

**Notable Event Report**

Title of Event			
<b>Event Title:</b>	Brief Exposure to Pungent Odor (oil vapor), Results in Days Away		
<b>Date and Time of Occurrence:</b>	05/16/2016	<b>Notable Event Number:</b>	PHY-16-0516
<b>Event Location:</b>	Hall A	<b>Date Notable Event Report is Due*:</b>	06/16/2016

\*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.

**Summary of Event and / or Injuries, including Initial Fact Finding Meeting information: determine the chain of events and timeline. Use attachment as necessary.**

Superconducting magnets are constructed with a vacuum space between the outer shell and the very cold part of the magnet. This is called the insulating vacuum and it helps to prevent the warmth on the outside of the magnet from reaching the minus 300 degree or so temperature on the inside of the magnet. On May 16, 2016 at approximately 11:00 am a technician was working to remove an insulating vacuum pump out tube in preparation for removing the Q1 (number 1 Quadrupole magnet from a High Resolution Spectrometer). As the tube was removed from its connection on the magnet, the technician observed a strong odor of burnt oil which can backstream from the pump used to establish the insulating vacuum and another plastic-like odor, possibly G10 or Mylar which are used in the construction of these type of magnets. Over the course of the day, the employee experienced a headache, runny nose, scratchy throat, stomach pains, and coughing. The employee was out of work for two days and returned to work on May 19, 2016. He was evaluated by Dr. Chandler on May 20, 2016, at which time he returned to work with no restrictions.

Technicians covered the opening with foil after sensing the odor, and the supervisor instructed the technicians to stay out of the area until Industrial Hygiene (IH) could evaluate. IH was notified and responded to the request on May 18, 2016. (See Results below)

Notes:

Physics Division DSO mentioned that G10 was installed in the vacuum space during construction and vessel was welded after the G10 was installed. An assumption was made that the plastic like odor could likely have been G10 that decomposed during welding.

**Causal Analysis: (Use attachment as necessary)**

<b>Root Cause:</b>	A3 Human Performance LTA, B2 Rule Based Error, CO4 Previous Success in use of rule reinforced continued use of rule. Similar work on this and other magnets without incident gave the workers the confidence to complete without further hazard evaluation.
<b>Contributing Causes:</b> (List as many as apply.)	N/A

Extent of Condition Check	JLab CATS Number	Target Date	Action Owner
<p>When a magnet is pumped on, oil vapors can back stream into the magnet. This can cause a burnt oil smell on an old magnet. During the construction of this magnet G10 was used as an isolator between the super insulation and the welds and was mostly likely burnt at that time. When performing this type of work on super conducting magnets (containing G10 or super insulation and welding the magnet could have burned the insulation or G10) workers shall have a local exhaust to ensure that the area is well ventilated and no one else is potentially exposed to this odor.</p> <p>Evidence of Completion: Email from DSO to all Hall Coordinators recommending this for future work</p>	NE-2016-10-01-01	06/30/2016	Ed Folts
Does this event involve failed equipment?	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>	Is there similar equipment in other areas?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N

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

Corrective Action(s)	JLab CATS Number	Target Date	Action Owner
<p>Conduct a Hall Coordinator Meeting to raise awareness about this event and encourage the sharing of pertinent historical data and IH consultation in the future when performing similar work on superconducting magnets.</p> <p>Evidence of completion: Minutes from the meeting and attendee list.</p>	NE-2016-10-01-02	07/30/16	Ed Folts

Lessons Learned (Confer with Lessons Learned Coordinator) (Use attachment as necessary)	Lessons Learned Number
It is important to recognize your personal limits and not to push yourself beyond those established limits.	954
Small tidbits of historical information about equipment and material used during a build may be helpful to others. Try to share this type of information with others.	954

**Witness Accounts:** (Use attachments as necessary. Box will expand as necessary)

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**Records, Documents, Pictures, and Other References:** (Copy and paste, use attachments or document links as necessary)

**Subject:** Assistance Needed

**Date:** Wed, 18 May 2016 08:09:15 -0400 (EDT)

**From:** Jessie Butler <[jbutler@jlab.org](mailto:jbutler@jlab.org)>

**To:** Jennifer Williams <[jennifer@jlab.org](mailto:jennifer@jlab.org)>

**CC:** Heidi Fansler <[fansler@jlab.org](mailto:fansler@jlab.org)>

Good morning Jen,

I'm writing this email seeking assistance... In Hall A we are preparing to remove the Q1 magnet from the left spectrometer and as part of this preparation we are taken off all unnecessary equipment; one part is to remove the old insulating vacuum lines. In doing this one of the techs noticed a very bad (kind of a burnt) smell when removing the lines but we didn't think much of it. Unfortunately that tech has been out sick for the past two days and I am starting to wonder if the smell contributed to this. It may only be a coincidence but I want to make sure the two are not related so would it be possible for you to come down to the Hall and take some samples of this area to make sure there's no contaminant in the air. For now, we have closed the opening with foil and I have ask all techs to stay out of the area until further notice. FYI, the area is up high so there's no real concern of random unsuspected people walking through this area. Also please be advised that I have a day full of meeting and training so if you are unable to reach me please contact Heidi Fansler @ 349-3460. She is well versed on this situation and will be able to fill you in on all the details.

Jessie Butler  
Physics/Hall-A Work Coordinator  
x5544

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PERFECTION IS OUR GOAL.

Industrial Hygiene's evaluation of the odor:

May 24, 2016

"Tina,

I have reviewed potential decomposition byproducts for super insulation and vacuum oil.

These byproducts would consist of CO, CO<sub>2</sub>, NO<sub>x</sub>, and aldehydes. CO and CO<sub>2</sub> are asphixiants and do not have an odor. NO<sub>x</sub> and aldehydes would have a pungent odor that would be irritating to the eyes and respiratory tract, however I am not able to find an association with these contaminants resulting in nausea and vomiting. It is more likely that exposure to NO<sub>x</sub> and/or an aldehyde would result in coughing, watery eyes, and sore throat.

**Records, Documents, Pictures, and Other References: (Copy and paste, use attachments or document links as necessary)**

It is my opinion that sampling for contaminants would not provide further insight for this one time exposure to the odor.

Jen

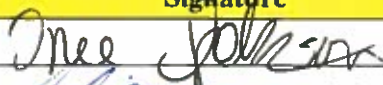

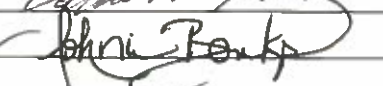
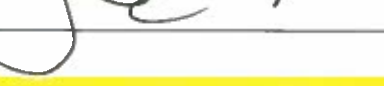
Sent from my iPhone"

Emergency Notifications Made (Subsequent to the Event):	Date	Time
Fire, Rescue & Emergency Medical: (9-911)		
Guard Post: x5822; 269-5822		
Occupational Medicine 269-7539		
ESH&Q Reporting Officer: 876-1750	05/19/2016	~ 1443
Crew Chief 630-7050		
Industrial Hygiene: 269-7863:		
Other:	05/25/2016	~1500


<b>Confirmation Review Distribution:</b> 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) within ____ days. Your comments will be reviewed and incorporated as appropriate. Thank you for your consideration in this matter.
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**Investigation Team Confirmation:**

The below signees, confirm to the best of their knowledge, that the information presented in this document is accurate and complete.

Role	Print	Signature	Date
Lead Investigator	Tina Johnson		6/17/16
SME	Jennifer Williams		6/20/16
DSO	Ed Folts		6/20/16
SME	Johnie Banks		6/20/16

**Acceptance/Acknowledgement of Facts**

	Print	Signature	Date:
Associate Director/ Department Manger	ROLF ENT		06/21/16

Upon confirmation submit document to the ES&H Reporting Officer for completion and distribution.

**Documentation of Findings: (To be Completed by ESH&Q Reporting Officer)**

<b><u>Notable Event Number:</u></b>	PHY-16-0516
<b><u>CATS Number:</u></b>	NE-2016-10-01
<b><u>Lessons Learned Number:</u></b>	954
<b><u>ORPS Number:</u></b>	N/A
<b><u>NTS Number:</u></b>	N/A
<b><u>CAIRS Entry:</u></b>	16-0516
<b><u>DOE Cause Code:</u></b>	A3 Human Performance LTA, B2 Rule Based Error, C04 Previous Success in
<b><u>ISM Code:</u></b>	Provide Feedback and Continuous Improvement. <span style="float: right;">use of rule</span>

Unless otherwise specified the following is to be completed by the Lead Investigator.

**Step 1 Initial Fact-Finding Meeting (To be held as soon as reasonably possible following event(within 24 hours))**

<b>Date:</b>	05/26/2016	1030	<b>Location:</b>	TEDF 2504
<b>Required Attendees: (Print Name)</b>			<b>Optional Attendees: (Print Name) Present</b>	
<b>Lead Investigator:</b>	Tina Johnson		<b>Associate Director:</b>	Rolf Ent Notified
<b>ESH&amp;Q Representative:</b>	Tina Johnson		<b>TJSO Observer:</b>	Patty Hunt Present
<b>Supervisor of involved persons(s):</b>	Jessie Butler		<b>Subject Matter Expert(s), Facility/Equipment Owner as applicable:</b>	
<b>Involved or impacted person(s):</b>	Andrew Lumanog		Jennifer Williams	
			Ed Folts, DSO	
<b>Witness(es):</b>	Heidi Fansler			

<b>Agenda</b> <i>(Ensure the pace of the meeting allows time for accurate note taking.)</i>	<b>√ if Complete</b>
1. Introduction – Provide Event Title, Date and Time of Occurrence, and Location:	√
2. Attendance - Are Required Attendees present.	√
3. Purpose of Initial Fact-Finding meeting.	√
4. Event Reconstruction – Use information to complete Section 3. <u>Summary of Event and/or Injuries</u> below.	√
a. Personnel and organizations involved in the event.	√
b. Conditions and actions preceding the event.	√
c. Chronology (timeline) of the event; and	√
d. Immediate actions taken in response to the event.	√
5. Clarify information – <u>Subject-Matter Expert</u> (SME) confirms work conditions.	√
6. <u>Stop Work</u> or the <u>Tag Out</u> Required? If “Yes” – establish the restart criteria and inform the affected Management chain.	N/A
7. Compensatory Actions Required? If “Yes” determine responsibility and include confirmation documentation.	N/A
8. Records or documentation required to confirm, clarify, or complete information (i.e., work plans, work control documents, photos, etc).	√
9. Other Questions or Concerns: Ask attendees if there are any other questions, concerns, or information that they wish to provide.	√
10. Obtain TJSO Observer feedback on conduct of fact finding meeting and potential improvements.	√

<b>Step 2 Investigation Team:</b>		<b>Date Convened:</b> (Within 24 hours of Fact Finding Meeting.)	05/26/2016 following fact finding	
Role	Name	Department/Group	Phone	
Lead Investigator	Tina Johnson	ESH&Q	7611	
SME	Jennifer Williams	SME/ESH&Q	7882	
DSO	Ed Folts	Physics	7857	
SME	Johnie Banks	ESH&Q	7539	
<u>TJSO Observer</u>	Patty Hunt	TJSO	7039	

Environmental Aspects			
<b>Type of Material Released:</b>		<b>Quantity:</b>	
<b>Source:</b>		<b>Time Flow was Halted or Controlled:</b>	
For Investigation Team (√ All That Apply):			
<input type="checkbox"/> Reportable Quantity	<input type="checkbox"/> Impact Ground/Soil	<input type="checkbox"/> Storm Water Channel/Drain	<input type="checkbox"/> Sanitary Sewer

**Categorization and Reporting**

(To be completed by ESH&Q Reporting Officer within two hours – unless essential information is still pending)

<b>ORPS Determination:</b>	<b>Date:</b> May 26, 2016	<b>Time:</b> 1253
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**CAIRS/ORPS/NTS Determination-PHY-16-0516 Exposure to Unknown Substance**

May 26

**Results in Days Away**

From: Tina Johnson  
 To: Patty Hunt Steve Neilson  
 Cc: Ed Folts Mary Logue

Patty/Steve,

Good Afternoon! On **May 16, 2016** at approximately 11:00 am two technicians were working to remove an old insulating vacuum line in preparation for removing the Q1 tube extension pipe from a pump-out port. As the pipe was removed from its port, the worker smelled a strong odor of burnt oil and G10 insulation. He experienced a reaction to the odor which worsened over the course of the day, and included a headache, runny nose, scratchy throat, stomach pains, and coughing and was out of work for two days. The technician returned to work on **May 19, 2016** and was evaluated by Dr. Chandler on **May 20, 2016**, at which time he returned to work with no restrictions.

The technicians closed the opening with foil, and the supervisor instructed the technicians to stay out of the area until Industrial Hygiene (IH) could evaluate the smell. IH was notified and responded to the request on **May 18, 2016**.

This event is CAIRS reportable as a result of the "days away" from work. This is also a notable event. The Lab will complete the CAIRS entry within the allotted 7day timeframe.

In the meantime if you have any questions or concerns about this matter, feel free to contact me.

Regards,

–

Tina Johnson

Reporting Officer/ Staff Administrator

<b>10 CFR 851 Screen:</b>	<b>Date:</b> May 26, 2016	<b>Time:</b> 1253
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Negative: This event does not meet the voluntary criteria as a discreet programmatic weakness.



**Final Distribution:**

- [ES&H Reporting Officer](#) (Original)  
 Associate Director/Department Manager
- [Division Safety Officer](#)
- Investigation Team Members
- [ESH&Q Liaisons](#)

**Form Revision Summary**

- Revision 1.6 – 02/22/16** – Updated form to reflect extent of condition ensuring it covers failed equipment per MOA
- Revision 1.5 – 10/04/13** – Changed COE to Lessons Learned; updated links.
- Revision 1.4 – 09/06/12** – Qualifying Periodic Review. Clarification of content only.
- Revision 1.3 – 01/31/12** – Updated ESH&Q Reporting Officer assignment from S.Smith to C.Johnson per M.Logue  
 Edited to clarify process steps.
- Revision 1.2 – 10/20/11** – Updated ESH&Q Reporting Officer assignment from J.Kelly to S.Smith per M.Logue.
- Revision 1.1 – 05/24/11** – Edited to clarify process steps.
- Revision 1.0 – 11/23/10** – Updated to reflect current laboratory operations.

ISSUING AUTHORITY	FORM TECHNICAL POINT-OF-CONTACT	APPROVAL DATE	REVIEW DATE	REV.
ESH&Q Division	<a href="#">Tina Johnson</a>	02/22/16	02/22/19	1.6

*This document is controlled as an on line file. It may be printed but the print copy is not a controlled document. It is the user's responsibility to ensure that the document is the same revision as the current on line file. This copy was printed on 6/20/2016*