

# RI - DNMS Licensee Event Report Disposition

Licensee:	US Dept of Commerce, NIST		
Event Description:	Lost Am-241 Source		
License No:	SNM-362	Docket No:	07000398
Event Date:		Report Date:	12/17/14
		MLER-RI:	2015-013
		HQ Ops Event #:	50689

1. REPORTING REQUIREMENT

<input type="checkbox"/> 10 CFR 20.1906 Package Contamination <input checked="" type="checkbox"/> 10 CFR 20.2201 Theft or Loss <input type="checkbox"/> 10 CFR 20.2203 30 Day Report <input type="checkbox"/> Other	<input type="checkbox"/> 10 CFR 30.50 Report <input type="checkbox"/> 10 CFR 35.3045 Medical Event <input type="checkbox"/> License Condition
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2. REGION I RESPONSE

<input checked="" type="checkbox"/> Immediate Site Inspection (See Comment) <input type="checkbox"/> Special Inspection <input type="checkbox"/> Telephone Inquiry <input type="checkbox"/> Preliminary Notification/Report <input checked="" type="checkbox"/> Information Entered in RI Log <input type="checkbox"/> Report Referred To:	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">Inspector/Date</td> <td>Miller/January 12, 2015</td> </tr> <tr> <td>Inspector/Date</td> <td></td> </tr> <tr> <td>Inspector/Date</td> <td></td> </tr> </table> <input type="checkbox"/> Daily Report <input type="checkbox"/> Review at Next Inspection	Inspector/Date	Miller/January 12, 2015	Inspector/Date		Inspector/Date	
Inspector/Date	Miller/January 12, 2015						
Inspector/Date							
Inspector/Date							

3. REPORT EVALUATION

<input checked="" type="checkbox"/> Description of Event <input checked="" type="checkbox"/> Levels of RAM Involved <input checked="" type="checkbox"/> Cause of Event	<input checked="" type="checkbox"/> Corrective Actions <input checked="" type="checkbox"/> Calculations Adequate <input type="checkbox"/> Additional Information Requested from Licensee
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4. MANAGEMENT DIRECTIVE 8.3 EVALUATION

*N/A*

☐ Release w/Exposure > Limits  
☐ Repeated Inadequate Control  
☐ Exposure 5x Limits  
☐ Potential Fatality

☐ Deliberate Misuse w/Exposure > Limits  
☐ Pkging Failure > 10 rads/hr or Contamination > 1000x Limits  
☐ Large# Indivs w/Exp > Limits or Medical Deterministic Effects  
☐ Unique Circumstances or Safeguards Concerns

If any of the above are involved:

☐ Considered Need for IIT  
☐ Considered Need for AIT

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

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

*N/A*

☐ Timeliness - Inspection Meets Requirements (5 days for overdose / 10 days for underdose)  
☐ Medical Consultant Used-Name of Consultant/Date of Report: \_\_\_\_\_  
☐ Medical Consultant Determined Event Directly Contributed to Fatality  
☐ Device Failure with Possible Adverse Generic Implications  
☐ HQ or Contractor Support Required to Evaluate Consequences

6. SPECIAL INSTRUCTIONS OR COMMENTS

*discussed*  
 The loss was identified during the above inspection as needing a written LER.

<input type="checkbox"/> Non-Public <input checked="" type="checkbox"/> Public-SUNSI REVIEW COMPLETE	Inspector Signature: <u>Blahell for SC</u> Branch Chief Initials: <u>Blahell</u>	Date: <u>7/15/15</u> Date: <u>7/15/15</u>
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**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Institute of Standards and Technology**  
Gaithersburg, Maryland 20899-

January 16, 2015

Mr. Daniel Dorman  
Regional Administrator, Region I  
U.S. Nuclear Regulatory Commission  
2100 Renaissance Boulevard, Suite 100  
King of Prussia, PA 19406-2713

License No. SNM-362  
Docket # 70-398  
TAC No. L32643

Subject: Licensee Event Report Number 50689, "Lost Am-241 Source"

Dear Mr. Dorman,

The attached report addresses the reporting requirements in 10 CFR 20.2201(b)(1)-(2) pursuant to NIST's event report to the NRC Operations Center on December 17, 2014.

The event involved missing SNM-362 licensed material in a quantity greater than 10 times that specified in 10 CFR 20, Appendix C – Quantities of Licensed Material Requiring Labeling. As detailed further in the attached report, the event did not involve any significant occupational dose or exposure to any individual in excess of the limits in 10 CFR 20.1301 – Dose Limits for Individual Members of the Public.

NIST also provided courtesy notifications to NRC Region I and the SNM-362 Project Manager at NRC Headquarters on December 16, 2014, and discussed the corrective actions taken and planned with NRC inspectors from Region I during a NIST site visit on January 12, 2015.

The attached report provides (1) a description of the licensed material involved, (2) a description of the circumstances under which the loss occurred, (3) the probable disposition of the licensed material, (4) the evaluation of potential exposures to individuals, (5) actions to recover the material, and (6) measures adopted to ensure against recurrence.

Thank you for your attention to this letter and report. If you have further questions about this report, please contact the NIST Radiation Safety Officer, Mr. Thomas O'Brien, at 301-975-5800 or [thomas.obrien@nist.gov](mailto:thomas.obrien@nist.gov).

Sincerely,

Richard F. Kayser  
Chief Safety Officer  
National Institute of Standards and Technology  
100 Bureau Drive  
Gaithersburg, MD 20899-1730  
Email: [richard.kayser@nist.gov](mailto:richard.kayser@nist.gov); Phone: 301-975-4502

cc: T. D. Naquin, Project Manager, NMSS/FCSE/FMB  
A.K. Thompson, NIST IRSC Chairman

**NIST**

As required by 10 CFR 20.2201(b), this written report is submitted as the follow-up to our December 17, 2014 telephone notification of a missing Am-241 source (Event # 50689).

**Description of the licensed material involved, including kind, quantity, and chemical and physical form:**

A NIST Standard Reference Material (SRM) # 4904N-G-109. This SRM is an electro-plated 2.931 kBq (as of May 16, 1986) Am-241 source that is used for calibration purposes. The Am-241 is plated on a 0.6 cm diameter platinum foil which is cemented onto a 2.54 cm diameter stainless steel disk.



**Description of the circumstances under which the loss or theft occurred:**

In support of a radioactive material inventory process, a special effort had been initiated to identify radioactive materials that were no longer useful to researchers. During that effort, the container for the Am-241 SRM was sent to the radiation safety office as an unwanted source. The radiation safety office performed measurements to verify that the declared activity of the source corresponded with the radiation fields measured. When no response was detected, and the container was examined more closely, a note was found indicating that the source was inside a scientific instrument called a vacuum chamber.

Interviews with personnel familiar with the use of the source led to the identification of the location of the vacuum chamber. This vacuum chamber had been out of service for many years. Upon inspection of the chamber, the source was found to not be present.

**Statement of disposition, or probable disposition, of the licensed material involved:**

Further discussions with personnel familiar with the use of this source indicated that there were occasions that upon conclusion of the work, sources were disposed of as radioactive waste. Records of radioactive waste shipments and material transfers were reviewed and no record was found specific to the disposal of this SRM. However, it is possible that this material was included in a waste manifest for various items of the same radionuclide. Therefore, probable disposition of the source was as radioactive waste without its source container.

**Exposures of individuals to radiation, circumstances under which the exposures occurred, and the possible total effective dose equivalent to persons in unrestricted areas:**

This material event involves a "Less than IAEA Category 3 source" level of radioactive material. This type of source contains a very small amount of radioactive material that is unlikely to cause any permanent injury. Based on NUREG 1400 and a release fraction of  $1\text{E-}6$ , the possible total effective dose equivalent to persons in unrestricted areas would have been less than 1 mrem.

**Actions that have been taken, or will be taken, to recover the material:**

Extensive effort has been made to locate the source by looking in locations where it could have been used or stored and by interviewing key personnel. Future material inventory efforts will include a specific "look-out" for this particular source.

**Procedures or measures that have been, or will be, adopted to ensure against a recurrence of the loss or theft of licensed material:**

The radiation safety training materials have been revised to provide additional emphasis on adequate labeling of containers and the importance of verification that the information accurately reflects the contents of such containers.

Measures recently adopted to be performed while conducting radioactive material inventories, such as confirmation that a source is present either by direct visual observation or by detecting a radiation response commensurate with that expected for a source, helped in the identification of this empty container and will likely help prevent recurrence.