

September 13, 2002

The Honorable Edward J. Markey
United States House of Representatives
Washington, D.C. 20515

Dear Congressman Markey:

I am responding on behalf of the U.S. Nuclear Regulatory Commission to your letter of July 19, 2002, in which you expressed concern about conflicting accounts of a FedEx shipment of iridium-192 from Sweden, via Paris, France, to the United States. You raised a number of specific questions regarding that shipment.

As I noted in my February 19, 2002 letter to you, the Nuclear Regulatory Commission does not have a direct regulatory role in regulating this matter because the shipment was made to an Agreement State. We were available as a resource to the State of Louisiana and the Department of Transportation, and have closely followed the investigation of our Swedish and French regulatory colleagues.

Our responses to your specific questions about these matters are enclosed. If you have further questions, please contact me.

Sincerely,

/RA/

Richard A. Meserve

Enclosures:

1. Responses to questions
2. Preliminary Notifications, PNO-IV-02-001, 001A, 001B

cc: Richard Boyle
Department of Transportation

Michael E. Henry, State Liaison Officer
Department of Environmental Quality

Responses to Questions from Congressman Markey

Question 1: The U.S. Customs response indicates that NRC advised Customs that “it may not be possible to determine the exact point at which the container first became compromised and the rate of exposure/emissions that occurred as the container was transported from Sweden to New Orleans via France.”

Question 1.a: Did NRC make this statement to U.S. Customs? If so, please provide a copy of the document in which this statement was made.

Response: No such statement was made in writing, although U.S. Nuclear Regulatory Commission (NRC) staff may well have made such a comment to U.S. Customs in telephone discussions. The statement is true, as it may not be possible to determine the exact point at which the container first became compromised. The response to Question 1.b will further explain this point. Transportation regulations (both international and U.S.) require shippers to perform radiation surveys of radioactive material packages before shipment to ensure they are properly shielded. The ongoing French biodosimetry investigation of workers at the Paris airport provides some indication that the package was compromised by the time it arrived in Paris (or during its handling at the Paris airport).

Question 1.b: Is the French report that some of the stoppers of the tubes containing the radioactive sources had been unscrewed, and that the sources fell out of the tubes, which was why the package was leaking, true? If so, why wouldn't it be possible to determine the exact point at which the container first became compromised? How could the stoppers have become unscrewed after the package was sealed, unless someone either improperly screwed on the stoppers in Sweden, or, alternatively opened the package, unscrewed the stoppers and then resealed the package? If the French report is true, doesn't this mean that the package was compromised throughout the entire journey?

Response: The French report's description regarding the stoppers and sources is true. When the package was opened, it was discovered that the caps of two of the three capsules inside the inner container (containment vessel) of the package were off, and the iridium-192 wafers were spread throughout the cavity of the package. Although the wafers remained within the containment vessel, they were no longer in a fully shielded configuration, which caused the resulting high radiation levels.

A comparison of the capsule, capsule holder, and inner pot dimensions show that the caps of the capsules had adequate clearance to come off the capsules while inside the package. There may be no way of determining exactly when or how the caps came off of the capsules. However, the tamper-indicating device on the package was not compromised, indicating that the package was not opened during transport.

ENCLOSURE 1

Question 1.c: Why would it not be possible to calculate the rate of exposure/emissions that occurred? Wouldn't this rate be constant throughout the package's journey, and equal to the rate that was measured at the point of the package's arrival? Why or why not?

Response: It is possible to roughly estimate the rate of exposure (dose rates) that occurred. Although the rate probably was not constant throughout the package's journey, a conservative estimate would assume it was equal to the rate that was measured at the point of the package's arrival. The U.S. Department of Transportation (DOT) investigation is ongoing and no report has been issued, but preliminary indications are that the stoppers became loose at some point during transit. Vibrations during transport may have caused the stoppers to work loose and allowed the iridium wafers to gradually vibrate out of their shielded tubes. The French biodosimetry investigation would indicate that this process had resulted in radiation leakage at the time the package was in Paris.

Question 2: The U.S. Customs response indicates that it has not yet received the final findings from the NRC or the Department of Transportation regarding this situation. When will the NRC findings be completed and sent to U.S. Customs? Please provide a copy of these findings if they have been completed. If they have not yet been completed, please provide me with a copy when they are finalized.

Response: NRC contracted with Oak Ridge National Laboratory (ORNL) to perform an examination of the transportation packaging after the radioactive material was removed. The examination is to provide sufficient information for a determination regarding the physical condition of the packaging itself, and whether the packaging was fabricated according to the approved design. A final report is expected shortly and it will be publicly available.

Question 3: The U.S. Customs response states that NRC "informed the U.S. Customs Radiation Safety Office (RSO) that no Customs personnel were exposed."

Question 3.a: Is this true? What is the basis for such a finding? Please provide a copy of the document in which this finding is conveyed and all supporting analysis used to reach this conclusion.

Response: No such statement was made in writing to U.S. Customs. NRC and U.S. Customs staff did have several conference calls about the incident and discussed potential exposure of Customs personnel. Based on those discussions, someone may have concluded that Customs personnel were not exposed or not significantly exposed. That conclusion would have been based on electronic dosimetry readings and efforts to estimate possible doses to Customs personnel, taking into account their physical relationship to the package. Louisiana (as an NRC Agreement State) has regulatory authority for the investigation in New Orleans and may have more information.

Question 3.b: Do you still believe that no Customs officials were exposed, in light of the French report that FedEx officials were exposed in France? Why wouldn't Customs officials have been exposed?

Response: Any conclusion that Customs officials were or were not exposed would be based on electronic dosimetry readings and efforts to estimate possible doses to Customs personnel. If the Customs personnel did not come close to the package and did not enter the pathway in which the radiation was streaming, no exposure would have occurred.

Question 4: Were NRC officials present when the package was opened in Louisiana? If so, please provide a copy of those officials' report/description of the incident.

Response: NRC officials were present, at the invitation of DOT and the State of Louisiana, to see the package opened. Because NRC is not the regulatory authority for the shipment or the State receiving the shipment, no report was issued. Attached is a Preliminary Notification of Event or Unusual Occurrence (PNO), dated February 8, 2002, which captured the NRC officials' observations of the incident. We also are including the two earlier PNOs on this incident, dated January 3 and 7, 2002, for your information.

Question 5: Please provide me a complete list of measures the NRC has taken since September 11 to ensure that radioactive materials are better controlled both within this country and in shipments to this country. For each such measure, please indicate whether it is intended to be a permanent or temporary change to NRC procedures.

Response: With respect to transportation, NRC issued two security advisories, in November and December 2001, relating to the transportation of spent fuel and large quantities of radioactive material. The NRC also issued an Order in December 2001 to a licensee to ensure that a particular research reactor spent fuel shipment would be carried out consistent with our advisories. Because of the continuing current threat environment, NRC is in the process of issuing Orders that would impose legally binding requirements [Interim Compensatory Measures (ICMs)] on licensees, for the transportation of spent fuel and large quantities of radioactive material. These Orders would also apply to imports, exports, and transshipments (i.e., shipments that pass through the U.S.). The ICMs include requirements associated with items contained in the previously issued security advisories and additional requirements that NRC subsequently identified.

NRC is currently working to finalize and issue these Orders and ICMs. NRC is coordinating these actions with other key Federal agencies, such as DOT and the U.S. Department of Energy (DOE). These Orders and ICMs will remain in place until NRC can complete vulnerability studies and evaluate and develop necessary changes to its transportation security regulations. NRC is also working with DOT on the need for conforming changes to DOT's regulations.

NRC has also established a joint working group with the Department of Energy to evaluate for “cradle-to-grave” control of radioactive sources which might be used in a radiological dispersal device. As part of the evaluation, the NRC is working with the Agreement States to establish a consolidated listing of higher-risk materials licensees that may be subject to additional requirements for enhanced security measures. The NRC is also reexamining its import and export licensing for these isotopes and is working with the International Atomic Energy Agency on establishing a code of conduct for licensing such materials. The NRC is also working with the Office of Homeland security and other agencies to ensure that the Federal Government is prepared to respond to an event involving a radiological dispersal device.

January 03, 2002

PRELIMINARY NOTIFICATION OF EVENT OR UNUSUAL OCCURRENCE -- PNO-IV-02-001

This preliminary notification constitutes EARLY notice of events of POSSIBLE safety or public interest significance. The information is as initially received without verification or evaluation, and is basically all that is known by the Region IV staff on this date.

Facility

Source Production and Equipment Company
St. Rose, Louisiana
(State of Louisiana Licensee)

Licensee Emergency Classification

Notification of Unusual Event
 Alert
 Site Area Emergency
 General Emergency
 Not Applicable

SUBJECT: HIGH RADIATION LEVELS DETECTED ON IMPORTED PACKAGE OF RADIOACTIVE MATERIAL

DESCRIPTION: On January 2, 2002, Source Production and Equipment Company (SPEC), a State of Louisiana licensee, notified the National Response Center of the discovery of high radiation levels measured on a package containing iridium-192 received by the licensee at approximately 3:00 p.m. (CST) on January 2.

The licensee reported that a SPEC employee arrived at the Federal Express (FedEx) facility in New Orleans, Louisiana on the afternoon of January 2 to retrieve a shipment of iridium-192 that the licensee had purchased from a facility in Europe. The package arrived at the FedEx facility on December 31, 2001. Although the total quantity of material is unknown at this time, a SPEC representative stated that a typical shipment received by the licensee contains as much 370 terabequerels (10,000 curies) of unsealed, bulk, iridium-192 packaged in a Department of Transportation Type-B container. The sources were to be used by the licensee to manufacture industrial radiography sources.

Upon arrival at the FedEx facility, a SPEC employee performed a radiation survey of the package and observed that his radiation detection survey instrument was "stuck." Believing that his survey instrument was malfunctioning, the individual loaded the Type-B container in his vehicle and transported the package back to SPEC's facility located approximately 1-2 miles from FedEx. Upon arrival at the licensee's facility, the individual observed that his pocket dosimeter read approximately 160 milliroentgen. Noting that this was an abnormally high reading, the SPEC employee performed another radiation survey of the package containing iridium-192 and observed a dose rate of 1 roentgen per hour at a distance of 20 feet. The package was immediately secured in the licensee's hot cell facility, and SPEC's radiation safety officer was then promptly notified of the event. The licensee subsequently performed a wipe test of the package for removable contamination and identified no detectable activity.

The licensee is investigating the incident, and has obtained a health physics consultant to assist with their review. The State of Louisiana, Department of Environmental Quality has been in contact with SPEC and will begin a reactive inspection on January 3, 2002. The State has not requested assistance from the NRC at this time.

NRC Operations Center received notification of this occurrence from the National Response Center at 4:48 p.m. (EST) on January 2, 2002. Region IV has informed OEDO, NMSS, and OSTP.

This information has been discussed with the State and is current as of 9:30 p.m. (CST) on January 2, 2002.

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January 07, 2002

PRELIMINARY NOTIFICATION OF EVENT OR UNUSUAL OCCURRENCE -- PNO-IV-02-001A

This preliminary notification constitutes EARLY notice of events of POSSIBLE safety or public interest significance. The information is as initially received without verification or evaluation, and is basically all that is known by the Region IV staff on this date.

Facility

Source Production and Equipment Company
St. Rose, Louisiana
(State of Louisiana Licensee)

Licensee Emergency Classification

Notification of Unusual Event
 Alert
 Site Area Emergency
 General Emergency
 Not Applicable

SUBJECT: HIGH RADIATION LEVELS DETECTED ON IMPORTED PACKAGE OF RADIOACTIVE MATERIAL - UPDATE

DESCRIPTION: This provides updated information regarding an event which occurred on January 2, 2002, when Source Production and Equipment Company (SPEC), a State of Louisiana licensee, notified the National Response Center of the discovery of high radiation levels measured on a package containing iridium-192 received by the licensee at approximately 3:00 p.m. (CST) on January 2.

NRC Region IV dispatched an inspector to New Orleans, Louisiana, on January 3, 2002. The NRC inspector accompanied a State of Louisiana inspector to the licensee's facility in St. Rose, Louisiana, and Federal Express's (Fed Ex) consultant to the Fed Ex facility at New Orleans International Airport.

The inspectors verified that the package was shielded and secured at the licensee's facility. The licensee performed additional surveys of the package prior to shielding it with lead and concrete blocks. The survey revealed the following radiation exposure profile: 1 roentgen per hour at 15 feet from the sides of the package, 300-400 milliroentgen per hour at 75 feet from the top of the package, and minimal readings at the bottom of the package. Licensee and Fed Ex personnel stated that the package's tamper seal appeared to be intact with no visible damage to the package.

The shipment contained approximately 347.8 terabecquerels (9400 curies) of iridium-192. The package is a Type -B container (Certificate USA/0382/B9U)-85, Revision 9), manufactured in Great Britain (Croft, Model 2835A). The shipment containing the radioisotopes left Studsvik, a reactor facility in Sweden, on December 27, 2001. It was flown by Fed Ex air cargo from Sweden to Paris, then on to Memphis Tennessee. Upon arrival in Memphis, the package was transferred to a cargo truck and driven to the New Orleans Fed Ex facility, where it arrived in the early morning hours of December 31, 2001.

The dosimetry badges worn by the two pilots who flew the package from Paris, France, to Memphis, Tennessee, (approximately 11 hours) were processed and indicated that the pilots received 0.75 millisievert (mSv) (75 mrem), and 0.05 mSv (5 mrem), respectively, for the reporting periods. The consultant for Fed Ex indicated that these readings were within the range routinely observed for these pilots. Based upon information obtained thus far, including the radiation exposure profile, interviews with workers, and time and motion studies, the consultant to Fed Ex believes that the maximally exposed individuals were Fed Ex package handlers in New Orleans and probably received a dose of no more than 2 rem (20 mSv). Fed Ex's consultant continues to assess the event and plans to perform additional dose assessments for individuals throughout Fed Ex's system.

A press release about the shipment was made on January 4, 2002, by Studsvik.

The State of Louisiana continues to investigate this event and NRC Region IV continues to coordinate with the U. S. Department of Transportation, the U. S. Customs Service, and the State of Louisiana.

This information has been discussed with the State and is current as of 2:00 p.m. (CST) on January 7, 2002. Region IV has informed OEDO, NMSS, and OSTP.

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February 8, 2002

PRELIMINARY NOTIFICATION OF EVENT OR UNUSUAL OCCURRENCE -- PNO-IV-02-001B

This preliminary notification constitutes EARLY notice of events of POSSIBLE safety or public interest significance. The information is as initially received without verification or evaluation, and is basically all that is known by the Region IV staff on this date.

Facility

Source Production and Equipment Company
St. Rose, Louisiana
(State of Louisiana Licensee)

Licensee Emergency Classification

Notification of Unusual Event
 Alert
 Site Area Emergency
 General Emergency
 Not Applicable

SUBJECT: HIGH RADIATION LEVELS DETECTED ON IMPORTED PACKAGE OF RADIOACTIVE MATERIAL - UPDATE

DESCRIPTION: This provides updated information regarding an event which occurred on January 2, 2002, when Source Production and Equipment Company (SPEC), a State of Louisiana licensee, notified the National Response Center of the discovery of high radiation levels measured on a package containing iridium-192 (Ir-192) received by the licensee on January 2. The shipment contained approximately 347.8 terabecquerels (9400 curies) of Ir-192. The package is a Type -B container (Certificate USA/0382/B9U)-85, Revision 9), manufactured in Great Britain (Croft, Model 2835A).

On February 7, 2002, the licensee opened the package to determine the cause of the incident. It was discovered upon opening that screw caps were off of two of the three capsules inside the inner container of the package, and that the Ir-192 wafers were out of the capsules. In addition, it was noticed that some of the wafers had oxidized and were stuck to the inside of the inner container and to each other.

The licensee plans to continue efforts to retrieve the usable Ir-192 wafers. The Department of Transportation has made plans to send the shipping package to Oak Ridge National Laboratories for evaluation at a date to be determined. Representatives from the State of Louisiana monitored the package opening activities. An inspector from NRC Region IV was also on site to observe the activities. Other observers included representatives from the Department of Transportation, the package manufacturer, the Ir-192 supplier, and the Swedish Regulatory Authority.

This information has been discussed with the State and is current as of 9:00 a.m. (CST) on February 8, 2002. Region IV has informed OEDO, NMSS, and STP.

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