

## RI - DNMS Licensee Event Report Disposition

Licensee: Schlumberger  
 Event Description: Lost Shipments  
 License No: 29-07636-02 Docket No: 03011318 MLER-RI: 2005-058  
 Event Date: \_\_\_\_\_ Report Date: \_\_\_\_\_ HQ Ops Event #: 41929

1. REPORTING REQUIREMENT

|                                     |                                      |                          |                              |
|-------------------------------------|--------------------------------------|--------------------------|------------------------------|
| <input type="checkbox"/>            | 10 CFR 20.1906 Package Contamination | <input type="checkbox"/> | 10 CFR 30.50 Report          |
| <input type="checkbox"/>            | 10 CFR 20.2201 Theft or Loss         | <input type="checkbox"/> | 10 CFR 35.3045 Medical Event |
| <input checked="" type="checkbox"/> | 10 CFR 20.2203 30 Day Report         | <input type="checkbox"/> | License Condition            |
| <input checked="" type="checkbox"/> | Other <u>Not Required</u>            |                          |                              |

2. REGION I RESPONSE

|                                     |                                 |                          |                           |
|-------------------------------------|---------------------------------|--------------------------|---------------------------|
| <input checked="" type="checkbox"/> | Immediate Site Inspection       | Inspector/Date           | <u>Nicholas 8/19/05</u>   |
| <input type="checkbox"/>            | Special Inspection              | Inspector/Date           |                           |
| <input type="checkbox"/>            | Telephone Inquiry               | Inspector/Date           |                           |
| <input type="checkbox"/>            | Preliminary Notification/Report | <input type="checkbox"/> | Daily Report              |
| <input checked="" type="checkbox"/> | Information Entered in RI Log   | <input type="checkbox"/> | Review at Next Inspection |
|                                     | Report Referred To: _____       |                          |                           |

3. REPORT EVALUATION NA

|                          |                        |                          |  |
|--------------------------|------------------------|--------------------------|--|
| <input type="checkbox"/> | Description of Event   | <input type="checkbox"/> | Corrective Actions                             |
| <input type="checkbox"/> | Levels of RAM Involved | <input type="checkbox"/> | Calculations Adequate                          |
| <input type="checkbox"/> | Cause of Event         | <input type="checkbox"/> | Additional Information Requested from Licensee |

4. MANAGEMENT DIRECTIVE 8.3 EVALUATION

|                          |                                   |                          |  |
|--------------------------|-----------------------------------|--------------------------|--|
| <input type="checkbox"/> | Release w/Exposure > Limits       | <input type="checkbox"/> | Deliberate Misuse w/Exposure > Limits                          |
| <input type="checkbox"/> | Repeated Inadequate Control       | <input type="checkbox"/> | Pkging Failure > 10 rads/hr or Contamination > 1000x Limits    |
| <input type="checkbox"/> | Exposure 5x Limits                | <input type="checkbox"/> | Large # Indivs w/Exp > Limits or Medical Deterministic Effects |
| <input type="checkbox"/> | Potential Fatality                | <input type="checkbox"/> | Unique Circumstances or Safeguards Concerns                    |
|                          | If any of the above are involved: | <input type="checkbox"/> | Considered Need for AIT  |
| <input type="checkbox"/> | Considered Need for IIT           |                          |  |
|                          | Decision/Made By/Date: _____      |                          |  |

5. MANAGEMENT DIRECTIVE 8.10 EVALUATION (additional evaluation for medical events only)

|                          |  |
|--------------------------|--|
| <input type="checkbox"/> | Timeliness - Inspection Meets Requirements (5 days for overdose / 10 days for underdose) |
| <input type="checkbox"/> | Medical Consultant Used-Name of Consultant/Date of Report: _____                         |
| <input type="checkbox"/> | Medical Consultant Determined Event Directly Contributed to Fatality                     |
| <input type="checkbox"/> | Device Failure with Possible Adverse Generic Implications                                |
| <input type="checkbox"/> | HQ or Contractor Support Required to Evaluate Consequences                               |

6. SPECIAL INSTRUCTIONS OR COMMENTS

Licenses 20,2203 30 day report was received on 9/28/05

Non-Public Inspector Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
 Public-SISP REVIEW COMPLETE Branch Chief Initials: [Signature] Date: 10/10/05

## RI - DNMS Licensee Event Report Disposition

Licensee: Schlumberger  
 Event Description: Lost Material 058  
 License No: 29 08636-02 Docket No: 030 11318 MLER-RI: 2005-065  
 Event Date: \_\_\_\_\_ Report Date: \_\_\_\_\_ HQ Ops Event #: 41929

1. REPORTING REQUIREMENT

|  |   |
|--|---|
| <input type="checkbox"/> 10 CFR 20.1906 Package Contamination<br><input checked="" type="checkbox"/> 10 CFR 20.2201 Theft or Loss<br><input type="checkbox"/> 10 CFR 20.2203 30 Day Report<br><input type="checkbox"/> Other _____ | <input type="checkbox"/> 10 CFR 30.50 Report<br><input type="checkbox"/> 10 CFR 35.3045 Medical Event<br><input type="checkbox"/> License Condition |
|--|---|

2. REGION I RESPONSE

|  |   |
|--|---|
| <input checked="" type="checkbox"/> Immediate Site Inspection<br><input type="checkbox"/> Special Inspection<br><input type="checkbox"/> Telephone Inquiry<br><input checked="" type="checkbox"/> Preliminary Notification/Report<br><input checked="" type="checkbox"/> Information Entered in RI Log<br><input type="checkbox"/> Report Referred To: _____ | Inspector/Date: <u>Nichols 8/19/05</u><br>Inspector/Date: _____<br>Inspector/Date: _____<br><input type="checkbox"/> Daily Report<br><input type="checkbox"/> Review at Next Inspection |
|--|---|

3. REPORT EVALUATION

|  |  |
|--|--|
| <input checked="" type="checkbox"/> Description of Event<br><input checked="" type="checkbox"/> Levels of RAM Involved<br><input checked="" type="checkbox"/> Cause of Event | <input checked="" type="checkbox"/> Corrective Actions<br><input checked="" type="checkbox"/> Calculations Adequate<br><input type="checkbox"/> Additional Information Requested from Licensee |
|--|--|

4. MANAGEMENT DIRECTIVE 8.3 EVALUATION NA

|  |   |
|--|---|
| <input type="checkbox"/> Release w/Exposure > Limits<br><input type="checkbox"/> Repeated Inadequate Control<br><input type="checkbox"/> Exposure 5x Limits<br><input type="checkbox"/> Potential Fatality<br><input type="checkbox"/> If any of the above are involved:<br><input type="checkbox"/> Considered Need for IIT | <input type="checkbox"/> Deliberate Misuse w/Exposure > Limits<br><input type="checkbox"/> Pkgng Failure > 10 rads/hr or Contamination > 1000x Limits<br><input type="checkbox"/> Large# Indivs w/Exp > Limits or Medical Deterministic Effects<br><input type="checkbox"/> Unique Circumstances or Safeguards Concerns<br><input type="checkbox"/> Considered Need for AIT |
|--|---|

Decision/Made By/Date: \_\_\_\_\_

5. MANAGEMENT DIRECTIVE 8.10 EVALUATION (additional evaluation for medical events only) NA

|  |
|--|
| <input type="checkbox"/> Timeliness - Inspection Meets Requirements (5 days for overdose / 10 days for underdose)<br><input type="checkbox"/> Medical Consultant Used-Name of Consultant/Date of Report: _____<br><input type="checkbox"/> Medical Consultant Determined Event Directly Contributed to Fatality<br><input type="checkbox"/> Device Failure with Possible Adverse Generic Implications<br><input type="checkbox"/> HQ or Contractor Support Required to Evaluate Consequences |
|--|

6. SPECIAL INSTRUCTIONS OR COMMENTS

Non-Public  
 Public-SISP REVIEW COMPLETE

Inspector Signature: [Signature] Date: \_\_\_\_\_  
 Branch Chief Initials: [Signature] Date: \_\_\_\_\_

**Princeton Technology Center  
Division of Schlumberger Technology Corporation**

20 Wallace Road  
Princeton Junction, NJ 08550  
Phone: (609) 799-1000

**Schlumberger**

RECEIVED  
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2005 SEP 27 AM 9:44

September 27, 2005

Administrator  
U.S. Nuclear Regulatory Commission, Region 1  
475 Allendale Road  
King of Prussia, PA 19406

Subject: Event Notification of Lost Material #41929

This letter is in fulfillment of the requirements of 10CFR Part 20.2201 paragraph (b) to provide a written report following notification of the loss of licensed material under paragraph (a) of the same part.

#### Description of the Licensed Material

The lost material is described fully as 1.3 Curies of Hydrogen-3 as a diatomic gas absorbed onto the titanium plated metal target of a vacuum tube. The tube, or "minitron" as described more fully in the NRC Sealed Sources Registry, License # NR-316-D-101-S, consists of a hollow ceramic cylinder, approximately 5 inches long and 1-inch in dia. closed with a metal bulkhead at one end and metallic closure at the other. The target and filament are contained within the hermetically sealed cylinder and attached to the bulkhead connectors by wires. The minitron, in this case, was mounted in a larger instrument known as a Pulsed Neutron Generator (PNG). The PNG is a metal cylinder approximately 30 inches long and 1.5 inches in diameter, containing the minitron and additional high voltage electronics. The PNG was stuck, partially withdrawn, inside a well-logging tool, approximately 10 feet in length and slightly larger in diameter. The tool was being returned to the Princeton Technology Center, PTC for repair.

#### Circumstances of the Loss

The radioactive material was being transferred under the licensing authority of the State of Texas; license number L01833, to Schlumberger's manufacturing facility, PTC in Princeton Junction, NJ, and license number 29-08636-02. The tool was packaged in a 12-foot length of 2-inch diameter PVC pipe, capped at each end, marked and labeled according to DOT and NRC instruction, and delivered to the Federal Express Ground facility in Webster, Texas on July 11<sup>th</sup>. Schlumberger realized on July 25<sup>th</sup> that the shipment was overdue and Federal Express was contacted to investigate the delivery exception reported on their web-site. Schlumberger was informed on the afternoon of Aug 1<sup>st</sup> that the shipment had been damaged and the contents reported missing. Immediately thereafter on Aug 2<sup>nd</sup>, Schlumberger notified the State of Texas of the missing shipment and was told that since the shipment was tracked outside the State of Texas, the NRC should be notified. A decision was made to report our findings in a forthcoming Aug 19<sup>th</sup> report, which would include the findings of an ongoing investigation by Schlumberger and the NRC into another similar, mishandled shipment by Federal Express Ground.

# Schlumberger

In order to elicit greater cooperation from Federal Express, the President's office of Federal Express corporate in Pittsburg, PA was contacted on August 3<sup>rd</sup> and provided with additional information, including photographs of the contents of the shipment. Federal Express had completed their investigation and Schlumberger was notified on August 17<sup>th</sup> that the shipment could not be found and further investigation had been turned over to Federal Express Corporate Safety. Schlumberger notified Region I of the NRC on August 18<sup>th</sup> in a written summary of our previous investigation and was instructed to call the NRC Operations Center in Washington D.C.

This notification resulted in an immediate, further investigation by the NRC and the State of New Jersey. PTC received an unannounced visit from both NRC Region I and the office of the NJDEP at its facility in Princeton Junction, NJ on August 19<sup>th</sup>. After reviewing the situation and making contact with Schlumberger personnel in Texas to summarize what had occurred thus far. Phone calls were placed to Federal Express and it was only at the insistence of the NJDEP and NRC that the investigating team was granted access to the facilities. Schlumberger's Mike O'Brien, John Nicholson of the NRC, and Richard Petros from the NJDEP proceeded to the Federal Express Ground facility in Hightstown, NJ. All site reviews were accompanied by attorneys from Federal Express. The facility manager of the Hightstown location was interviewed, and additional personnel, which were not available, were identified for follow-up contact. A second visit was made to the Federal Express hub facility in Woodbridge, NJ where the shipment was additionally handled. Interviews were held with additional personnel having knowledge of the shipping and handling procedures for the Federal Express facilities in addition to personnel having specific knowledge of the shipment in question. The investigation team completed walkthroughs of the areas at both facilities where the package had passed, however, the contents of the shipment were not discovered.

A follow-up visit was made on Aug. 22<sup>nd</sup> including Mike O'Brien and Richard Petros of the NJDEP for the purpose completing interviews with personnel who were not available on the 19<sup>th</sup>. In spite of the prearranged visit, certain personnel directly involved with handling of the shipment were unavailable for interview.

Based on the facts that the shipping container as identified at the Hightstown facility was empty and that the contents were not able to be discovered at any point along the path that the shipment had taken at the Federal Express facilities, the focus of our investigation after August 22<sup>nd</sup> turned to possible Texas locations for the material.

Schlumberger notified Region IV of the NRC and the State of Texas that a further investigation into the missing shipment was ongoing. Federal Express was requested to provide access to their Texas facilities on Aug 23<sup>rd</sup>. A visit was scheduled for Aug 25<sup>th</sup>. We were informed on the 24<sup>th</sup> that this further site investigation was on hold because of Federal Express's legal concerns. Unfortunately, soon thereafter, hurricane Katrina disrupted Federal Express operations in the South West which delayed further communication between Schlumberger and Federal Express.

September 14<sup>th</sup> Schlumberger was informed in a letter by a law firm representing Federal Express that Federal Express had completed additional searches and walk-downs of all Federal

Express Ground facilities and trailers used to process or carry the missing shipment in response to our earlier inquiry. This included a search of Federal Express's Utah over-goods storage facility, which is used to store untracked shipments from all the Federal Express companies. The letter states that "FedEx Ground will instruct the involved terminals and the Utah "over goods" facility to forward any additional information about the subject shipment to corporate headquarters and any such information will be promptly transmitted to Schlumberger". No further action is intended.

## Statement of Disposition

It is likely that the material became separated from the PVC container at one of the Federal Express handling facilities in Texas or New Jersey. Separately, the material was not marked to distinguish ownership or to attach it to the shipment. A search of the Federal Express facilities and potential handling locations was conducted by Federal Express. The material has not been located. Assuming a worst case scenario, this material would have been discarded into a sanitary landfill.

## Exposures to Radiation

The radioactive isotope (Hydrogen-3) is an internal hazard. Since any removable contamination on the package prior to shipment was determined to be within DOT safe shipping restriction, there would be no direct exposures of individuals to radiation through the loss of this material. The most likely pathway to human exposure from the lost material is through degradation of the ceramic / stainless steel sealed container and subsequent release of the Hydrogen-3 to the environment. Inside the minitron, the Hydrogen-3 is bound to the titanium metal target. Aside from molecular migration, extreme temperature conditions of several hundred degrees Centigrade would be required to evolve the Hydrogen-3 into gaseous form where it would be subject to oxidation. At that point, Hydrogen-3 would be available for migration into groundwater sources and subsequent uptake. The time for this to occur would likely be on the order of several lifetimes of the Hydrogen-3 isotope (12.3 years), reducing the source-term for subsequent dose models. The potential to deliver a significant dose to persons in unrestricted areas from the release of this material is minimal.

## Recovery

Schlumberger has been in contact with Federal Express regarding this missing shipment since July 25<sup>th</sup>. We have been proactive in the search for the missing material by providing photographs and shipping information regarding the lost shipment and calling on various corporate resources to facilitate the recovery effort. Schlumberger accompanied by representatives of the NRC and NJDEP on August 19<sup>th</sup> and 22<sup>nd</sup> during an onsite investigation of both Federal Express Ground facilities that handled the shipment in the State of NJ. Over the course of this two-day investigation, we were afforded interviews with facility managers and handling personnel and given the opportunity to walk-down the probable path that the minitron took on its way to PTC. No missing shipment was discovered during the course of the further investigation. Subsequent to this investigation, Schlumberger has been in contact with Federal Express authority in Texas. Schlumberger has worked closely with the State of Texas and Region IV of the NRC during the course of this subsequent investigation. We have kept them

# Schlumberger

informed of our findings. Federal Express has conducted a search of their Houston and Webster Texas facilities and their over-goods facility in Utah but did not allow Schlumberger personnel to participate in the search. We are in receipt of a letter indicating the extent of their site investigation and distribution of Schlumberger's photographs for possible identification within their organization. At this point, all active recovery efforts have been completed. Federal Express however remains passively alert to the discovery of this material.

Federal Express personnel have stated in the site interviews conducted during the investigation that the empty shipping container was discovered and discarded on or about July 15<sup>th</sup> in Hightstown, NJ. We are doubtful, based the results of our site investigations at which both the NRC and NJDEP were present, that this disposal included the radioactive material. Positive identification is still possible at one of their locations.

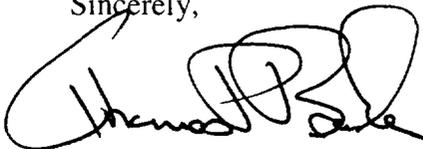
## Preventive Measures

Schlumberger, as a result of these occurrences has issued a ban on the use of Federal Express Ground for transportation of its hazardous materials and dangerous goods. This ban extends to all locations and countries into or through which Schlumberger does business. This ban was put into effect at the beginning of August and announced by written distribution to each Schlumberger office world-wide.

Discontinuing the use of Federal Express Ground services is a short-term solution, and we look forward to utilizing their valuable services in the future. We are relying on our Radioactive Materials Inventory System (RMIS), a global inventory tracking software to provide a long-term solution to the problem. We have invested significantly in this software, and the next release, which is scheduled for October 15, 2005, will include automatic notification to both the sender and recipient of radioactive waste shipments that are overdue. Prompting early investigation into overdue shipments and increasing the accountability for our freight contractors.

We hope this overview is helpful and provides you with a confidence that Schlumberger has acknowledged and understands the problem at hand and has a solution for preventing this type of incident from reoccurring.

Sincerely,



Thomas P. Bracke P.E.  
Radiation Safety Office  
cc: Ray Dickes, Matteo Loizzo

20 Wallace Road  
Princeton Junction, NJ 08550  
Phone: (609) 799-1000

**Attachments - Event History**

- Jul 11 Package is prepared for shipment at Schlumberger's field location and delivered to Federal Express Ground facility in Webster Texas for delivery to Princeton Technology Center in Princeton Junction, NJ.
- Jul 12 Notice of the shipment and the Federal Express tracking number e-mailed to consignee.
- Jul 25 Call placed to consignee from shipper inquiring about the delivery status of the shipment. Consignee confirms that the material has not been received and phones calls are made to determine the status of the shipment. The Federal Express website confirms that a delivery exception has occurred in the shipment at their Hightstown, NJ location. An investigation is launched to discover the exception.
- Aug 1 The shipment is confirmed terminated and the material unaccounted for. Claim #0801508584 is opened regarding the lost shipment.
- Aug 2 The State of Texas is notified of the missing shipment.
- Aug 3 Federal Express Corporate offices in Pittsburg are enlisted to search for the missing material and photographs of the shipment provided to assist in the identification.
- Aug 17 Schlumberger is notified that the shipment is confirmed terminated at Federal Express Ground facility in Hightstown, NJ and any further investigation is being turned over to Federal Express Corporate Safety.
- Aug 18 NRC Region 1 is notified in a written report that radioactive material belonging to Schlumberger has been lost in shipment. We are directed to call the NRC hotline in Washington where contact is made with Peter Snyder at the NRC Operations Center and a formal declaration according to 10 CFR Part 20.2201 is made.
- Aug 19 John Nicholson of Region 1 of the NRC and Richard Petros of the NJDEP visit PTC for a first hand investigation. Mike O'Brien of PTC, John Nicholson, and Richard Petros was made site visits to the Hightstown and Woodbridge Federal Express Ground facilities. Personnel interviews were conducted with the facility managers and other knowledgeable personnel.
- Aug 22 Richard Petros of the NJDEP returns to PTC for a second prearranged visit to the Federal Express Ground facilities and more personnel interviews.

- Aug 23 Schlumberger contacts Federal Express Houston facility to request on-site audit for the missing shipment. A meeting is scheduled for the 25<sup>th</sup>.
- Aug 24 Schlumberger is advised by Federal Express that any future meeting is cancelled pending further legal review.
- Aug 29 Hurricane Katrina makes landfall in Louisiana disrupting businesses and communications in South West.
- Sep 14 Schlumberger receives a reply from Federal Express that all ground facilities and transportation vehicles used to handle the missing shipment have been thoroughly examined including the large over-goods facility in Utah. The material was not found and no further investigation pending