

April 18, 2001

MEMORANDUM TO: Ledyard Marsh, Chief
Events Assessment, Generic Communications and
Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

FROM: Marvin M. Mendonca, Senior Project Manager */RA/*
Events Assessment, Generic Communications and
Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

SUBJECT: PREDECISIONAL ENFORCEMENT CONFERENCE SUMMARY

Licensee: Texas A&M University

Facility: Nuclear Science Center (NSC) Research Reactor

Enforcement Action No.: EA-01-029

On March 29, 2001, representatives of the Texas A&M University met with NRC personnel at the NRC's One White Flint Office in Rockville, Maryland, to discuss the apparent violations identified in NRC's Inspection Report N 50-128/2000-202. The conference was held at the request of the NRC staff.

The licensee presented a summary of the causes for the apparent violations and their corrective actions. The licensee agreed with the NRC staff's apparent violations.

The agenda, the attendance list, the NRC staff's presentation, and the licensee's presentation are attached to this summary.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this summary and its enclosures will be made available to the Public.

Docket No.: 50-128
License No.: R-83

Attachments:

1. Agenda
2. Attendance List
3. NRC staff's Presentation
4. Licensee's Presentation

Texas A&M University System

Docket No. 50-128

cc:

Texas A&M University System
ATTN: Dr. Warren D. Reece, Director
Nuclear Science Center
Texas Engineering Experiment Station
F.E. Box 89, M/S 3575
College Station, TX 77843

Texas State Department of Health
Radiation Control Program Director
Bureau of Radiation Control
1100 West 49th Street
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Test, Research, and Training
Reactor Newsletter
202 Nuclear Sciences Center
University of Florida
Gainesville, FL 32611

U.S. Customs Service
Safety Branch
ATTN: Mr. Rick Whitman
6026 Lakeside Boulevard
Indianapolis, IN 46278

U.S. Department of Transportation
Mr. Raymond Lamagdelaine, Special
Investigations Chief
Office of Hazardous Materials Enforcement
DHR-40
400 7th Street, S.W.
Washington, DC 20590

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ADAMS ACCESSION NO: ML011000225

TEMPLATE #: NRR-106

*Please see previous concurrence

OFFICE	REXB:PM		REXB:LA		REXB:BC	
NAME	*MMendonca:rdr		*EHylton		LMarsh	
DATE	04/ 10 /2001		04/ 10 /2001		04/ 11 /2001	

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PREDECISIONAL ENFORCEMENT CONFERENCE AGENDA

CONFERENCE WITH TEXAS A&M UNIVERSITY

MARCH 29, 2001

U.S. NUCLEAR REGULATORY COMMISSION

ONE WHITE FLINT NORTH, CONFERENCE ROOM O-4-B-6

1. INTRODUCTIONS & OPENING REMARKS - David B. Matthews, Director, Division of Regulatory Improvement Programs, Office of Nuclear Reactor Regulation
2. ENFORCEMENT PROCESS - T. Reis, Acting Enforcement Coordinator, Office of Nuclear Reactor Regulation
3. APPARENT VIOLATIONS & REGULATORY CONCERNS - Ledyard B. Marsh, Chief, Events Assessment, Generic Communications and Non-Power Reactors Branch, Division of Regulatory Improvement Programs, Office of Nuclear Reactor Regulation
4. LICENSEE PRESENTATION - G. Williams, Assistant Director, Texas Engineering Experiment Station; D. Reece, Director, Nuclear Science Center
5. NRC STAFF CAUCUS (APPROXIMATELY 10 MINUTES)
6. RESUMPTION OF CONFERENCE
7. CLOSING REMARKS - LICENSEE - G. Williams, Assistant Director, Texas Engineering Experiment Station; D. Reece, Director, Nuclear Science Center
8. CLOSING REMARKS - NRC STAFF - David B. Matthews, Director, Division of Regulatory Improvement Programs, Office of Nuclear Reactor Regulation

Attendance List

NRC Staff Attendees:	D. Matthews, Director, Division of Regulatory Improvement Programs L. Marsh, Chief, Events Assessment, Generic Communications and Non-Power Reactors Branch (REXB), NRR M. Mendonca, Senior Project Manager, REXB, NRR S. Holmes, Reactor Inspector, REXB, NRR T. Reis, Acting Enforcement Coordinator, Office of Nuclear Reactor Regulation (NRR) C. Nolan, Enforcement Specialist, Office of Enforcement B. Smith, Enforcement Coordinator, Office of Nuclear Materials Safety and Safeguards J. Wiggington, Senior Radiation Specialist, NRR A. Adams, Senior Project Manager, REXB, NRR J. Peralta, Acting Technical Assistant, NRR See-Meng Wong, Risk Analyst, NRR R. Benedict, Senior Reactor Systems Engineer, REXB, NRR
Licensee Attendees:	G. Williams, Assistant Director, Texas Engineering Experiment Station D. Reece, Director, Nuclear Science Center
Department of Transportation:	M. Sampson, Program Manager, Radioactive Materials Enforcement

NRC Staff's Presentation

APPARENT VIOLATIONS

PREDECISIONAL ENFORCEMENT CONFERENCE

TEXAS A&M UNIVERSITY NUCLEAR SCIENCE CENTER RESEARCH REACTOR

March 29, 2001

THE APPARENT VIOLATION DISCUSSED AT THIS PREDECISIONAL ENFORCEMENT CONFERENCE ARE SUBJECT TO FURTHER REVIEW AND MAY BE REVISED PRIOR TO ANY RESULTING ENFORCEMENT ACTION

December 8 Event First Apparent Violation

10 CFR 71.5 Transportation of licensed material requires that each licensee who transports licensed material outside the site of usage, or transports on public highways, or who delivers to a carrier for transport, shall comply with the applicable requirements of the DOT regulation in 49 CFR parts 170 through 189 as appropriate.

Contrary to this requirement, the licensee delivered to a carrier for transport a package not in compliance with 49 CFR 173.475 Quality control criteria since the package was not closed as required by the manufacture's certification, in that the container's restraining "T" bar was not secured as described in the packaging instructions. Failure to follow applicable DOT regulations is a violation of 10 CFR 71.5.

THE APPARENT VIOLATION DISCUSSED AT THIS PREDECISIONAL ENFORCEMENT CONFERENCE ARE SUBJECT TO FURTHER REVIEW AND MAY BE REVISED PRIOR TO ANY RESULTING ENFORCEMENT ACTION

December 8 Event Second Apparent Violation

49 CFR 171.8 defines a hazmat employer and employee while 49 CFR 172.702 delineates the applicability and responsibility for training, and 49 CFR 172.704 the training and record keeping required for such training provided by the employer.

Contrary to 49 CFR 172.702, the licensee (a hazmat employer) did not provide hazmat training for the reactor operations employees (hazmat employees) involved in the December 4, 2000, shipment. The employees loaded radioactive material into the shipping package and/or performed the final reinstallation of the shield lid and locking "T" bar. This is an apparent violation of 10 CFR 71.5.

THE APPARENT VIOLATION DISCUSSED AT THIS PREDECISIONAL ENFORCEMENT CONFERENCE ARE SUBJECT TO FURTHER REVIEW AND MAY BE REVISED PRIOR TO ANY RESULTING ENFORCEMENT ACTION

Licensee's Presentation

Attachment 4



Nuclear Science Center

Texas A&M Nuclear Science Center Br-82 Shipping Incident

W. D. Reece

Director
Nuclear Science Center
Texas Engineering Experiment Station
Texas A&M University System
March 29, 2001

Event Chronology



Nuclear Science Center

12/4/00

- NSC loaded three swageloks of Br-82 into a Tru-Tec shipping container (Total of 918 mCi).
- Acme trucking transported the container from NSC to Federal Express terminal at Bush Intercontinental Airport, Houston.
- Federal Express shrink-wrapped the package.

12/5/00

- Package arrived in Memphis, TN. Stayed at Memphis for 2 days.

12/7/00

- Package, no longer shrink-wrapped, left Memphis.



Event Chronology (contd..)

12/8/00

- Package arrived in San Juan, Puerto Rico.
- Transported to St. Croix, Virgin Islands by Four Star Air Cargo.

12/8/00

- Tru-Tec received the container (4:30 p.m.)
- Discovered that the swageloks containing Br-82 were resting on top of the container between the lid and collar. Container's "T-bar" was missing.
- Tru-Tec contacted the shipper and all carriers.
- T-bar was later found at Memphis Federal Express facility.

Event Chronology (contd..)



Nuclear Science Center

12/12/00

- NSC management, after reconstructing the event, acknowledged that the package left the facility without the “T-bar” secured and with no tamper indicating device installed.



Root Cause Analysis

After transferring the materials into the Tru-Tec shield, one of the NSC staff found that the shield had arrived at NSC without a securing device for the “T-bar”.

The NSC worker took verbal assurance from the truck driver that the package was secure for shipment in the secured Acme Truck. The worker didn’t report the lack of “a securing device” to the certified shipping individual.

The certified shipping individual did not examine the package, relying on the verification from the NSC worker who loaded the shield.



Immediate Remedial Actions

- NSC immediately stopped all shipments after the incident until further review could be done. Then, NSC management initiated management review on all shipments until further notice. A new NSC policy which requires three independent reviews to be performed on all radioactive material shipments.
- NSC immediately had a general radioactive material shipping training session for all persons involved in shipping.



Future Remedial Actions

- NSC will incorporate the HazMat and general shipping training in the operator re-qualification program.

- The first training was already given as part of 'Radiation Safety and Controls' training on March 22, 2001.

The training will be followed by a written test a week after the lecture.

- NSC will retrain all HazMat workers every two years.



Nuclear Science Center

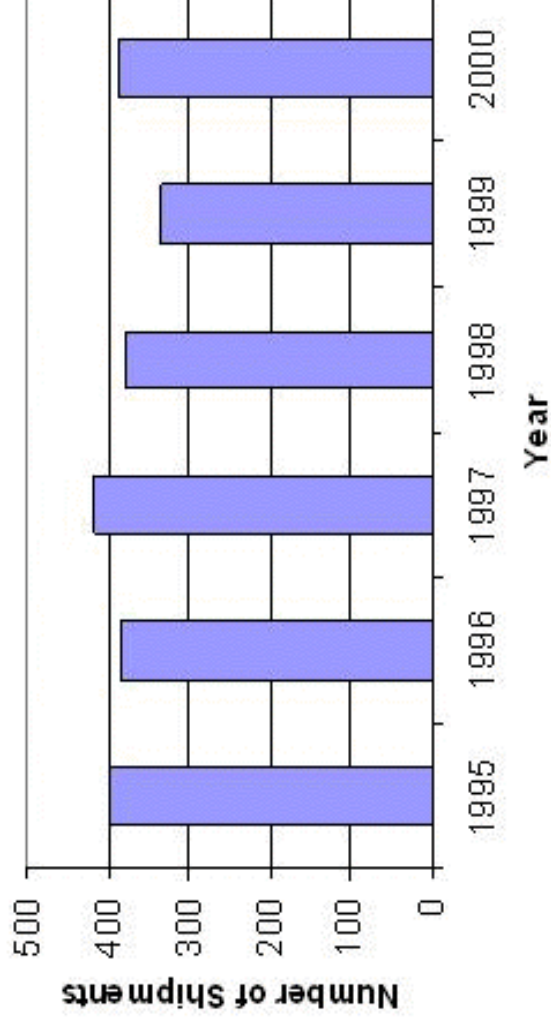
Background Information

This incident is not at all typical of NSC operations.
NSC staff are well trained in every aspect of the reactor operation, radiation safety, radioactive material handling, etc.

NSC Shipping History



Nuclear Science Center



Total of about 2300 shipments for the past 5 years



NSC Training Programs

The NSC workers are highly trained in radioactive materials handling and shipping.

1. General Employee Training (GET) is given to all NSC employees. The training includes general HazMat awareness.
2. Radiation Worker Training (RWT) is given to all reactor operators, health physicists, experimenters and others as necessary.
3. Reactor Operator Training (ROT) is given to all new operators.
4. Reactor Operator Re-qualification Training (RORT) is given to all licensed operators.
5. Shipping Certification Training (SCT) is given to all new shippers.
6. In addition, various function-specific trainings are provided by individual supervisors. This includes how to handle radioactive materials, how to transfer materials into shields, etc.



Nuclear Science Center

NSC Training Programs (Contd..)

All shipments are performed under the direct supervision of NSC certified shippers.

- Shipper certification includes training required by 49CFR172.704, a written examination, at least 6 supervised shipments and an oral board.
- NSC uses a check list to assure that shipment has been properly prepared to meet applicable regulations.



Nuclear Science Center

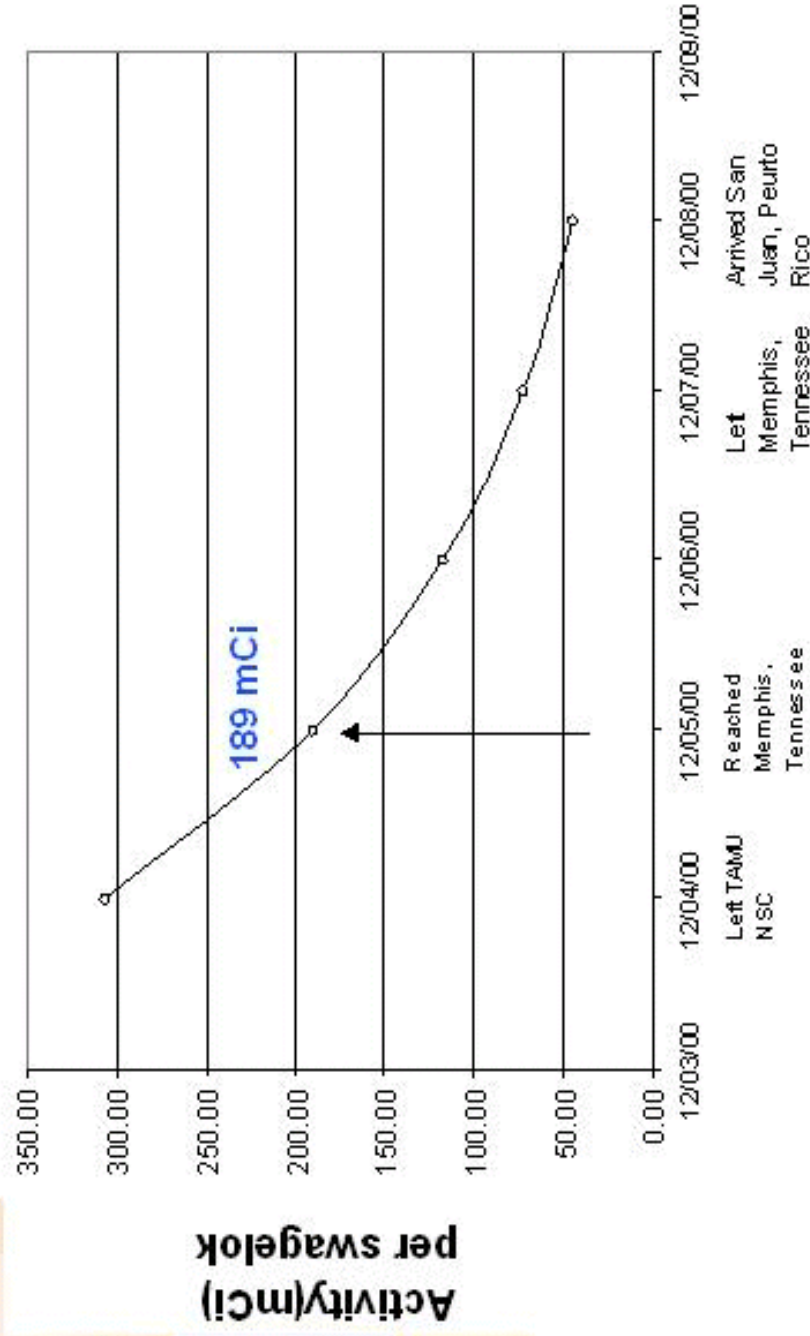
Dose Reconstruction for ^{82}Br Event

- Taking conservative assumptions, the postulated doses from credible scenarios are below regulatory limits.

^{82}Br Activity vs. Time



Nuclear Science Center



^{82}Br Dose Calculations



Nuclear Science Center

Dose rate

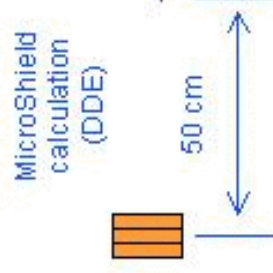
- DDE: 3 rem/hr (MicroShield v5.03)
- EDE: 2 rem/hr (MCNP4C)

Dose for 10 second exposure

- DDE: 8.3 mrem
- EDE: 5.5 mrem

Assumptions

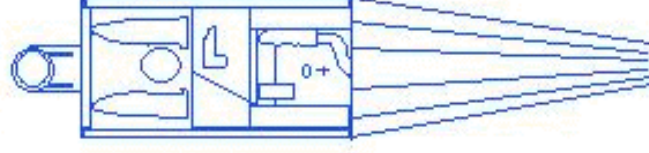
- December 5, 2000 (189 mCi per swagelok)
- Dose rates from 3 swageloks
- Distance is 50 cm
 - DDE: source to the dose point
 - EDE: source to body surface



MicroShield
calculation
(DDE)

50 cm

MCNP
calculation
(EDE)





Conclusions

- NSC accepts the violations that occurred during the bromine-82 shipment.
- No programmatic or systematic weaknesses were identified during inspections by NRC, DOT, or NSC.
- Except for the “T-bar” issue, the package was properly prepared according to all the NRC and DOT regulations, including proper shipping paper work and package warnings.
- NSC instigated an immediate response after the incident and has been fully cooperative.



Conclusions (Contd..)

NSC took immediate corrective actions after the incident, including management review of every shipment.

NSC has developed and implemented a very detailed training program to cover shipping issues in Reactor Operator Re-qualification Program (RORP).

- Finally, Our goal is and will be zero misshipments. We believe that this incident is not typical of normal NSC operations but was a momentary lapse of a well-trained employee. We will take all necessary actions to prevent this type of incident in the future.

NSC comments on Severity Levels

-Transportation



Nuclear Science Center

Level IV:

“A noncompliance with shipping papers, markings, labeling, placarding, packaging or loading not amounting to a severity level I, II, or III violation.”

The NSC accepts this violation.

NSC comments on Severity Levels

-Transportation



Nuclear Science Center

Level III:

“A substantial potential for either personnel exposure or contamination above regulatory limits...”

As shipped from the NSC, the potential for personnel exposure above regulatory limits should not have been substantial.

(Any breach of shielding should have triggered notification of shipper and stopped shipment.)