NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-254/92021(DRSS); 50-265/92021(DRSS)

Docket Nos. 50-254; 50-265 License Nos. DPR-29; DPR-30

Enforcement Action No. 92-148

Licensee: Commonwealth Edison Company

Facility Name: Quad Cities Nuclear Power Station - Units 1 and 2

Enforcement Conference At: Region III Office, Glen Ellyn, Illinois

Enforcement Conference Conducted: August 28, 1992

Inspector: R. A. Paul 9-1-92
Date

Approved By: 9-1-92
M. C. Schumacher, Chief Date
Radiological Controls Section 1

Enforcement Conference Summary

Enforcement Conference on August 28, 1992 (Report Nos. 50-254/92021(DRSS); 50-265/92021(DRSS))
Areas Discussed: The circumstances surrounding the July 16, 1992, shipment of radioactive material which exceeded Department of Transportation Requirements. Included in the discussion were the accuracy of Inspection Report Nos. 50-254/92020 and 50-265/92020, in which this event is described in detail, root causes, and the corrective actions.

DETAILS

1. Persons Present at the Enforcement Conference

Commonwealth Edison Company

D. Galle, Vice President - BWR Operations
K. Graesser, General Manager, BWRs
T. Kovach, Nuclear Licensing Manager
R. Bax, Station Manager
F. Rescek, Nuclear Stations Radiation Protection Director
A. Lewis, Health Physics Supervisor, Quad Cities
D. Saccamondo, Compliance Engineer
T. Poindexter, Attorney for CECO
M. Lesniak, Health Physics Supervisor, Corporate
D. Ambler, Health Physics Supervisor, Dresden
E. Roche, Health Physics Supervisor, Braidwood
M. Friedmann, Lead Health Physicist, LaSalle
P. Barnes, Compliance Supervisor
S. Horvath, Principal Health Physicist
A. Haber-Kovach, Health Physics Training Supervisor
R. Tadesse, Health Physicist
R. Mika, Health Physics Supervisor, Zion
A. Misak, Regulatory Assurance Supervisor
D. Kimler, Station Shift Engineer, Quad Cities
D. Edwards, Radiation Protection Technician, Quad Cities
D. Kanakares, Regulatory Assurance, Quad Cities

Others

J. Bell, Senior Engineer, Nuclear Licensing, AEPSC
M. Reandeau, Licensing Specialist, Illinois Power
D. Lyons, Technical Analyst, Illinois Department of Nuclear Safety

Nuclear Regulatory Commission

A. B. Davis, Regional Administrator
C. Norelius, Director, Division of Radiation Safety and Safeguards
B. Berson, Regional Counsel
M. Schumacher, Chief, Radiological Controls, Section 1
R. DeFayette, Director, Enforcement
P. Pelke, Enforcement Specialist
R. Paul, Senior Radiation Specialist
C. VanDenburgh, Deputy Director, Office of Enforcement
R. Knop, Project Section Chief
T. Taylor, Senior Resident Inspector (via telephone)
B. Clayton, Chief, Projects Branch 1
W. Radcliffe, Physical Science Aide
A. Markley, Senior Radiation Specialist
N. Shah, Radiation Specialist

M. Kunowski, Senior Radiation Specialist
R. Strasma, Senior Public Affairs Officer

2. Enforcement Conference

An Enforcement Conference was held in the NRC Region III office on August 28, 1992. The purpose of the conference was to discuss the circumstances surrounding the July 16, 1992, shipment of radioactively contaminated underwater control rod blade cutting equipment. The package containing the equipment was sent to the Millstone Nuclear Station and upon arrival was found to exceed Department of Transportation radiation limits of 200 mrem/hr at the surface of the package. An inspection was conducted on July 29 and 30, 1992, and the inspection findings were documented in Inspection Report Nos. 50-254/92920(DRSS) and 50-265/92020(DRSS), transmitted to the licensee on August 14, 1992.

The conference agenda included (1) a discussion of the apparent violations, their causes and safety significance, the licensee's corrective actions, and areas of concern, (2) a determination if there were any escalating or mitigating circumstances, and (3) obtaining further information which would help determine the appropriate enforcement action. The licensee did not identify any inaccuracies or discrepancies in Inspection Report Nos. 50-254/92020(DRSS) and 50-265/92020(DRSS). In addition, the licensee discussed a one inch by two inch area on the side of the package which slightly exceeded the regulatory limits and was discovered by them late during their investigation. This information was not available during the NRC inspection and was not documented in Inspection Report Nos. 50-254/92020(DRSS) and 50-265/92020. They also emphasized that the truck radiation limits were not exceeded.

The licensee described the events which led to the apparent violations, including the root and contributing causes, safety significance and their corrective actions. The licensee indicated that the event was an isolated problem with no likely potential for an exposure to a member of the public. The corrective actions are described in the attached copy of the licensee's handouts. These actions will be reviewed during future inspections. Also attached are the Region III slides presented at the conference meeting.

At the conclusion of the conference, the licensee was informed they would be notified in the near future of the final enforcement action.

Attachments: As stated

QUAD CITIES ENFORCEMENT CONFERENCE

RADIOACTIVE MATERIAL SHIPMENT EVENT

AUGUST 28, 1992

AGENDA

INTRODUCTION	K. GRAESSER/R. BAX
EVENT CHRONOLOGY	A. LEWIS
EVENT SIGNIFICANCE	A. LEWIS
CORRECTIVE ACTIONS	A. LEWIS
COMMISSION PRACTICE	T. KOVACH
CLOSING	D. GALLE

ZNLD/2098

INTRODUCTION

- Quad Cities Radiation Protection Department
  - 41 Radiation Protection Technicians (RPTs)
  - All RPTs receive 13 week initial training
    - Survey techniques
    - Administrative Controls
    - Applicable Regulations
    - Industry Experiences
  - All RPTs receive two-week annual retraining
  - Training program accredited by the Institute of Nuclear Power Operations

EVENT CHRONOLOGY

SCOPE - Vendor performed Control Rod Blade cutting operations in the Unit 1 fuel pool with an underwater cutter. Operation consists of using a 6X5X5 foot cutter and a 3X2X2 foot dump bucket which collects the debris from the press cutting operation.

Special Radiation Protection Controls were applied to this project:

- Designated Radiation Protection Technician (RPT) for job through loading of cutter into the shipping container
- Daily debriefing by RPT with RP management
- Daily prejob briefings were held
- Lessons learned on previous cutting operations and industry experience was applied
- Cutter was thoroughly surveyed

6/25 to 7/1 Cutter was removed from the Unit 1 fuel pool and placed in a contaminated area tent.

Following decontamination, RPT1 surveyed the cutter using a teletector with emphasis on the detection of loose or hidden hot sources. After the final survey, the cutter was wrapped.

EVENT CHRONOLOGY (Continued)

7/6 to 7/10 — The cutter was placed into a 12x8x8 foot metal shipping container.

Dump bucket 1 was removed from the fuel pool. RPT1 surveyed bucket with an ionization chamber and identified 1R/hr hot spot. The dump bucket was deconned and wrapped. The 1 R/hr hot spot was fixed and could not be removed.

The dump bucket was placed in the corner of the container with the hot spot towards the bottom. Typically the dump bucket is placed inside the cutter for shipment.

RPT1 surveyed the inside of the container with an ionization chamber and recorded a general dose rate of 200 mR/hr near the dump bucket. Dose rates on the sides (not bottom) of the container were less than 62 mR/hr.

7/11 to 7/12 — Dump buckets 2 and 3 were removed from the fuel pool, deconned, wrapped, and placed inside of the shipping container.

Dump bucket 1 is moved closer to the center of the container (near the cutter).

7/13 — RPT2 performed a general area survey of the inside of the container. No unusual readings were identified. The shipping container was closed and a survey was performed on the outside of the container. No unexpected dose rates were noted.

7/16 Using an ionization chamber, RPT2 performs preliminary survey of the shipping container, including a part of the bottom, prior to moving the container from the refuel floor to the 595 foot elevation. No significant dose rates were noted.

On the 595 foot elevation, RPT2 again surveys the container with an ionization chamber. The highest contact dose rate detected was 90 mR/hr.

The container was lifted and set onto the truck. RPT2 surveyed the bottom of the container using a teletector and detected 125 mR/hr.

The departure survey of the truck was performed. Dose rates were less than 125 mR/hr. Shipment departs for Millstone.

7/20 Millstone performs arrival survey on the shipment using a teletector:

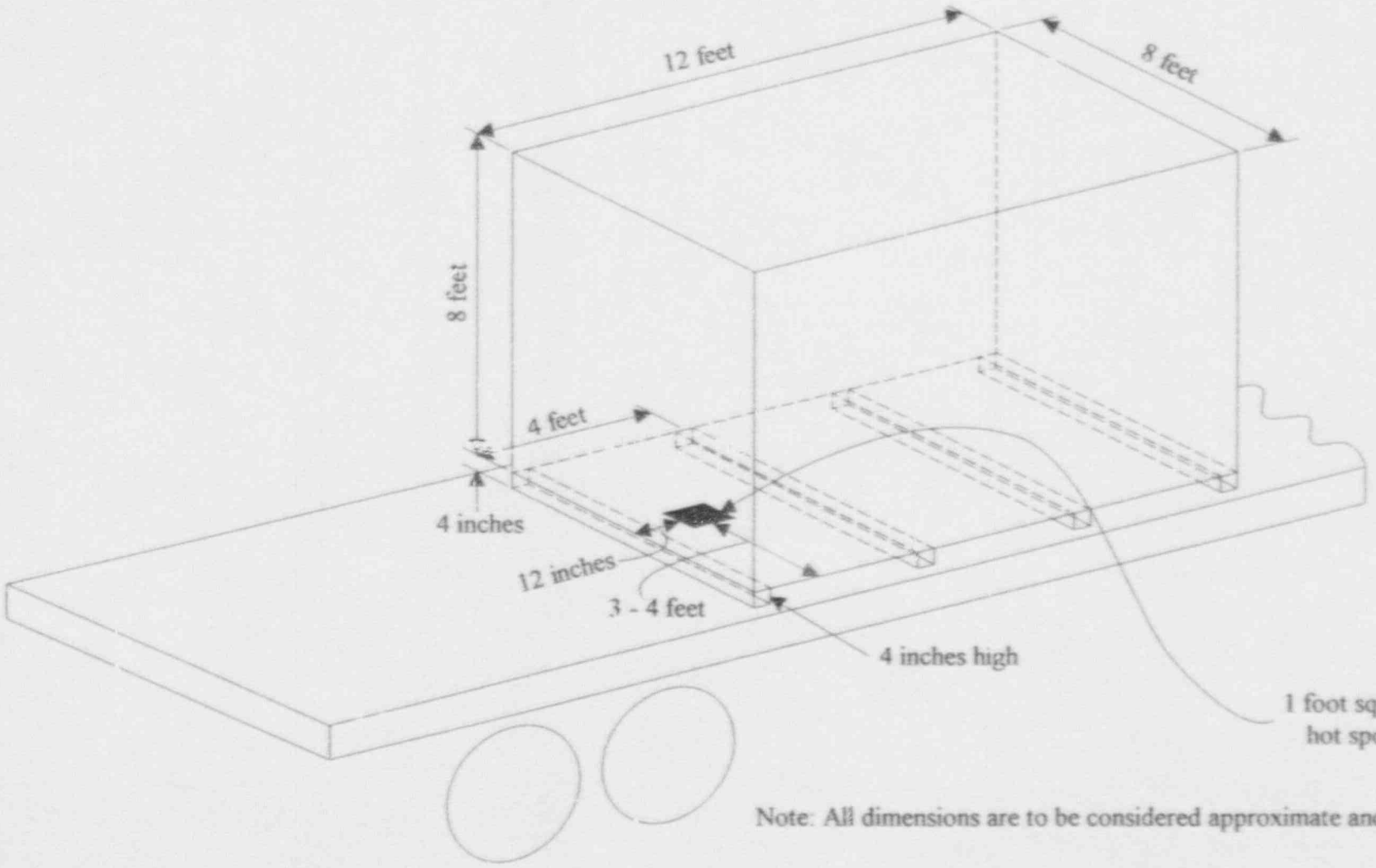
- A one square foot area hot spot on the bottom of the shipping container (located approximately 3 feet from the outer edge of the container) with dose rates of 200 to 1500 mR/hr.
- A 1 inch by 2 inch area on the side of the container (located approximately 1 foot from the back and 4 inches up from the bottom) with a dose rate of 200 to 220 mR/hr.
- Vehicle dose rates were below DOT limits.

Millstone notifies CECo. CECo alerts the NRC of the potential DOT violation. Millstone unloads the container from the truck.

EVENT CHRONOLOGY (Continued)

7/20 The teletector used for the departure survey was checked and found to be in proper working order.

7/22 The shipping container is opened and contents are surveyed by CECo and Millstone. The contents of the container were in place and had not moved during shipment. Hot spot of 2.2 R/hr is identified on dump bucket 1 with a small diameter ionization chamber.



Note: All dimensions are to be considered approximate and not exact.

SAFETY SIGNIFICANCE

- Shipment was transported via an exclusive use vehicle. This precluded unauthorized individuals from handling the package during transport.

- The area of concern (i.e. 1500 mR/hr) was not accessible:

  - The hot spot was located near the bottom center of the package, approximately three feet from the outer edge of the shipping container.

  - The clearance between the bottom of the container and the bed of the truck was approximately 4 inches.

  - The weight of the container (approximately 2600 pounds) would require a mechanical lifting device to move the container.

- Vehicle dose rates were below DOT limits.

- Individuals involved in the transport of the shipment did not incur unnecessary exposure.

CONCLUSION:

Because of the controls placed on the shipment, the inaccessibility of the hot spot and the low vehicle dose rates, there was no undue risk to the general public and the safety significance was minimal.

EVENT CAUSES

A Human Performance Evaluation System (HPES) investigation was conducted for this event to identify any inappropriate actions and determine their root and contributing causes.

ROOT CAUSE

- Personnel Error - RPT2 failed to adequately survey the shipping container on the truck.
  - The reason for the error could not be specifically determined.

CONTRIBUTOR

- Personnel Error - RPT1 failed to shield the hot spot on dump bucket #1 or to properly position dump bucket #1 in the shipping container.

- Although RPT1 documented the 1R/hr hot spot, there was no verbal communication indicating the hot spot during the turnover to RPT2.

CORRECTIVE ACTIONS TO ADDRESS THE ROOT CAUSE

- Personnel involved were counselled with respect to their performance in not meeting management's expectations. Emphasis was placed on the conduct of thorough surveys, documentation of survey results, the need to take additional action when observing a radiological condition which could lead to a DOT violation, and communications.

- In addition to ongoing periodic management oversight, RP Management will monitor RPT1 and RPT2's performance during their next assignment to a shipping evolution.

- Appropriate disciplinary action was taken.

CORRECTIVE ACTIONS TO ADDRESS THE CONTRIBUTOR

- Procedure QRP 1520-2, "Surveying Radioactive Material Shipments," has been revised:
  - Items being prepared for shipment with contact dose rates greater than 100 mR/hr will be documented on a survey indicating the items location in the package. These surveys will be forwarded to Radiation Protection Management who will review the documentation for conditions that could contribute to potentially exceeding DOT requirements.
  - Precautions will be added to emphasize proper orientation or shielding of hot spots.
  - For packages being loaded onto a shipping truck, the bottom surface of the package will be surveyed prior to placement on the truck.
  - Training on these changes has been provided to the Radiation Protection Department personnel.

OTHER ACTIONS TAKEN

- The Quad Cities shipping processes and practices were reviewed during the event investigation. No other deficiencies were identified.

- The Training Department will revise the lesson plans on Radioactive Material Shipments to incorporate specifics of this event and its corrective actions. This training will be incorporated into the 1993 Continuing Training Program for Radiation Protection Department personnel.

- A Lessons Learned Initial Notification on this event was transmitted to the other CECo stations on July 31, 1992.

- The event, its impact and directions to RPTs were tailgated with RP personnel on August 5, 1992.

COMMISSION PRACTICE

COMPARABLE TRANSPORTATION EVENTS CRITICAL FACTORS

- Inaccessibility of the radiation source has resulted in a reduction in Severity Level (Ref. EA 87-106 and EA 90-193).
  - The hot spot on the container was not accessible to the public:
    - Location near the bottom center of container
    - Only 4 inches of clearance between bottom of container and bed of truck
    - Container could not be moved by hand
- Good prior performance has resulted in complete mitigation of transportation civil penalties (Ref. EA 86-75, EA 86-95 and EA 89-145).
  - A review of the Quad Cities Radioactive Materials Shipping Program shows that no DOT violations had occurred since 1982. Numerous shipments have been made without error.
  - The success of the Quad Cities program was cited in the recent SALP 10 Report. The RP staff experience and technician certification program was viewed as a strength.
- Transportation events involving Type A quantity or less are covered by the Transportation portion of Table 1A in the Enforcement Policy.

U.S. NUCLEAR REGULATORY COMMISSION
REGION III

ENFORCEMENT CONFERENCE

WITH

COMMONWEALTH EDISON COMPANY

QUAD CITIES NUCLEAR STATION

AUGUST 28, 1992

9:00 A.M. CDT

EA 92-148

REPORT NUMBER: 50-254/92020
50-265/92020

REGION III OFFICE

GLEN ELLYN, ILLINOIS

QUAD CITIES AUGUST 28, 1992
ENFORCEMENT CONFERENCE AGENDA

INTRODUCTION:
A. Bert Davis, Regional Administrator

DISCUSSION OF ENFORCEMENT POLICY:
R. W. DeFayette, Director, Enforcement and Investigation Coordination Staff

PRESENTATION OF THE EVENT AND APPARENT VIOLATIONS:
R. A. Paul, Senior Radiation Specialist, DRSS

LICENSEE PRESENTATION

BREAK

NRC FOLLOWUP QUESTIONS

CLOSING REMARKS
A. Bert Davis

CHRONOLOGY OF EVENTS

July 16, 1992 Quad Cities personnel shipped a box of radioactively contaminated equipment to the Millstone Nuclear Power Station in an 8 by 8 by 12 foot box strapped to a flatbed truck.

July 20, 1992 Upon receipt of the box, a survey, performed by Millstone personnel, identified a 1 by 1 foot area on the bottom of the box which had external readings of 600 to 1500 millirem per hour. This exceeded the Department of Transportation limits of 200 millirem per hour.

Chronology of Events, Cont.

July 22, 1992	Quad Cities personnel arrive at Millstone and confirm Millstone's readings, and that the contaminated equipment had not shifted during transit.
July 24, 1992	Quad Cities begins the onsite investigation into the circumstances surrounding the box exceeding regulatory limits.

APPARENT VIOLATIONS

10 CFR 71.5(a) requires that licensees who transport licensed material outside the confines of their plants or deliver licensed material to a carrier for transport comply with the applicable requirements appropriate to the mode of transport of the Department of Transportation (DOT) in 49 CFR Parts 170 - 189.

A. 49 CFR 173.475 requires, in part, that, before each shipment of any radioactive materials package, the shipper ensure by examination or appropriate tests that the external radiation levels are within allowable limits.

Contrary to the above, on July 16, 1992, a package containing radioactive materials was shipped without the shipper ensuring by appropriate surveys that external radiation levels were within applicable limits. Specifically, the departure survey failed to detect radiation levels of 600 to 1500 millirem per hour, which exceeded the 200 millirem per hour allowable limits.

(The apparent violations discussed in this enforcement conference are subject to further review and may be subject to change prior to any resulting enforcement action.)

B. **49 CFR 173.441 requires, in part, that radioactive materials offered for transport in an open transport exclusive use vehicle shall be designed and prepared for shipment so that, under condition normally incident to transportation, the radiation level does not exceed 200 millirem per hour at any point on the external surface of the package.**

Contrary to the above, on July 16, 1992, a package containing radioactive materials was transported from the Quad Cities Nuclear Power Station to the Millstone Nuclear Power Station in an open transport exclusive use vehicle with radiation levels from 600 to 1500 millirem per hour on the underside external surface of the package.

(The apparent violations discussed in this enforcement conference are subject to further review and may be subject to change prior to any resulting enforcement action.)