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ORG: ESHDIV

Status: Approved
Date: 06/28/2017 03:39:04 PM

JSA
THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY
12000 Jefferson Avenue
Newport News, VA 23606
Phone: (757) 269-7100

Notable Events 67562

See EH&S Manual Chapter 5200 Appendix T1 Event Investigation and Causal Analysis for Instructions

Title of event

Event Title *

FML-17-0509 Unauthorized Personnel Transported a
DOT Hazardous Material Shipment

[Click here for CATS](#)

Response Owner *

Kris Burrows (burrows)

Category *

Agreement / Compliance

Date of Occurrence Time of Occurrence

05/09/2017

00 : 00

Event Location

Shipping and Receiving

Date Notable Event Report is Due* Time Due

06/09/2017

00 : 00

*The Notable Event Report is due to the ESH&Q Reporting Officer with 30 days of the Initial Fact Finding Meeting unless an extension is requested.

Short Summary of Event and/or Injuries *

On May 9, 2017 after discovering that a shipment containing radioactive and corrosive material (Copper(Cu-67)/gallium) that required transport had not been scanned in at the local UPS office, an untrained employee went to the local UPS store and picked up the package and returned the package to the Lab using their personal vehicle (POV). Upon reviewing some DOT guidelines, they made the decision to transport the package to Virginia Commonwealth University (VCU) in Richmond, Virginia against the advice of others. Upon management discovery of this, the employee was asked to return to the lab. The employee returned to the Lab that day and transported the package back to UPS. The package was scanned and delivered to VCU on Wednesday May 10, 2017.

Details of the Event and/or Injuries, including Initial Fact Finding Meeting information: determine the chain of events and timeline

The detailed timeline is attached below.

Causal Analysis

Root Cause

A4 Management Problem, B4 Supervisory Methods Less than adequate (LTA), C05 Emphasis on schedule exceed emphasis on methods of doing the job.

Schedule pressure trumped signs to stop and reevaluate the hazards surrounding the delivery of this item without properly planning and consulting with the appropriate SMEs.

Root Cause Corrective Action

Share lessons learned within your department that reinforces the FM&L Manager's expectations that the schedule should not over power the employee's ability to stop and reassess the situation before moving forward. He should also emphasize using a Subject Matter Experts when making decisions that you are not as familiar with.

Evidence of completion: Email stating the topics covered and who attended the meeting.

Target Date

07/31/2017

Action Owner

Rusty Sprouse
(sprouse)

Contributing Cause

A3 Human Performance LTA, B4 Work Practices LTA, C02 Deliberate Violation

Property Manager chose actions against the advice of the SMEs (RadCon FOM) and staff regarding the classification and the manner in which this package could be delivered to the recipient.

Contributing Cause

A3 Human Performance LTA, Rule Based Error, C05 -Situation incorrectly identified or represented resulted in the wrong rule used.

Incorrect Interpretation of the regulations/ Failure to comply with DOT regulations - Training was LTA- In an attempt to expedite the delivery of the package in a timely manner, the Property Manager made an incorrect interpretation of the DOT regulations. Following that interpretation, the Property Manager expedited plans to transport the package.

Contributing Cause Corrective Action

Employee shall complete DOT training.

Evidence of completion: Updated JRT record that shows DOT training is complete

Target Date

7/30/2017

Action Owner

Rusty Sprouse (sprouse)

Contributing Cause

Communication LTA, B4 Verbal Communication LTA, C01 Communication between work groups LTA

When it was discovered that UPS had failed to scan and begin the shipment process, all involved parties were not properly informed of all the details about this shipment.

Contributing Cause Corrective Action

Develop a flowchart or desktop procedure that explains who to call and when to call with regards to planning a shipment for DOT qualified (hazardous and radioactive shipments). Be sure to include when to communicate to the managers and Subject matters experts as well.

Evidence of completion: Approved desktop procedure or flowchart

Target Date

08/31/2017

Action Owner

Christian Whalen (ctwhalen)

Contributing Cause

Human Performance LTA- B2 Rule Based Error, C01 Strong Rule incorrectly chosen over other rules

The Property Manager was so focused on meeting the deadline that he did not request that UPS immediately scan and work to deliver the package.

Extent of Condition Check Not Applicable

Extent of Condition Check *

Does this event involve failed equipment?*

Yes No

Is there similar equipment in other areas?*

Yes No

* If yes, assign extent of condition check to the appropriate DSO(s).

Lessons Learned (Confer with Lessons Learned Coordinator)

Lesson Learned

It is imperative that you rely and utilize our Subject Matter Experts (SMEs) at all times , or make sure that you have adequate training when making such decisions.

Lessons Learned Number

1013

[Click here for Lessons Learned](#)

Lesson Learned

If there are differing professional opinions, it is vital that you stop, reassess the circumstances, identify the objectives and have a collaborative meeting among all involved including the appropriate subject matter experts to develop a new plan of action.

Lessons Learned Number

1013

[Click here for Lessons Learned](#)

Lesson Learned

Schedule pressure does not mean that one should become a "hero", bypassing rules and regulations in order to meet a deadline.

Lessons Learned Number

1013

[Click here for Lessons Learned](#)

Witness Accounts

Shipment Authorization 67274 (https://misportal.jlab.org/railsForms/shipping_authorizations/67274/edit)

Records, Documents, Pictures, and Other References

Hazard Classification information is attached as pictures

UPDATE ORPS determination: FML-17-0509 Unauthorized Transport of Radioactive Gallium :

June 13, 2017 11:40 am

" Patty/Steve,

After my discussion with Jennifer Willaims, we have decided to change the ORPS determination on FML-17-0509 Unauthorized Gallium Transport.

Group 8 Packaging and Transportation

Significance 4. Violation of applicable Hazardous Materials Regulations requirements for activities listed in 49 CFR Section 171.1(b) performed during the preparation of offsite hazardous materials shipments and discovered during shipment in commerce or at the receiving site.

49 CFR Section 171.1(b) (12) Loading, blocking, and bracing a hazardous materials package in a freight container or transport vehicle.

We will process the notification via the ORPS database. In the meantime, if you have any questions or concerns, feel free to contact me.

Thank you in advance,

--

Tina Johnson
Reporting Officer/ Staff Administrator I

"ORPS Classification - 05-09 Gallium/Cu-67 radioactive material transportation May 10, 2017 1513

Steve and Patty,

We have determined that yesterday's transportation of the Ga/Cu-67 radioactive material does not meet the ORPS reportability criteria of DOE O 232.2A, 8-30-2011 revision.

The applicable and evaluated Groups were:

Group 6 (Contamination / Radiation Control) - disqualified since at no time was there a release, spread or uncontrolled exposure to radiation or contamination.

Group 8 (Packaging and Transportation) - disqualified since there were no transportation incidents or accidents, nor a transfer activity resulting in any type of release; quantities were compliant with VCU's capabilities; there were no shipment preparation violations of 49CFR 171.1b; and there was no unauthorized deviation by the commercial motor carrier."

Role	Person	Group	Phone	Fact Finding	Investigation Team	Notified
Associate Director	Rusty Sprouse (sprouse)	FM	7589	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Lead Investigator	Kris Burrows (burrows)	FMSS	7548	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other	Ed Douberly (dedward)	FMFS	6638	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Subject Matter Expert	Jennifer Williams (jennifer)	ESHDIV	7882	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Subject Matter Expert	David Hamlette (hamlette)	ESHDIV	7219	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	Philip Denny (denny)	SRFOPS	7752	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Involved or Impacted Person	Christian Whalen (ctwhalen)	FMLP	5899	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TJSO Observer	Patty Hunt (phunt)	DOE	7039	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Associate Director	Mary Logue (logue)	ESHDIV	7447	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Emergency Notifications Made (Subsequent to the Event)

Emergency Notification	Date	Time
Fire, Rescue & Emergency Medical: (9-911)	<input type="text"/>	00 : 00
Guard Post: x5822; 269-5822	<input type="text"/>	00 : 00
Occupational Medicine: 269-7539	<input type="text"/>	00 : 00
ESH&Q Reporting Officer: 876-1750	05/09/2017	00 : 00
Crew Chief: 630-7050	<input type="text"/>	00 : 00
Industrial Hygiene: 269-7863	<input type="text"/>	00 : 00
Other: TJSO Patty Hunt	05/10/2017	00 : 00

Documentation of Findings

Notable Event Number	FML-17-0509
CATS Number Click here for CATS	NE-2017-04
Lessons Learned Number Click here for Lessons Learned	1013
ORPS Number	SC--TJSO-JSA-TJNAF-2017-0003
NTS Number	N/A
CAIRS Entry	N/A
DOE Cause Code	A4 Management Problem, B4 Supervisory Methods Less than adequate (LTA), C05 Emphasis on schedule exceed emphasis on methods of doing the job.
ISM Code	Perform Work Within Controls

Event Worksheet

Attachments

- [DOT reg.png](#)
- [4D_shipmentsurvey.pdf](#)

Shipping label Gallium.pdf**Signatures**

Investigation Team Members, Affected Division Managers, ESH&Q Reporting Officer: It is asked that you review and provide comments to this document to the Lead Investigator (denoted on Page 1). Your comments will be reviewed and incorporated as appropriate. Thank you for your consideration in this matter.

Investigation Signed By: Kris Burrows on 06/12/2017 04:50:15 PM
Team

Investigation Signed By: Ed Douberly on 06/13/2017 08:12:07 AM
Team

Investigation Signed By: Philip Denny on 06/20/2017 07:31:48 AM
Team

Associate Signed By: Mary Logue on 06/20/2017 10:38:12 AM
**Director /
Department
Manager**

Associate Signed By: Rusty Sprouse on 06/20/2017 10:59:20 PM
**Director /
Department
Manager**

HPF-SUR-001	Rev: 4	07/16/2012	RADIATION CONTROL DEPARTMENT RADIOLOGICAL SURVEY FORM		Page <u>1</u> of <u>1</u>
Location Bldg 90	Accelerator Operating Conditions N/A	Instrument: _____ Serial #: <u>2130</u> Calibration Due: <u>6/6/2017</u>	Survey Number N/A	RWP	2017-J003

Reason for Survey: **Release survey performed on Gallium sample package prior to DOT shipment(SA 67274).**

LEGEND

All readings in mR/hr whole body (unless annotated otherwise)

--- Denotes posted area

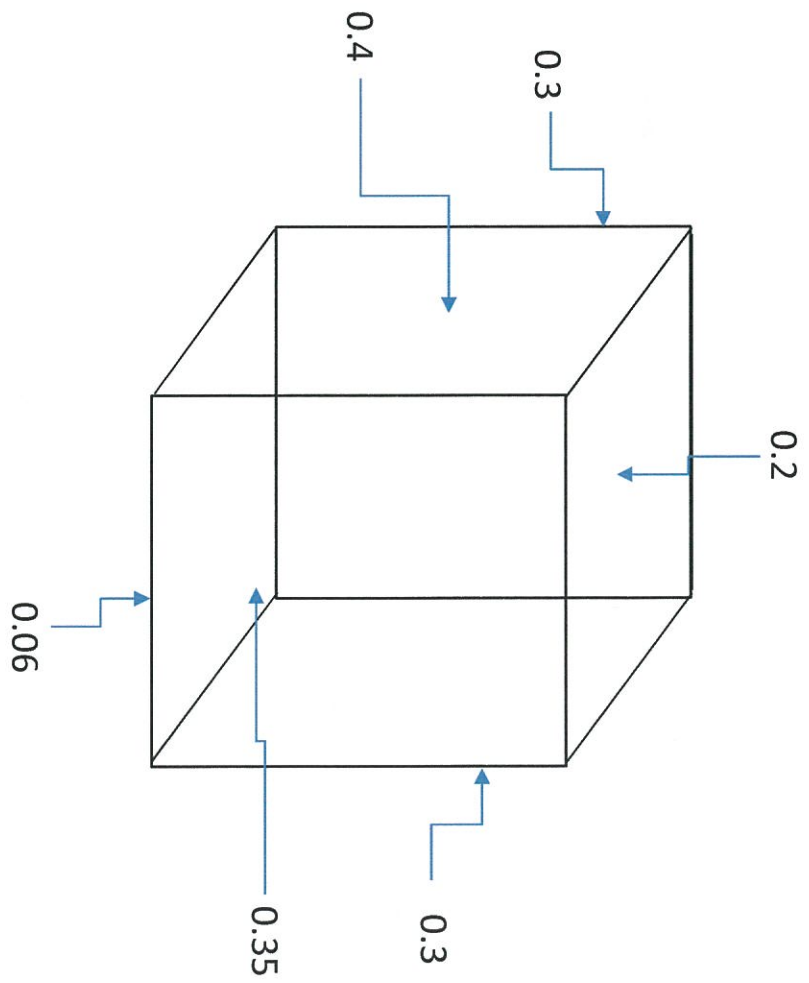
Ⓝ Denotes smear location (refer to page 2 for results)

☐ Contact dose rate
☐ Whole Body dose rate
☐ Item description

▨ Denotes area not surveyed

Approved Abbreviations
RA – Radiation Area
HRA – High Radiation Area
CA – Contamination Area

For Beam Enclosure Entry Surveys	
<input checked="" type="checkbox"/>	Full survey, all areas posted
<input type="checkbox"/>	Partial survey with continuous surveillance
<input type="checkbox"/>	Partial survey with exclusion zone(s) posted
Comments:	
Background levels .005mrem/hr	



Target capsule in Silflex



Gallium in 4G package



Final shipping package

Performed By (Print): David Hamlette	Date: 5/8/2017	Crew Chief Review (Print): N/A	Date: N/A	RCD Review (Print): Robert Danforth	Date: 5/8/2017
Sign: <i>[Signature]</i>	Time: 1300	Sign: N/A	Time: N/A	Sign: <i>[Signature]</i>	

APPLY TO PACKAGE

Account Number 2W1509	Emergency Contact Number 757-876-1750	For Air Services Only This shipment is within the limitations prescribed for: (Delete Non-Applicable Mode)	
Reference Number 1Z2W15090348742946	ER Registrant Jefferson Laboratory	XXXXX Aircraft	XXXXX Aircraft Only
Hazardous Materials Description and Quantity UN2803, Gallium, 8, III, "Limited Quantity Radioactive Material", 1 Fiberboard Box x 100 g			
For Air Shipments, "I declare that all of the applicable air transport requirements have been met". I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If this shipment contains radioactive material acceptable for passenger aircraft, such material is intended for use in, or incident to, research, medical diagnosis or treatment.		Carrier Use Only	
Signature _____ Date _____		Initials _____	SUC _____
Date _____		Date _____	
Page 1 of 1		1 Package	

Account Number 2W1509	Emergency Contact Number 757-876-1750	For Air Services Only This shipment is within the limitations prescribed for: (Delete Non-Applicable Mode)	
Reference Number 1Z2W15090348742946	ER Registrant Jefferson Laboratory	XXXXX Aircraft	XXXXX Aircraft Only
Hazardous Materials Description and Quantity UN2803, Gallium, 8, III, "Limited Quantity Radioactive Material", 1 Fiberboard Box x 100 g			
For Air Shipments, "I declare that all of the applicable air transport requirements have been met". I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If this shipment contains radioactive material acceptable for passenger aircraft, such material is intended for use in, or incident to, research, medical diagnosis or treatment.		Carrier Use Only	
Signature _____ Date _____		Initials _____	SUC _____
Date _____		Date _____	
Page 1 of 1		1 Package	

HAZARDOUS MATERIALS SHIPPING PAPER

HAZARDOUS MATERIALS SHIPPING PAPER

UPS FILE COPY

HAZARDOUS MATERIALS SHIPPING PAPER

HAZARDOUS MATERIALS SHIPPING PAPER

COPY

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FML-17-0509 Unauthorized Personnel Transported a DOT Hazardous Material Shipment

Event Details:

On April 12, 2017, the Principle Investigator (PI) notified the Industrial Hygiene (IH) Program Manager of a planned experiment involving irradiation of gallium, in the CEBAF accelerator, that would create radioactive Cu-67. The experiment was scheduled to take be complete Sunday May 7, 2017. It was anticipated that 24 hours would be needed for the Cu-67 to have decayed sufficiently so that the sample could safely be removed from the accelerator. As the radioactive half-life for Cu-67 is approximately 3 days, it was imperative that the material reach Virginia Commonwealth University (VCU) in Richmond, Virginia by the day after the sample was removed from the accelerator. The IH Program Manager is a Department of Transportation (DOT) trained Subject Matter Expert (SME) who, along with Radcon Department's DOT trained staff, assisted in the determination of the shipping requirements for the Cu-67

A review of the experiment was conducted in April 14, 2017. The need for the quick transport was noted during the review, but the details of how that would be accomplished was not discussed.

After researching the regulations, on April 20, 2017, the IH Program Manager notified the PI the specific requirements pertaining to this shipment; namely that the Radiation Control (RadCon) involvement would be needed as well. The IH Program Manager emailed the RadCon Field Operations Manager (FOM) on April 24, 2017 confirming that the Gallium shipment would be handled as both a corrosive material and a radioactive material. The package would be shipped as a DOT Class 8 corrosive as the primary marking on outer package and shipping papers, but the limited quantity information would be written on the bill of lading and was required to be completed by a DOT trained person. The RadCon FOM is DOT trained for shipping radiological materials. The IH Program Manager followed up with an e-mail to the RadCon FOM and the Facilities Management & Logistics (FM&L) Shipping and Receiving Clerk ("Shipper") to confirm shipping requirements and to ensure the Shipper (also a DOT trained individual) was properly notified of the shipment requirements.

On April 28, 2017, a meeting held with the IH Program Manager, the RadCon FOM, the PI, and the Accelerator Division Safety Officer to discuss specific packaging requirements and to determine if the shipment met materials of trade (MOT) exemption. Material of trade covers an exemption for certain hazardous materials which can be transported in small quantities as part of a business are subject to less regulation, because of the limited hazard they pose. The Shipper was not part of this discussion at the meeting. After the meeting the IH Program Manager and the RadCon FOM met with the Shipper to explain the need to get the package to VCU in a timely manner. IH Program Manager encouraged the use of YRC rather than FedEx or UPS due to experience with those transported failing to meet transport needs when dealing with hazardous materials.

On May 1, 2017, the IH Program Manager attended mock-up/dry run of removing the isotope capsule from the experiment in the tunnel being conducted by the RadCon department. Packaging of the sample by RadCon staff was discussed at this time.

After additional research, the IH Program Manager determined that because of the radioactive quality of the shipment, the shipment did not meet the MOT exemption. The IH Program Manager verbally reaffirmed this determination with the RadCon FOM on May 1, 2017.

On May 2, 2017, the IH Program Manager discussed the shipment with the Shipper and informed them that the package must be shipped by courier service as it was not MOT exempt.

On May 3, 2017, the IH Program Manager notified the Shipper and the RadCon FOM that they would be away from lab on the scheduled shipment date (May 8, 2017). Safety Data Sheet information, an example of the bill of lading, and information regarding the shipment was provided to the Shipper at that time.

On May 8, 2017 the RadCon FOM notified the Property Manager that he could not transport the package.

Following up on a voiced concern whether FM&L staff were aware of the sensitivity of the delivery, the ESH&Q Deputy Associate Director (AD) notified the FM&L Director via email that the package needed to be at VCU same day or the following day at latest. The FM&L Director, the ESH&Q AD, and the ESH&Q Deputy AD had a follow-up telephone call on the subject. The FM&L Director interpreted this exchange to be that same day delivery was preferable. The FM&L Director spoke to the Property Manager. At that time, he learned that the use of a private courier would cost ~\$1000, which was not acceptable to the PI and that UPS would be used to transport the package. The FM&L Director was under the impression that the backup plan was to use FM&L staff to transport the shipment.

Due to problems associated with the experiment, the test ended a day sooner than originally planned. Therefore, when RadCon staff removed the Gallium/Cu-67 sample from the experiment set-up in the tunnel, 48 hours had passed. RadCon staff packaged the shipment and brought it to Shipping and Receiving on May 8, 2017. The Shipper completed the final paperwork, and UPS picked up the package on May 8, 2017 around 4:00 pm.

On May 9, 2017, the Shipper attempted to use the UPS tracking number to confirm the status of the delivery, but the search was unsuccessful. The Shipper then called the local UPS office and was unable to get any information on the shipment. It is not uncommon for some packages to get delivered before they are scanned. After lunch, the Shipper notified the Property Manager that there was no evidence that the package had left the UPS building. After making phone calls to the local office, the Property Manager took their POV to the UPS office to investigate further.

At the UPS office the Property Manager discovered that the package had not been entered into UPS' system and had not been shipped out. Because of the 3-day radiological half-life of the Cu-67, the shipment to VCU became critical. The Property Manger retrieved the package from UPS. They placed the package on the floor of the front passenger seat of the POV, and pushed the seat forward to secure it, and brought the package back to Shipping and Receiving at Jefferson Lab. The POV did not have valid DOT markings, nor was the Property Manager appropriately trained to handle the package. The Property Manager decided that they would personally transport the package to VCU. The Shipper advised the Property Manager that this was not allowed per DOT regulations. The Property Manager reviewed the DOT regulations and decided that the Shipper and the RadCon FOM were in error and that they were allowed to transport the package. The Property Manager then requested a government vehicle to transport the package. The Property Manager strapped the package into the government vehicle and began transport. Both instances of securing the package were in violation of DOT regulations 49 CFR 171.1b (12), Pre-transportation functions (Loading, blocking, and bracing a hazardous materials package in a freight container or transport vehicle). The Property Manger contacted the VCU Radiation Safety Officer (RSO) while enroute and was told that the RSO would have left for the day by the time the Property Manager reached VCU. The Property Manager decided to take the vehicle home and attempt delivery first thing the following morning. Recognizing that he was not DOT trained, he requested another Shipping and Receiving Staff member to accompany him in the morning.

The Shipper had tried calling the IH Program Manager to discuss the events, finally making contact at 3:38 pm. Upon being informed of the actions taken by the Property Manager, the IH Program Manager contracted the RadCon FOM and together they contacted the ESH&Q AD. The ESH&Q AD, the FM&L Director, RadCon FOM and the IH Program Manager conference-called the Property Manager. Upon confirmation of the Property Manager's plan to transport the package the next day, the FM&L Director instructed the Property Manager to return the package to JLab immediately. The Property Manager complied after returning the package to the UPS office for shipping.

The Fact finding was held the following day (May 10, 2017).

The transportation and handling of this package by an unauthorized, untrained (Radiation Worker I or Hazardous Materials DOT training) employee is a violation of 49CFR 172 Subpart H and violation of 49 CFR 171.1