

Three individuals inspect each container of waste that is sent to the U.S. Ecology facility prior to the shipment. These inspections are conducted during the loading operation, with the final inspection being performed inside the truck after the container is in its final position. In the case of Shipment No. LRC-23, these inspections were conducted by a Senior Health Physics Technician, a Health Physics Engineer, and the Quality Assurance Administrator. After the notification that a punctured drum was found on Shipment No. LRC-23, these three individuals were interviewed and each described his method of inspection. The final inspector was the Health Physics Engineer who described his inspection to have been visual and that he also ran his hands around the outside surface of each container. Each of the inspectors described the condition of the containers as being in a proper condition for shipment. Records of the inspection indicate minor conditions such as small areas of rust and dents. This record states that the condition of No. 4740 was "good" and no deficiencies were noted. It is our conclusion that Drum No. 4740 was in proper condition for transportation.

August 28, 1985

Page 2

A study was performed by the Supervisor, Failure Analysis. The Failure Analysis section is a separate part of the LRC organization whose business is failure analysis and is not involved in shipping. The study included the conduction of tests on containers similar to the one that was found to have been punctured. These tests duplicated the total drum weight, internal configuration of the steel object and I-beam, and the construction and material of the punctured drum. The purpose of the tests was to duplicate, as closely as possible, the hole and the bottom chime dents that were observed in Drum No. 4740. The damage was duplicated when a test drum was dropped from a height of three feet with the vertical axis of the drum inclined at an angle of 19-degrees from the horizontal. U.S. Ecology noted no deficiency in the bracing of the contents of Shipment No. LRC-23 and stated that Drum No. 4740 had apparently not moved from its loaded position prior to receipt and that no other containers in the shipment were damaged.

The LRC contacted the DOT to verify our understanding of the term "normally incident to transportation." This phrase is used to describe transportation conditions that should be assumed when a container is selected to serve as a Strong Tight Package. According to the DOT, these conditions are normal acceleration, vibration, and vibration resonance that can be expected during transportation. A wreck of the vehicle or a drop of a container from a height of three feet is not considered by DOT to be normal conditions of transportation. The driver of the Tri-State Motor Transit Company vehicle that transported Shipment No. LRC-23 from the Lynchburg Research Center to the U.S. Ecology facility was interviewed by telephone. He stated that he experienced no unusual conditions of the roads nor in the performance of the vehicle during the transport of Shipment No. LRC-23. The dispatcher of the transport company verified the driver's report.

The conclusions of the investigation were that the puncture in Drum No. 4740 did not occur prior to its shipment, and that the puncture was not caused by conditions normally incident to transportation.

1.3 Corrective Steps Which Have Been Taken and the Results Achieved

No action, after the fact, would correct this occurrence.

1.4 Corrective Steps Which Will be Taken to Prevent Further Violations

Our action to prevent a recurrence of this type of incident will be to exercise great care in the loading of waste into containers so that sharp heavy objects are prevented from coming in direct contact with the container walls.

1.5 The Date When Full Compliance Will be Achieved

No shipments of waste have been made since this incident occurred. When such a shipment is necessary, it will be performed in full compliance.

2a. VIOLATION

On May 1, 1985, the licensee shipped Fissile Class II material in six packages designated by the licensee to be DOT Specification 7A Type A packages without having performed the free drop test.

2a.1 Admission or Denial of the Alleged Violation

I admit to this violation.

2a.2 Reasons for the Alleged Violation

The requirement to perform drop tests for Fissile Class II packages specified in 49 CFR 173.465(c)(3) that are in addition to the normal tests for a 7A Type A container was overlooked.

2a.3 Corrective Steps Which Have Been Taken and the Results Achieved

The shipment of Fissile Class II packages has been suspended until a checklist containing all of the requirements for such shipments and packages is developed. No shipments of Fissile Class II packages have been made.

2a.4 Corrective Steps Which Will be Taken to Prevent Further Violations

A pre-shipment checklist that specifies all of the requirements of Fissile Class II packages and shipments will be developed.

2a.5 The Date When Full Compliance Will be Achieved

Shipments of Fissile Class II packages are performed very infrequently at the LRC, and none are presently scheduled. When such a shipment is necessary, it will be performed in full compliance.

2b. VIOLATION

On August 21, 1984, the licensee shipped special nuclear material in a package that had a crack approximately four-inches long under the weld of a closure device.

2b.1 Admission or Denial of the Alleged Violation

I deny this violation for two reasons:

- A. The crack in the Ratchet Binder Bracket of the MO1 shipping container constitutes a superficial mark which is permitted under the regulations, and
- B. LRC met all five tests specified in 10 CFR Part 2, Appendix C, for this issue not to be reported in the Notice of Violation.

It is not clear in the Notice of Violation what portion of 10 CFR 71.87 it is contended that we have violated. In the inspector's report the following conclusion is given: "Failure to ensure that the closure device on a package of special nuclear material was free of defects prior to shipment was identified as another example of an apparent violation of 10 CFR 71.87." It would appear that this example refers to Section 71.87(c).

A. In our discussion of this item at the June 27, 1985 enforcement conference, we questioned that the crack in the lower ratchet binder weld constituted a defect as the term is used in the regulation. Certain defects are permitted under 71.87(b) and our evaluation revealed that the crack was superficial for two reasons:

1. The safety analysis of the container, which is found in Application for Renewal of Certificate of Compliance No. 9069, Docket 71-9069, October 30, 1981, makes the assumption that only the top weld of the Ratchet Binder Brackets are effective for each of the conditions analyzed. The analyses demonstrate the structural integrity of the container under various accident conditions. Our investigation revealed that, with one failed weld out of four holding one bracket (there are 24 brackets on the M01 container), the container's performance during the hypothetical accident conditions would not be decreased. Mr. John Olivadoti, NUPAC, the designer and fabricator of the M01 container, confirmed that:
  - a. Only the top attachment weld on each ratchet binder bracket was assumed to be effective for the purpose of determining the lid retention capability of the M01 package closure system.
  - b. This assumption was consistently applied throughout the analysis of each accident scenario.
  - c. The weld region affected by the crack was not part of the weld region assumed to be effective in the safety analysis.

It was his opinion that the observed crack had no safety significance with respect to the lid retention capability.

2. Our evaluation also revealed that the crack in the ratchet binder weld did not affect the integrity of the container, in that it was not a through wall crack. This conclusion was concurred with in the NRC inspection report.



B. We presented evidence at the June 27, 1985 enforcement conference that demonstrated that the LRC took prompt and aggressive action upon discovery of the condition. We identified the problem, reported the event to the Transportation Certification Branch in accordance with Part 71.95, immediately removed the container from service, developed a Quality Assurance Plan for the repair of the container, repaired the container in accordance with the Plan using materials and techniques that were recommended by the container's manufacturer — even to the point of bringing in a certified welder and an inspector from Ohio — and increased the surveillance program for the receipt and shipment of these containers. This item should not have been listed in the Notice of Violation because the LRC met the five tests that are specified in the Enforcement Policy.

### 3. VIOLATION

The requirement in the U.S. Ecology license to display the waste classification label near each DOT label was not met, in that, on May 1, 1985, six drums were transferred to the U.S. Ecology Low-Level Waste Disposal Facility with two DOT Yellow II labels but only one waste classification sticker affixed to each drum.

#### 3.1 Admission or Denial of the Alleged Violation

I admit to this violation.

#### 3.2 Reasons for the Violation

The requirement in the U.S. Ecology license was left out of the waste shipment checklist and was overlooked by the individual that applied the labels to the containers.

#### 3.3 Corrective Steps Taken and Results Achieved

The shipment of other than LSA material to the U.S. Ecology has been suspended until a checklist containing all of the requirements for these other types of materials can be developed. No shipments have been made to U.S. Ecology.

#### 3.4 Corrective Steps Which Will be Taken

Preshipment checklists for each type of material to be shipped to U.S. Ecology will be developed.

#### 3.5 The Date When Full Compliance Will be Achieved

No shipments have been made to U.S. Ecology since this incident occurred. When one is made, it will be in full compliance with the regulations.