Office of Health, Safety and Security

Monthly Analysis of Electrical Safety Occurrences

October 2012

Purpose

This analysis resource provides the Department of Energy’s (DOE) electrical safety community with a compilation of, and informal observations on, electrical safety occurrences reported through the Occurrence Reporting and Processing System (ORPS). The topics addressed in this analysis resource are responsive to requests for this information by the electrical safety community, who utilizes this information through monthly conference calls to foster information exchange and continual learning regarding electrical safety occurrences and their prevention across the DOE complex.

Key Observations

The number of electrical safety occurrences increased from 10 in September to 13 in October. This is the second month in 2012 in which no electrical shock was reported. The number of electrical intrusion occurrences remained at one occurrence while the number of lockout/tagout occurrences increased from two to six. In October, workers identified electrical hazards 86 percent of the time, which is an improvement over the 40 percent in September.

Electrical Safety Occurrences

The following sections provide a summary of selected occurrences based upon specific areas of concern regarding electrical safety (e.g., bad outcomes or prevention/barrier failures). The complete list and full report of the occurrence reports is provided in Attachment 2.

Electrical Shock

There were no reported electrical shocks in the month of October, which is a reduction from the six occurrences reported in September. October is the third shock-free month in the last 36 months and the second month this calendar year.

Figure 1 shows a 3-year trend of electrical shocks for the DOE complex. During this period, the average number of electrical shocks has remained below three shocks per month.
Figure 2 shows electrical shocks by worker type. The number of shocks involving electrical workers has slowly increased, while those involving non-electrical workers decreased after 2011. Since 2008, the majority of shocks (about 73 percent) involve non-electrical workers.
Figure 3 shows the number of days since the previous electrical shock for the DOE complex. The longest interval was 61 days (April 16, 2012) and the present interval is 43 days as of October 31.

**Figure 3 - Days since Previous Shock**

### Electrical Intrusion

The number of electrical intrusion occurrences (i.e., cutting/penetrating, excavating, or vehicle/equipment contact of overhead electrical conductors) remained at one for October. In this occurrence, a maintenance electrician saw an arc and heard a "bang" while tightening a screw in a raceway cover. The screw penetrated the insulation of a 480-volt phase, shorting it to ground. The majority of the available energy was prevented from being shorted to ground because the raceway was rated as a 480-volt confinement system and the circuit was protected by an instantaneous-trip circuit breaker. There was no electrical shock.

The number of electrical penetration occurrences average about 1.7 occurrences per month and have shown an increasing trend since October 2011. During that thirteen month period, there have only been four months in which no electrical penetration/cutting occurrences have been reported.

Figure 4 shows a 3-year trend of electrical intrusion occurrences for the DOE complex. During this period we have seen an average of just under 3 occurrences per month (2.9).
In October there were six reported occurrences involving lockout/tagout (LOTO), which is an increase from the two occurrences reported in September. These events are summarized in the following sections.

Occurrences Involving Lockout/Tagout

1. A subcontractor was exposed to 120 volts when he removed a drive motor cover on a malfunctioning rollup door without installing a LOTO or wearing proper personal protective equipment. The work was suspended and notifications were made.

2. An industrial hygiene technician performed air monitoring work on an air handling unit without being required to overlock the unit with their personal authorized worker lock. It was initially believed the technician could perform confined space air monitoring from outside the air handling unit without applying a lock; however, it was later discovered that the electrical heating coils, if energized, would have been a potential electrical shock hazard to the technician while inserting an air monitoring probe.
3. A subcontractor electrician performed a LOTO on a circuit that was not included on a Low Voltage Outage Permit while installing a new transformer. De-energizing the additional circuit resulted in a loss of power to equipment and caused a number of alarms. The electrician was not working on energized circuits.

4. A subcontractor performed maintenance on a commercial coffee machine without the installation of a LOTO. The subcontractor opened an internal circuit breaker to de-energize the coffee machine but did not lock the circuit breaker. Work was immediately stopped and the coffee-making equipment was put in a safe condition.

5. A subcontractor performed work on an electrical system without following LOTO procedures. There was no contact with hazardous energy.

6. The key for an electrical vault LOTO was left on a table next to the lockbox instead of being placed inside the lockbox, during a building electrical outage. Failure to place the electrical vault key in the lockbox was a failure to follow the hazardous energy control program.

Figure 5 shows a 3-year trend of LOTO occurrences for the DOE complex. The monthly average is 4.4 occurrences.

Figure 5 – Three-Year Trend of Lockout/Tagout Occurrences
Occurrences Involving Hazardous Energy Control Procedure Non-Compliances

1. An electrician opened the wrong circuit breaker for a LOTO because of an inaccurate panel schedule, which resulted in a loss of power to an uninterruptable power supply (UPS). Problems were identified in the formality of and attention to detail in the application of Conduct of Operations principles related to: consistent work package instructions; following procedures and permits verbatim; adequacy of pre-job briefs; electrical panel schedules/labeling; and worker questioning attitude. Power was restored to the UPS.

2. Concerns were raised as to whether hazardous energy controls had been implemented or if Non-Destructive Analysis (NDA) personnel were exposed to hazardous energy when they took measurements in casting furnaces. NDA personnel were taking measurements when a maintenance electrician and a production operator told them that the furnaces needed to be energized for post-maintenance purposes. Concerns about hazardous energy control were raised and work was suspended.

Discovery of Uncontrolled Hazardous Energy

1. A worker identified an energized 120-volt circuit at a panel and adjacent relays while performing a safe condition check for a Controlling Organization lockout of an exhaust fan system. Investigators found that the one-line control drawing used to design the tagout boundary did not show an additional source of power; however, the additional power source was noted on other system drawings. The work package was suspended.

2. Workers discovered 124 VAC while performing the Safe Condition Check during the installation of a LOTO to support replacement of a power supply. The activity was stopped and notifications were completed.

3. An electrical short circuit occurred from a 120-volt light switch when a mechanical subcontractor removed parts on a heating, ventilation and cooling (HVAC) unit. The prime contractor had removed electrical power to the work area with the exception of the lighting circuit. The short occurred when the subcontractor removed energized electrical power to the HVAC unit, which caused a short to the conductors.

Electrical Near Miss

In October, there were three occurrences that were considered to be an electrical near miss, which is an increase from the two occurrences last month. One of these occurrences was discussed in the Electrical Intrusions section and the other two were discussed under Hazardous Energy Controls; occurrence number 3 under the Discovery of Uncontrolled Hazardous Energy section and occurrence number 2 under Occurrences Involving Hazardous Energy Control Procedure Non-Compliances section.
Monthly Occurrences Tables

Table 1 shows a breakdown of the outcomes, performance issues, and worker types associated with the electrical safety occurrences for October 2012.

Table 1 - Breakdown of Electrical Occurrences

<table>
<thead>
<tr>
<th>Number of Occurrences</th>
<th>Involving:</th>
<th>Last Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Electrical Shocks</td>
<td>6</td>
</tr>
<tr>
<td>0</td>
<td>Electrical Burns</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>Hazardous Energy Control (LOTO)</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Inadequate Job Planning</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>Inadvertent Drilling/Cutting of Electrical Conductors</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>Excavation of Electrical Conductors</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>Vehicle Intrusion of Electrical Conductors or Equipment</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Electrical Near Misses</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>Electrical Workers</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>Non-Electrical Workers</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Subcontractors</td>
<td>2</td>
</tr>
</tbody>
</table>

NOTE: The numbers in the left-hand column are not intended to total the number of occurrences for the month and are only associated with the items in the center column.

In compiling the monthly totals, the search looked for occurrence discovery dates in this month [excluding Significance Category R (Recurring) reports] and for the following ORPS HQ keywords:

01K – Lockout/Tagout Electrical, 01M – Inadequate Job Planning (Electrical), 08A – Electrical Shock, 08J – Near Miss (Electrical), 12C – Electrical Safety

Table 2 provides a summary of the electrical safety occurrences for CY 2012. The present monthly average increased from last month’s value of 12.7/month. The average number of occurrences a year ago (October 2011) was 11.5/month.

Table 2 - Summary of Electrical Occurrences

<table>
<thead>
<tr>
<th>Period</th>
<th>Electrical Safety Occurrences</th>
<th>Shocks</th>
<th>Burns</th>
<th>Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>September</td>
<td>10</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>August</td>
<td>14</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>July</td>
<td>16</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>June</td>
<td>9</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>May</td>
<td>11</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>April</td>
<td>15</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>March</td>
<td>14</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>February</td>
<td>12</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Period</td>
<td>Electrical Safety Occurrences</td>
<td>Shocks</td>
<td>Burns</td>
<td>Fatalities</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------</td>
<td>--------</td>
<td>-------</td>
<td>------------</td>
</tr>
<tr>
<td>January</td>
<td>14</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2012 total</td>
<td>128 (avg. 12.8/month)</td>
<td>25</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2011 total</td>
<td>136 (avg. 11.3/month)</td>
<td>36</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>2010 total</td>
<td>155 (avg. 12.9/month)</td>
<td>28</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>2009 total</td>
<td>128 (avg. 10.7/month)</td>
<td>25</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>2008 total</td>
<td>113 (avg. 9.4/month)</td>
<td>26</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2007 total</td>
<td>140 (avg. 11.7/month)</td>
<td>25</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>2006 total</td>
<td>166 (avg. 13.8/month)</td>
<td>26</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>2005 total</td>
<td>165 (avg. 13.8/month)</td>
<td>39</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>2004 total</td>
<td>149 (avg. 12.4/month)</td>
<td>25</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 6 shows the distribution of electrical safety occurrences by Secretarial Office.

**Electrical Severity**

The electrical severity of an electrical occurrence is based on an evaluation of electrical factors that include: electrical hazard, environment, shock proximity, arc flash proximity, thermal proximity and any resulting injury(s) to affected personnel. Calculating an electrical severity for an occurrence provides a metric that can be consistently applied to evaluate electrical occurrences across the DOE complex.
**Electrical Severity Scores**

The electrical severity scores (ES) are calculated using Revision 2 of the Electrical Severity Measurement Tool, which can be found on the EFCOG website at [http://www.ef cog.org/wg/esh_es/docs/Electrical_Severity_Measurement_Tool.pdf](http://www.ef cog.org/wg/esh_es/docs/Electrical_Severity_Measurement_Tool.pdf). The 13 occurrences are classified as shown in Table 3. The actual score for each occurrence is provided in Attachment 1.

<table>
<thead>
<tr>
<th>Occurrence Classification</th>
<th>Electrical Severity Score</th>
<th>Number of Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>≥ 1750</td>
<td>0</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>31-1749</td>
<td>2</td>
</tr>
<tr>
<td>LOW</td>
<td>1-30</td>
<td>6</td>
</tr>
<tr>
<td>No Score</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

**Electrical Severity Index**

The Electrical Severity Index (ESI) is a performance metric that was developed to normalize events against organizational work hours. The ESI is calculated monthly and trended. Figure 7 shows a calculated ESI for the DOE complex and Table 4 shows the ESI and how it has changed from the previous month.

**Table 3 – Classification of Electrical Safety Occurrences by ES Score**

<table>
<thead>
<tr>
<th>Occurrence Classification</th>
<th>Electrical Severity Score</th>
<th>Number of Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>≥ 1750</td>
<td>0</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>31-1749</td>
<td>2</td>
</tr>
<tr>
<td>LOW</td>
<td>1-30</td>
<td>6</td>
</tr>
<tr>
<td>No Score</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

**Table 4 - Electrical Severity Index**

<table>
<thead>
<tr>
<th>Category</th>
<th>September</th>
<th>October</th>
<th>Δ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Occurrences</td>
<td>10</td>
<td>13</td>
<td>+3</td>
</tr>
<tr>
<td>Total Electrical Severity</td>
<td>3,500</td>
<td>810</td>
<td>-2690</td>
</tr>
<tr>
<td>Estimated Work Hours</td>
<td>21,240,621*</td>
<td>21,539,387</td>
<td>+298,766</td>
</tr>
<tr>
<td>Category</td>
<td>September</td>
<td>October</td>
<td>Δ</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------</td>
<td>----------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>(19,173,333)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ES Index</td>
<td>32.96* (36.51)</td>
<td>7.52</td>
<td>-25.43</td>
</tr>
<tr>
<td>Average ESI</td>
<td>22.0</td>
<td>21.5</td>
<td>-0.5</td>
</tr>
</tbody>
</table>

* These are estimated CAIRS work hours for September and ES Index based on the estimated hours. The estimated hours and ES Index based on the estimated hours (as reported in September) are shown below in parentheses.

Electrical Severity Index = \( \frac{\Sigma \text{Electrical Severity}}{\Sigma \text{Work Hours}} \times 200,000 \)

Figure 8 shows the ESI with the number of Occurrences instead of Work Hours.

Figure 8 - Electrical Severity Index Compared to Number of Occurrences

The average ESI (21.5) has decreased slightly from last month. The lowest average ESI was 19.2 in June 2010.

Figure 9 shows the number of days since the previous high severity occurrence. The present interval is 547 days as of October 31. The previous longest interval was 181 days in 2009.
Electrical workers typically have the fewest number of occurrences. Following a spike in September of 2,320, the ES score for electrical workers dropped to 60, while non-electrical workers ES scores decreased from 1,180 to 750. The average ES scores for the 18 month period are 1,181 for electrical workers and 1,436 for non-electrical workers.
Summary of Occurrences by Severity Band

For the interval October 2011 through October 2012 (current month and the past 12), Figures 11 and 12 summarize occurrences by severity band and month of discovery date by percentage of total occurrences in month and number of occurrences in month.

Figure 11 - Occurrences by Electrical Severity Band (Percentage)

![Occurrences by Electrical Severity Band (%)](image)

What can be seen from the previous two charts is that the number of occurrences with High electrical severity scores has remained at zero for the past 14 months and that the number of occurrences with Medium scores have decreased as the number of Low and zero severity occurrences increased.

Figure 12 - Occurrences by Electrical Severity Band (Number)

![Occurrences by Electrical Severity Band (#)](image)
**Medium and Low Severity with Trend**

Figure 13 focuses on the Medium and Low severity data series for October 2011 through October 2012. Trend lines are included for each, using a 3-month moving average.

The 3-month moving average shows a decreasing trend for Medium severity occurrences and an increasing trend for Low severity occurrences. A higher percentage of Low severity occurrences is preferred.

**Additional Resources**

**Electrical Safety Blog**
http://hsselectricalsafety.wordpress.com/

**Electrical Safety Wiki**
http://electricalsafety.doe-hss.wikispaces.net/home

**EFCOG Electrical Safety Subgroup**
http://www.efcog.org/wg/esh_es/index.htm

**Center of Excellence for Electrical Safety**
http://www.lanl.gov/safety/electrical/

**Contact**

Glenn S. Searfoss  
Office of Analysis, HS-24  
Phone: 301-903-8085  
Email: glenn.searfoss@hq.doe.gov
## Electrical Safety Occurrences – October 2012

<table>
<thead>
<tr>
<th>No</th>
<th>Report Number</th>
<th>Event Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EE-GO--NREL- NREL-2012-0015</td>
<td>A subcontractor was exposed to 120V when he removed a motor cover without wearing proper PPE or installing a LOTO.</td>
</tr>
<tr>
<td>2</td>
<td>EM-RL--CPRC- CENTPLAT-2012- 0001</td>
<td>An energized 120V circuit was found in a panel during a LOTO safe condition check.</td>
</tr>
<tr>
<td>3</td>
<td>EM-RL--CPRC-GPP 2012-0004</td>
<td>Work performed inside air handling unit without placing authorized worker lock.</td>
</tr>
<tr>
<td>4</td>
<td>EM-RL--CPRC- SNF-2012-0012</td>
<td>Workers discovered 124 VAC while performing the zero energy check.</td>
</tr>
<tr>
<td>5</td>
<td>NA--LASO- LANL-CMR-2012- 0011</td>
<td>An electrician opened the wrong breaker for a LOTO because of an inaccurate panel schedule.</td>
</tr>
<tr>
<td>6</td>
<td>NA--LASO- LANL-TA55-2012- 0034</td>
<td>An electrician saw an arc and heard a bang when a screw penetrated a 480V conductor on an electrical raceway cover.</td>
</tr>
<tr>
<td>7</td>
<td>NA--LSO-GOAK- LSO-2012-0001</td>
<td>A subcontractor performed a LOTO on a circuit that was not included on a low voltage permit.</td>
</tr>
<tr>
<td>8</td>
<td>NA--SS-SNL- NMFAC-2012- 0007</td>
<td>A short circuit occurred from a 120V light switch while removing parts on a HVAC unit.</td>
</tr>
<tr>
<td>9</td>
<td>NA--YSO-BWXT- Y12NUCLEAR- 2012-0021</td>
<td>Concerns were raised as to whether hazardous energy controls had been implemented for work in electric furnace.</td>
</tr>
<tr>
<td>10</td>
<td>NE-ID--BEA-STC- 2012-0002</td>
<td>A subcontractor worked on a commercial coffee machine without a LOTO.</td>
</tr>
<tr>
<td>11</td>
<td>NE-ID--GOID- RESL-2012-0001</td>
<td>A subcontractor worked on an electrical system without following LOTO procedures.</td>
</tr>
</tbody>
</table>
### Attachment 1

<table>
<thead>
<tr>
<th>No</th>
<th>Report Number</th>
<th>Event Summary</th>
<th>SHOCK</th>
<th>BURN</th>
<th>ARCF</th>
<th>LOTO</th>
<th>PLAN</th>
<th>EXCAV</th>
<th>CUT/D</th>
<th>VEH</th>
<th>SC</th>
<th>RC</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>SC--BSO-LBL-OPERATIONS-2012-0012</td>
<td>A subcontractor electrician opened a panel that contained exposed, energized 120V contacts without permission.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>2E(3)</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>13</td>
<td>SC--PNSO-PNNL-PNNL-BOPER-2012-0017</td>
<td>The key for an electrical vault LOTO was left on the table next to the lock box instead of being placed inside the lock box.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>4</td>
<td>2E(3)</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Key**

(1) ARCF = significant arc flash, (2) LOTO = lockout/tagout, (3) PLAN = job planning, (4) EXCAV = excavation/penetration, (5) CUT/D = cutting or drilling, (6) VEH = vehicle or equipment intrusion, (7) SC = ORPS significance category, (8) RC = ORPS reporting criteria, (9) ES = electrical severity

**ES Scores:** High is $\geq 1750$, Medium is 31-1749, and Low is 1-30
## Electrical Safety Occurrences – October 2012

<table>
<thead>
<tr>
<th>No</th>
<th>Report Number</th>
<th>Event Summary</th>
<th>EW(1)</th>
<th>N-EW(2)</th>
<th>SUB(3)</th>
<th>HFW(4)</th>
<th>WFI(5)</th>
<th>PPE(6)</th>
<th>70E(7)</th>
<th>VOLT(8)</th>
<th>C/T(9)</th>
<th>NEUT(10)</th>
<th>NM(11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EE-GO--NREL-NREL-2012-0015</td>
<td>A subcontractor was exposed to 120V when he removed a motor cover without wearing proper PPE or installing a LOTO.</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>EM-RL--CPRC-CENTPLAT-2012-0001</td>
<td>An energized 120V circuit was found in a panel during a LOTO safe condition check.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>EM-RL--CPRC-GPP-2012-0004</td>
<td>Work performed inside air handling unit without placing authorized worker lock.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>EM-RL--CPRC-SNF-2012-0012</td>
<td>Workers discovered 124 VAC while performing the zero energy check.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>NA--LASO-LANL-CMR-2012-0011</td>
<td>An electrician opened the wrong breaker for a LOTO because of an inaccurate panel schedule.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>NA--LASO-LANL-TA55-2012-0034</td>
<td>An electrician saw an arc and heard a bang when a screw penetrated a 480V conductor on an electrical raceway cover.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>NA--LSO-GOAK-LSO-2012-0001</td>
<td>A subcontractor performed a LOTO on a circuit that was not included on a low voltage permit.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>NA--SS-SNL-NMFAC-2012-0007</td>
<td>A short circuit occurred from a 120V light switch while removing parts on a HVAC unit.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>NA--YSO-BWXT-Y12NUCLEAR-2012-0021</td>
<td>Concerns were raised as to whether hazardous energy controls had been implemented for work in electric furnace.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>NE-ID--BEA-STC-2012-0002</td>
<td>A subcontractor worked on a commercial coffee machine without a LOTO.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>NE-ID--GOID-RESL-2012-0001</td>
<td>A subcontractor worked on an electrical system without following LOTO procedures.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Attachment 1

<table>
<thead>
<tr>
<th>No</th>
<th>Report Number</th>
<th>Event Summary</th>
<th>EW(1)</th>
<th>N-EW(2)</th>
<th>SUB(3)</th>
<th>HFW(4)</th>
<th>WFH(5)</th>
<th>PPE(6)</th>
<th>70E(7)</th>
<th>VOLT(8)</th>
<th>C/I(9)</th>
<th>NEUT(10)</th>
<th>NM(11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>SC--BSO-LBL-OPERATIONS-2012-0012</td>
<td>A subcontractor electrician opened a panel that contained exposed, energized 120V contacts without permission.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>SC--PNSO-PNNL-PNNLBOPER-2012-0017</td>
<td>The key for an electrical vault LOTO was left on the table next to the lock box instead of being placed inside the lock box.</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td>8</td>
<td>5</td>
<td>6</td>
<td>2X</td>
<td>11</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Key**

(1) EW = electrical worker, (2) N-EW = non-electrical worker, (3) SUB = subcontractor, (4) HFW = hazard found the worker, (5) WFH = worker found the hazard, (6) PPE = inadequate or no PPE used, (7) 70E = NFPA 70E issues, (8) VOLT = H (>600) L(≤600), (9) C/I = Capacitance/Inductance, (10) NEUT = neutral circuit, (11) NM = near miss
1) Report Number: EE-GO--NREL-NREL-2012-0015 After 2003 Redesign

Secretarial Office: Energy Efficiency and Renewable Energy
Lab/Site/Org: National Renewable Energy Laboratory
Facility Name: National Renewable Energy Laboratory
Subject/Title: Service subcontractor exposed to electrical shock hazard
Date/Time Discovered: 10/23/2012 10:30 (MTZ)
Date/Time Categorized: 10/23/2012 17:52 (MTZ)
Report Type: Notification
Report Dates: 10/25/2012 17:36 (ETZ)

Significance Category: 3
Reporting Criteria: 2E(2) - Any unexpected discovery of an uncontrolled electrical hazardous energy source (e.g., live electrical power circuit, etc.). This criterion does not include discoveries made by zero-energy checks and other precautionary investigations made before work is authorized to begin.

Cause Codes:
ISM: 4) Perform Work Within Controls
Subcontractor Involved: Yes
Vortex

Occurrence Description: On October 23, 2012, a service subcontractor was called to NREL to repair a malfunctioning rollup door in the Research Support Facility (RSF). An employee from the subcontractor company was dispatched to NREL and checked in with Site Operations. Upon his arrival at NREL, the subcontractor employee evaluated the door and determined that he would need a ladder and tools to perform his work. After escorting the subcontractor to retrieve his ladder and tools, his escort, a Site Operations maintenance technician, was temporarily called away.

When the Site Ops worker returned after 5 to 10 minutes, the subcontractor informed the Site Ops worker that he needed to cut through the drywall in order to access the door's gearbox. The Site Ops worker escorted the subcontractor to meet with the Building Area Engineer (BAE)
to request a penetration permit. When the maintenance technician, BAE, and subcontractor convened a short time later at the door site to review the work and issue the penetration permit, it was discovered that the cover had been removed from the door's driver (motor), which was located above the ceiling tiles on the opposite side of the door from the gearbox. The subcontractor had removed the cover in order to visually inspect the condition of the driver and see if any components had burnt out. At no time did the worker attempt to perform any work on the driver. The service subcontractor had been authorized to work at NREL since July 2010.

The subcontractor did not control the electrical hazard presented by the uncovered driver box either via use of required PPE or by locking and tagging out the system prior to opening the cover (PPE is also required for lockout/tagout in order to confirm zero voltage). As a result, he was exposed to 120 volts of electricity. At the time of the exposure, he was standing on the second rung of a ladder, approximately two feet off the ground. No injuries or property damage resulted from this occurrence.

Upon discovery of the uncovered driver box, the BAE suspended all work on the door and notified NREL's Environment, Health and Safety Office. NREL requested, via its Contracts & Business Services Office, that the subcontractor conduct an incident investigation of this occurrence, to include causal analysis and corrective actions. NREL will review the submitted incident investigation report and will meet with the subcontractor's management prior to resuming work on this activity. NREL has also initiated an internal investigation of the occurrence.

**Cause Description:**

<table>
<thead>
<tr>
<th>Operating Conditions:</th>
<th>Normal Operating Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity Category:</td>
<td>Maintenance</td>
</tr>
<tr>
<td>Immediate Action(s):</td>
<td>1. The Building Area Engineer (BAE) suspended all work on the door.</td>
</tr>
<tr>
<td></td>
<td>2. The BAE notified the Environment, Health and Safety Office of the occurrence.</td>
</tr>
<tr>
<td></td>
<td>3. NREL requested, via its Contracts &amp; Business Services Office, that the subcontractor conduct an incident investigation of this occurrence, to include causal analysis and corrective actions.</td>
</tr>
<tr>
<td></td>
<td>4. NREL will review the subcontractor's incident investigation report and will review the report with the subcontractor's management prior to resuming work on this activity.</td>
</tr>
<tr>
<td></td>
<td>5. An NREL incident investigation has been initiated as well.</td>
</tr>
</tbody>
</table>

**FM Evaluation:**

<table>
<thead>
<tr>
<th>DOE Facility Representative Input:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOE Program Manager Input:</td>
</tr>
<tr>
<td>Further Evaluation is Yes.</td>
</tr>
</tbody>
</table>
**Required:**
Before Further Operation? No
By Whom:
By When:

**Division or Project:** Site Operations

**Plant Area:** South Table Mountain

**System/Building/Equipment:** Research Support Facility

**Facility Function:** Laboratory - Research & Development

**Corrective Action:**

**Lessons(s) Learned:**

**HQ Keywords:**
01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical)
08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance
11G--Other - Subcontractor
12I--EH Categories - Lockout/Tagout (Electrical or Mechanical)
14E--Quality Assurance - Work Process Deficiency
14G--Quality Assurance - Procurement Deficiency

**HQ Summary:**
On October 23, 2012, a subcontractor was exposed to 120 volts when he removed a drive motor cover on a malfunctioning rollup door at the Research Support Facility without wearing proper personal protective equipment or installing a lockout/tagout. The subcontractor removed the cover when his escort was called away for approximately 5 to 10 minutes. The condition was discovered when the subcontractor, escort and Building Area Engineer went to the rollup door to conduct a review before issuing a penetration permit that was necessary to repair the door. Work was suspended and notifications were made.

**Similar OR Report Number:**

**Facility Manager:**

<table>
<thead>
<tr>
<th>Name</th>
<th>JORDAN, MAUREEN Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>(303) 275-3248</td>
</tr>
<tr>
<td>Title</td>
<td>EHS OFFICE DIRECTOR</td>
</tr>
</tbody>
</table>

**Originator:**

<table>
<thead>
<tr>
<th>Name</th>
<th>LITTRELL, BOBBIJO R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>(303) 275-3230</td>
</tr>
<tr>
<td>Title</td>
<td>COMPLIANCE ASSURANCE SPECIALIST</td>
</tr>
</tbody>
</table>

**HQ OC Notification:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Person Notified</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

**Other Notifications:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Person Notified</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/23/2012</td>
<td>17:52 (MTZ)</td>
<td>Event Notification</td>
<td>DOE/NREL</td>
</tr>
</tbody>
</table>

**Authorized Classifier(AC):**

2)Report Number: [EM-RL--CPRC-CENTPLAT-2012-0001](#) After 2003 Redesign
Attachment 2

<table>
<thead>
<tr>
<th>Secretarial Office:</th>
<th>Environmental Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab/Site/Org:</td>
<td>Hanford Site</td>
</tr>
<tr>
<td>Facility Name:</td>
<td>Central Plateau Remediation Project</td>
</tr>
<tr>
<td>Subject/Title:</td>
<td>Energized Circuit Found During Safe Condition Check</td>
</tr>
<tr>
<td>Date/Time Discovered:</td>
<td>10/24/2012 10:14 (PTZ)</td>
</tr>
<tr>
<td>Date/Time Categorized:</td>
<td>10/24/2012 11:20 (PTZ)</td>
</tr>
<tr>
<td>Report Type:</td>
<td>Notification/Final</td>
</tr>
<tr>
<td>Report Dates:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Notification</td>
</tr>
<tr>
<td></td>
<td>Initial Update</td>
</tr>
<tr>
<td></td>
<td>Latest Update</td>
</tr>
<tr>
<td></td>
<td>Final</td>
</tr>
<tr>
<td>Significance Category:</td>
<td>4</td>
</tr>
<tr>
<td>Reporting Criteria:</td>
<td>2E(3) - Any failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout, hazardous energy control program).</td>
</tr>
<tr>
<td>Cause Codes:</td>
<td></td>
</tr>
<tr>
<td>ISM:</td>
<td>3) Develop and Implement Hazard Controls</td>
</tr>
<tr>
<td>Subcontractor Involved:</td>
<td>No</td>
</tr>
<tr>
<td>Occurrence Description:</td>
<td>While performing a safe condition check for a Controlling Organization lockout of the B Plant Exhaust Fan System, an energized 120 volt circuit was identified at the TB-1 panel and adjacent relays. Investigation found that the one-line controlled drawing used to design the tagout boundary did not show an additional source of power. The additional power source was noted on other system drawings.</td>
</tr>
<tr>
<td>Cause Description:</td>
<td></td>
</tr>
<tr>
<td>Operating Conditions:</td>
<td>Maintenance</td>
</tr>
<tr>
<td>Activity Category:</td>
<td>Maintenance</td>
</tr>
<tr>
<td>Immediate Action(s):</td>
<td>Work was stopped. The tag was cleared and the Exhaust Fan System restored to service. The work package was suspended. A critique was conducted.</td>
</tr>
<tr>
<td>FM Evaluation:</td>
<td></td>
</tr>
<tr>
<td>DOE Facility Representative Input:</td>
<td></td>
</tr>
<tr>
<td>DOE Program Manager Input:</td>
<td></td>
</tr>
<tr>
<td>Further Evaluation is Required:</td>
<td>No</td>
</tr>
<tr>
<td>Division or Project:</td>
<td>Decommissioning Waste Fuels &amp; Remediation Services</td>
</tr>
<tr>
<td>Plant Area:</td>
<td>200E</td>
</tr>
<tr>
<td>System/Building/Equipment:</td>
<td>B Plant</td>
</tr>
</tbody>
</table>
Facility Function: Nuclear Waste Operations/Disposal
Corrective Action:
Lessons(s) Learned:
HQ Keywords:
01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control
01M--Inadequate Conduct of Operations - Inadequate Job Planning (Electrical)
12C--EH Categories - Electrical Safety
14D--Quality Assurance - Documents and Records Deficiency
14E--Quality Assurance - Work Process Deficiency

HQ Summary: On October 24, 2012, an energized 120 volt circuit was identified at the TB-1 panel and adjacent relays while performing a safe condition check for a Controlling Organization lockout of the B Plant Exhaust Fan System. Investigation found that the one-line control drawing used to design the tagout boundary did not show an additional source of power. The additional power source was noted on other system drawings. Work was stopped, the tag was cleared and the Exhaust Fan System was restored to service. The work package was suspended. A critique was conducted.

Similar OR Report Number:

Facility Manager:
Name: Corriell, Darin R
Phone: (509) 376-1743
Title: Facility Manager

Originator:
Name: POOLE, M ELIZABETH
Phone: (509) 373-0522
Title:

HQ OC Notification:
Date | Time | Person Notified | Organization
--- | --- | --- | ---
NA | NA | NA | NA

Other Notifications:
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Person Notified</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/24/2012</td>
<td>10:14 (PTZ)</td>
<td>D. Corriell</td>
<td>CPS&amp;M</td>
</tr>
<tr>
<td>10/24/2012</td>
<td>10:14 (PTZ)</td>
<td>M. Edington</td>
<td>CPS&amp;M</td>
</tr>
<tr>
<td>10/24/2012</td>
<td>11:55 (PTZ)</td>
<td>R.V. Johnson</td>
<td>DOE RL</td>
</tr>
<tr>
<td>10/24/2012</td>
<td>12:25 (PTZ)</td>
<td>G. Trump</td>
<td>MSA ONC</td>
</tr>
</tbody>
</table>

Authorized Classifier(AC):

Secretarial Office: Environmental Management
Lab/Site/Org: Hanford Site
Facility Name: Groundwater Protection Project
On 10/4/2012, a new preventive maintenance work package (G2-12-60421, "200W P&T 6 Month Chemical Room Air Handling Unit Inspection") for the 200 West Pump and Treat (P&T) chemical room air handling unit was executed. Prior to work beginning, the air handling unit was electrically isolated using an 8 criteria lockout/tag out (LOTO). Following completion of maintenance work package, a post job engineering review was completed. During the review, it was discovered that an Industrial Hygiene Technician (IHT) had performed air monitoring work for the air handling unit without being required to over lock the unit with their personal authorized worker lock (AWL).

Initially it was believed the IHT could perform confined space air monitoring from outside of the air handling unit (the confined space boundary) without applying an AWL since there was no potential exposure to any known hazard. In response to questions raised by the work team, an agreement was reached to conduct a follow-up engineering evaluation of other possible hazardous energy sources. During the course of the review, it was discovered that the electrical heating coils, if energized, would have been a potential electrical shock hazard to the IHT via the extended reach air monitoring probe.

Since the air handling unit had been electrically isolated by the 8 criteria lockout, at no time during the preventive maintenance and air monitoring activities were any personnel exposed to a hazardous energy source.
**Cause Description:**

**Operating Conditions:** Normal - Conducting Planned Maintenance of Air Handling Unit

**Activity Category:** Maintenance

**Immediate Action(s):**
1) Initiated standard event notification process.
2) Suspended further maintenance of air handling units pending evaluation of similar air handling units and modification of maintenance work package(s).
3) Scheduled critique of event.

**FM Evaluation:**

**DOE Facility Representative**

**Input:**

**DOE Program Manager**

**Input:**

**Further Evaluation is Required:** No

**Division or Project:** CHPRC Soil & Groundwater Remediation Project

**Plant Area:** 200 West

**System/Building/Equipment:** 200 West Pump & Treat / Building 289-T

**Facility Function:** Environmental Restoration Operations

**Corrective Action:**

**Lessons(s) Learned:** Lessons Learned to be developed as part of the causal analysis.

**HQ Keywords:**

01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical)
01N--Inadequate Conduct of Operations - Inadequate Job Planning (Other)
01O--Inadequate Conduct of Operations - Inadequate Maintenance
08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance
12B--EH Categories - Conduct of Operations
14E--Quality Assurance - Work Process Deficiency

**HQ Summary:** On October 4, 2012, an Industrial Hygiene Technician (IHT) performed air monitoring work on an air handling unit without being required to over lock the unit with their personal authorized worker lock (AWL). A new preventive maintenance work package for inspecting the air handling unit had been executed and the unit had been electrically isolated using a lock out/tag out. It was initially believed the IHT could perform confined space air monitoring from outside the air handling unit without applying an AWL since there was no potential exposure to any known hazard. Personnel discovered that the electrical heating coils, if energized, would have been a potential electrical shock hazard to the IHT via the extended reach air monitoring probe during a follow-up engineering evaluation of other possible hazardous energy sources. A critique was scheduled.

**Similar OR Report Number:**

**Facility Manager:** Name | BARRETT, WILLIAM F.

Secretarial Office: Environmental Management
Lab/Site/Org: Hanford Site
Facility Name: Spent Nuclear Fuels Project
Subject/Title: Voltage Discovered During Safe Condition Check at Cold Vacuum Drying Facility
Date/Time Discovered: 10/16/2012 15:00 (PTZ)
Date/Time Categorized: 10/16/2012 15:32 (PTZ)
Report Type: Update
Report Dates:

<table>
<thead>
<tr>
<th>Notification</th>
<th>10/18/2012</th>
<th>16:53 (ETZ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Update</td>
<td>10/19/2012</td>
<td>18:10 (ETZ)</td>
</tr>
<tr>
<td>Latest Update</td>
<td>10/19/2012</td>
<td>18:10 (ETZ)</td>
</tr>
</tbody>
</table>

Significance Category: 3

Reporting Criteria:

2E(2) - Any unexpected discovery of an uncontrolled electrical hazardous energy source (e.g., live electrical power circuit, etc.). This criterion does not include discoveries made by zero-energy checks and other precautionary investigations made before work is authorized to begin.

2E(3) - Any failure to follow a prescribed hazardous energy control
process (e.g., lockout/tagout, hazardous energy control program).

Cause Codes:
ISM: 3) Develop and Implement Hazard Controls
Subcontractor Involved: No
Occurrence Description: On 10/16/12, at the Cold Vacuum Drying Facility, during installation of Lockout Tagout (LOTO) V-12-017 to support replacement of a power supply in CP-411, per Work Package 1K-11-10295, voltage (124VAC) was discovered to be present during the Safe Condition Check. The activity was stopped, notifications were completed, and the event was screened and categorized. A critique was scheduled for the following day to fully evaluate the event.

Update 10/19/12: Based on continuing investigation and review, this event is being upgraded to a Group 2, Subgroup E, Hazardous Energy Control Electrical Category 2, SC-3; Any unexpected discovery of an uncontrolled electrical hazardous energy source (e.g., live electrical power circuit, etc.). This criterion does not include discoveries made by zero-energy checks and other precautionary investigations made before work is authorized to begin. No additional immediate actions were taken or required. Discovery associated with the upgrade in significance category was 10/19/12, 1045 Hours, and categorization was completed on 10/19/12, at 1234 Hours.

Cause Description:
Operating Conditions: Normal operations. Work was underway to install a LOTO in support of power supply replacement.
Activity Category: Normal Operations (other than Activities specifically listed in this Category)
Immediate Action(s): Work was stopped, notifications were made, the event was screened and categorized, and a critique was scheduled for the following day.
FM Evaluation: The facility is in a safe condition, with no hazard to the workers, environment, or facility.

DOE Facility Representative Input:
DOE Program Manager Input:
Further Evaluation is Required: Yes.
Before Further Operation? No
By Whom: Facility Engineering
By When:

Division or Project: CHPRC/D&D/100K Area
Plant Area: 100K Area
System/Building/Equipment: Power Supply in CP-411/CVD Facility
Facility Function: Nuclear Waste Operations/Disposal
Corrective Action:

Lessons(s) Learned:

HQ Keywords:
01M--Inadequate Conduct of Operations - Inadequate Job Planning (Electrical)
08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance
12C--EH Categories - Electrical Safety
14E--Quality Assurance - Work Process Deficiency

HQ Summary:

On October 16, 2012, during the installation of a lockout/tagout to support replacement of a power supply in CP-411 at the Cold Vacuum Drying Facility, workers discovered 124 VAC while performing the Safe Condition Check. The activity was stopped, notifications were completed, and the event was screened and categorized. A critique was scheduled to fully evaluate the event.

Similar OR Report Number:

Facility Manager:

<table>
<thead>
<tr>
<th>Name</th>
<th>R. K. Nissen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>(509) 373-4547</td>
</tr>
<tr>
<td>Title</td>
<td>Manager, K West Facility</td>
</tr>
</tbody>
</table>

Originator:

<table>
<thead>
<tr>
<th>Name</th>
<th>FEIL, RHONDA K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>(509) 373-4551</td>
</tr>
<tr>
<td>Title</td>
<td>ADMINISTRATIVE SPECIALIST</td>
</tr>
</tbody>
</table>

HQ OC Notification:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Person Notified</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Other Notifications:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Person Notified</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/16/2012</td>
<td>15:10 (PTZ)</td>
<td>R. K. Nissen</td>
<td>CPRC/D&amp;D</td>
</tr>
<tr>
<td>10/16/2012</td>
<td>15:32 (PTZ)</td>
<td>D. H. Splett</td>
<td>RL/OOD</td>
</tr>
<tr>
<td>10/19/2012</td>
<td>11:50 (PTZ)</td>
<td>D. H. Splett</td>
<td>RL/OOD</td>
</tr>
<tr>
<td>10/19/2012</td>
<td>12:15 (PTZ)</td>
<td>R. K. Nissen</td>
<td>CPRC/D&amp;D</td>
</tr>
</tbody>
</table>

Authorized Classifier(AC):

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Secretarial Office:</td>
<td>National Nuclear Security Administration</td>
</tr>
<tr>
<td>Lab/Site/Org:</td>
<td>Los Alamos National Laboratory</td>
</tr>
<tr>
<td>Facility Name:</td>
<td>Chemistry &amp; Metallurgy Research</td>
</tr>
<tr>
<td>Subject/Title:</td>
<td>Management Concern: Formality of and Attention to Detail of Conduct of Operations Principles in Work Processes</td>
</tr>
<tr>
<td>Date/Time Discovered:</td>
<td>10/02/2012 10:45 (MTZ)</td>
</tr>
<tr>
<td>Date/Time Categorized:</td>
<td>10/02/2012 15:45 (MTZ)</td>
</tr>
<tr>
<td>Report Type:</td>
<td>Notification/Final</td>
</tr>
</tbody>
</table>
Report Dates:

<table>
<thead>
<tr>
<th></th>
<th>Notification</th>
<th>Initial Update</th>
<th>Latest Update</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>10/05/2012</td>
<td>10/05/2012</td>
<td>10/05/2012</td>
<td>10/05/2012</td>
</tr>
</tbody>
</table>

Significance Category: 4

Reporting Criteria: 10(2) - An event, condition, or series of events that does not meet any of the other reporting criteria, but is determined by the Facility Manager or line management to be of safety significance or of concern for that facility or other facilities or activities in the DOE complex. The significance category assigned to the management concern should be based on an evaluation of the potential risks and impact on safe operations. (1 of 4 criteria - This is a SC 4 occurrence)

Cause Codes: 5) Provide Feedback and Continuous Improvement

ISM: No

Subcontractor Involved: No

Occurrence Description: MANAGEMENT SYNOPSIS

On Tuesday, October 2, 2012, at 1045 hours, at the Los Alamos National Laboratory (LANL) Chemistry and Metallurgy Research (CMR) Facility, a Facility Operator (FO) reported to the Operations Center (OC) that he had completed an Independent Verification of a lock out tag out (LO/TO) for an elevator repair activity in Wing 9. The OC Shift Operations Supervisor (SOS) responded that they had received a corresponding indication that the Wing Uninterruptable Power Supply (UPS) had lost power. The elevator repair isolations should not have affected any other systems in the Wing. The OC SOS directed that the work activity be paused, the LO/TO be removed and power restored. The event was initially categorized as non-reportable.

On Wednesday, October 3, 2012, a critique was held where it was determined that the event did not constitute a LO/TO violation, nor were workers exposed to electrical hazardous energy as work had not begun at the time of discovery of the mis-placed LO/TO. However, the CMR Facility Operations Director (FOD) designee determined that there was a management concern regarding the formality of and attention to detail with the application of Conduct of Operations principles. At 1010 hours the FOD designee re-categorized the event from non-reportable to 10(2) significance category 4.

The formality of and attention to detail in the application of Conduct of Operations principles were related to: consistent work package instructions; following procedures and permits verbatim; adequacy of pre-job briefs; electrical panel schedules/labeling; and worker questioning attitude. Corrective actions addressing these concerns will be managed in
the LANL Performance Feedback and Issues Management System (PFITS); reference PFITS issue number 2012-3682.

There was no impact to the health and safety of personnel, the environment, or the program as a result of this event.

EVENT SEQUENCE
On Monday, October 1, 2012, at approximately 0800 hours, a LANL Maintenance and Site Services (MSS) crew reported to the CMR OC to begin maintenance work on the elevator in Wing 9, where it had been reported that the elevator doors were not closing. The OC SOS issued locks based on the provided Attachment B and two completed red tags, indicating a LO/TO of the CDD (the local disconnect location). However, the locks did not leave the OC, as work performed that day did not require de-energized work.

On Tuesday, October 2, 2012, at approximately 0800 hours, a different MSS crew reported to the CMR OC to continue the maintenance work. Again, the OC SOS issued locks based on the provided Attachment B and two completed red tags, indicating a LO/TO of the MCC (an upstream disconnect location); specifically, circuit 4.

A MSS elevator electrician placed a lock and tag on the elevator CDD, which was identified in the MSS Task Steps document included in the work package. A CMR FO performed the required independent verification of the LO/TO and noticed that the tag and Attachment B identified the MCC as the disconnect point. The MSS electrician located the MCC panel, but was unable to identify the exact location of circuit 4 as the circuits were not marked and there was not a panel schedule available for reference. At some point in the past, the word “elevator” had been written below a circuit, and the MSS electrician interpreted this as identifying circuit 4 and applied the lock and tag to that circuit.

At 1045 hours, the CMR FO reported to the OC that he had completed an Independent Verification of a LO/TO for elevator repair activities. The OC SOS responded that they had received a corresponding indication that the Wing UPS had lost power. The elevator repair isolations should not have affected any other systems in the Wing. The OC SOS directed that the work activity be paused, the LO/TO be removed and power restored.

At approximately 1050 hours, power was restored to the UPS and all work on the elevator maintenance was paused.

EXTENT OF CONDITION
The FOD designee assessed the need for an Extent of Condition (EOC), in accordance with DOE Order 232.2, Occurrence Reporting and Processing
of Operations Information, and determined one was warranted for this event. The EOC results are not available at this time. EOC results will be documented in the local LANL Performance Feedback Improvement Tracking System (PFITS) Record Number PFITS-2012-3682.

**Cause Description:**

**Operating Conditions:** Normal

**Activity Category:** Maintenance

**Immediate Action(s):**
1. The lock and tag was removed and power restored to the UPS.
2. Work was paused.
3. The work package will be reviewed to correct discrepancies.
4. The correct LO/TO isolation point will be identified on a new Attachment B.
5. A panel schedule will be placed in the MCC box in W9.

**FM Evaluation:**

DOE Facility Representative

Input:

DOE Program Manager

Input:

Further Evaluation is No Required:

Division or Project: CMR Operations

Plant Area: TA-3 bldg. 29

**System/Building/Equipment:** Wing 9 Elevator

**Facility Function:** Laboratory - Research & Development

**Corrective Action:**

**Lessons(s) Learned:**

**HQ Keywords:**
01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous)
01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control
01E--Inadequate Conduct of Operations - Operations Procedure Noncompliance
01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical)
01M--Inadequate Conduct of Operations - Inadequate Job Planning (Electrical)
01P--Inadequate Conduct of Operations - Inadequate Oral Communication
01R--Inadequate Conduct of Operations - Management issues
07C--Electrical Systems - Power Outage
08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance
12B--EH Categories - Conduct of Operations
14D--Quality Assurance - Documents and Records Deficiency
14E--Quality Assurance - Work Process Deficiency
HQ Summary: On October 3, 2012, the Chemistry and Metallurgy Research Facility Operations Director designee determined that there was a management concern regarding the formality of and attention to detail with the application of Conduct of Operations principles following a critique of an occurrence resulting in an uninterruptable power supply (UPS) loss of power after the wrong circuit was de-energized for an elevator repair in Building 29. The formality of and attention to detail in the application of Conduct of Operations principles were related to: consistent work package instructions; following procedures and permits verbatim; adequacy of pre-job briefs; electrical panel schedules/labeling; and worker questioning attitude. Power was restored to the UPS and all work on the elevator maintenance was paused. The work package will be reviewed to correct discrepancies and the correct isolation point will be identified.

Similar OR Report Number:

<table>
<thead>
<tr>
<th>Facility Manager:</th>
<th>Name</th>
<th>Steve Antimary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Phone</td>
<td>(505) 664-0473</td>
</tr>
<tr>
<td></td>
<td>Title</td>
<td>Facility Operations Director Designee</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Originator:</th>
<th>Name</th>
<th>TANNER, KIMBERLI K</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Phone</td>
<td>(505) 665-8197</td>
</tr>
<tr>
<td></td>
<td>Title</td>
<td>OCCURRENCE INVESTIGATOR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HQ OC Notification:</th>
<th>Date</th>
<th>Time</th>
<th>Person Notified</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Notifications:</th>
<th>Date</th>
<th>Time</th>
<th>Person Notified</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10/02/2012</td>
<td>16:10 (MTZ)</td>
<td>Randi Allen</td>
<td>NNSA</td>
</tr>
</tbody>
</table>

| Authorized Classifier(AC): | Kimberli Tanner | Date: 10/05/2012 |


<table>
<thead>
<tr>
<th>Secretarial Office:</th>
<th>National Nuclear Security Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab/Site/Org:</td>
<td>Los Alamos National Laboratory</td>
</tr>
<tr>
<td>Facility Name:</td>
<td>Plutonium Proc &amp; Handling Facility</td>
</tr>
<tr>
<td>Subject/Title:</td>
<td>Unexpected Discovery of Electrical Energy: Electrical Arc Caused by Tightening a Screw in a Raceway Cover</td>
</tr>
<tr>
<td>Date/Time Discovered:</td>
<td>10/22/2012 10:10 (MTZ)</td>
</tr>
<tr>
<td>Date/Time Categorized:</td>
<td>10/22/2012 11:11 (MTZ)</td>
</tr>
<tr>
<td>Report Type:</td>
<td>Final</td>
</tr>
<tr>
<td>Report Dates:</td>
<td></td>
</tr>
<tr>
<td>Notification</td>
<td>10/24/2012 09:34 (ETZ)</td>
</tr>
<tr>
<td>Initial Update</td>
<td>11/16/2012 10:28 (ETZ)</td>
</tr>
<tr>
<td>Latest Update</td>
<td>11/16/2012 10:28 (ETZ)</td>
</tr>
</tbody>
</table>
Significance Category: 3
Reporting Criteria: 2E(2) - Any unexpected discovery of an uncontrolled electrical hazardous energy source (e.g., live electrical power circuit, etc.). This criterion does not include discoveries made by zero-energy checks and other precautionary investigations made before work is authorized to begin.

Cause Codes: A7B1C01 - Other problem; External Phenomena; Weather or ambient conditions LTA
ISM: 6) N/A (Not applicable to ISM Core Functions as determined by management review.)
Subcontractor Involved: No
Occurrence Description: MANAGEMENT SYNOPSIS: On Monday, October 22, 2012, at 1010, at Technical Area 55, Building 400 (TA-55-400), a Maintenance and Site Services, Central Shop Operations (MSS-CS) electrician (E1) observed an arc and heard a "bang" while tightening a screw in an electrical raceway cover. The electrician did not experience any indication of electric shock. The screw penetrated the insulation of one phase of a 480 volt system. The phase shorted to ground. The raceway was rated as a 480 volt confinement system and the circuit was protected by an instantaneous circuit breaker which prevented the majority of the energy available from being shorted to ground. Analysis indicated there was no hazard to the electrician because of 1) the confinement system and 2) the instantaneous breaker function. The TA-55 radiological liquid waste (TA-55-RLW) Operations Manager categorized the event as Group 2E(2) significance level 3.

BACKGROUND: The air ventilation system in TA-55-400 was being balanced in order to meet the requirements of negative air pressure in the laboratories. Part of the process was the identification and elimination of leak paths. The electrical raceways were identified as air leak paths because of a combination of loose cover screws and gaps between the covers and raceway. In order to correct the problem the screws holding the covers on were to be tightened and the gaps in the raceways were to be taped. The IWD developed for construction was still in use for the electrical system and covered tightening cover screws and taping air gaps. Personal Protective Equipment (PPE) for the job included a hard had, safety glasses, dielectric gloves, and steel toed shoes.

E1 stated that it is not common to work on raceway covers once construction is completed. However, there was no reason to suspect that the cover screws might cause an electrical hazard. Work started on Monday, October 22, 2012. E1 and his partner were working together tightening screws in the raceway cover. E1 stated there were no indications that the conduits in the raceway were out of position, i.e., no missing screws and/or bulging covers. At approximately 1010 E1
tightened a cover screw approximately one half turn, observed an arc, and heard a "bang."

**Cause Description:**
Apparent causal analysis and the DOE Causal Analysis Tree as described in the DOE Occurrence Reporting Causal Analysis Guide (DOE G 231.1-2) were used to identify the causes for this event. Apparent causes are identified as the most probable causes of an event or condition that management has the control to fix and for which effective recommendations for corrective actions can be generated.

The electrical event was not caused by poor work practices, component failure, failure to follow IWD, nor poor supervision. The use of the 6’ X 6” X 36” sheet metal pull box, with its cover plate screw that contacted the conductor, with an EMT raceway was the correct application. Job hazards were reviewed and the electricians removed all the TA55-400 raceway covers using 8 cal/cm2 suits, dielectric gloves, head covers, and face blast shields. E1 stated the conductors were all within standards. No deficiencies were identified. The only recommendation developed was that, as a good practice, raceway cables be tie-wrapped together in the raceway after pulling and before the cover plate is installed.

The DOE cause code which best describes this condition is Other Problem (A7), No Cause Code is Applicable (B4), No cause is known for this event (C01), A7B1C01.

Although no corrective action opportunities were identified a lessons learned will be developed and issued LANL-wide describing the event and the recommendation to tie-wrap raceway cables after pulling and before the cover plate is installed.

Corrective action No. 1 was to develop and issue a lessons learned.

No ISM deficiencies were identified.

**Extent of Condition:** Job hazards were reviewed and the electricians removed all the TA55-400 raceway covers using 8 cal/cm2 suits, dielectric gloves, head covers, and face blast shields. E1 stated the conductors were all within standards. No deficiencies were identified.

**Operating Conditions:** Tightening raceway cover screw

**Activity Category:** Normal Operations (other than Activities specifically listed in this Category)

**Immediate Action(s):** The electrician and his partner immediately stopped work and notified their foreman and the TA-55-400 operations center. The area was isolated with caution tape and system subject matter experts analyzed the situation and identified the tripped circuit. The system served by the system had uninterruptable power supply and diesel generator backup. There was no loss of electrical service to the
system. Zero voltage was confirmed on all three phases and the line was repaired. Initial review of the incident indicated the conductor was located on the side of the raceway and the raceway cover screw penetrated the insulation after approximately one half turn of the screw. No installation deficiencies or material flaws were identified. A critique was held at 1530 on the day of the event. The work control process was reviewed and approved before work resumed.

**FM Evaluation:** Although this event did not impact the workers or the facility, it did re-emphasize the need to plan for the unexpected. The workers recognized potential hazards and were protected from them.

**DOE Facility Representative**

Input:  
**DOE Program Manager**

Input:  
**Further Evaluation is Required:** No

**Division or Project:** TA55-RLW  
**Plant Area:** TA-55  
**System/Building/Equipment:** TA-55-400 electrical raceway  
**Facility Function:** Plutonium Processing and Handling

**Corrective Action 01:**

| Target Completion Date: 11/16/2012 | Actual Completion Date: 11/16/2012 |

REVISION OR EXTENSION OF THIS ACTION REQUIRES FACILITY OPERATIONS DIRECTOR APPROVAL.

Title: Issue Lessons Learned

Action: Develop and issue lessons learned

Deliverable: Copy of lessons learned 2012-36

Responsible Organization: TA55-DO

Target or Completed Due Date: 11/08/2012  
See PFITS 2012-4007, action #2 for action closure and objective evidence.

This action addresses cause code A7B1C01 which is identified in the causal analysis.

NOTE: This action has been closed in ORPS based on the documented completion of the Performance Feedback Improvement Tracking System (PFITS) entry.
Lessons(s) Learned:
HQ Keywords: 07D--Electrical Systems - Electrical Wiring
08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical)
12C--EH Categories - Electrical Safety
14L--Quality Assurance - No QA Deficiency
HQ Summary: On October 22, 2012, a Maintenance and Site Services, Central Shop Operations (MSS-CS) electrician observed an arc and heard a "bang" while tightening a screw in an electrical raceway cover at Technical Area 55, Building 400. The electrician did not experience an electric shock. The screw penetrated the insulation of one phase of a 480-volt system, which shorted to ground. The majority of the available energy was prevented from being shorted to ground because the raceway was rated a 480-volt confinement system and the circuit was protected by an instantaneous circuit breaker. Work was stopped and appropriate notifications were made.

Similar OR Report Number: 1. None.
Facility Manager: Name Clifford Kirkland  
Phone (505) 606-0576  
Title TA-55-RLW Operations Manager
Originator: Name HUNSINGER, MARK W  
Phone (505) 665-1496  
Title OCCURRENCE INVESTIGATOR
HQ OC Notification:  
Date Time Person Notified Organization  
NA NA NA NA
Other Notifications:  
Date Time Person Notified Organization  
10/22/2012 11:21 (MTZ) Ron Fontana LASO/FR
Authorized Classifier(AC): Mark Hunsinger Date: 11/16/2012
Secretarial Office: National Nuclear Security Administration
Lab/Site/Org: Lawrence Livermore National Lab.
Facility Name: Livermore Site Office
Subject/Title: Subcontractor's Failure to Follow Low Voltage Outage (LVO) Permit Requirements and Procedures
Date/Time Discovered: 10/17/2012 14:00 (PTZ)
Date/Time Categorized: 10/18/2012 10:30 (PTZ)
Report Type: Notification/Final
Report Dates: Notification 10/24/2012 12:30 (ETZ)
Significance Category: 4
Reporting Criteria: 2E(3) - Any failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout, hazardous energy control program).

Cause Codes:
ISM:
1) Define the Scope of Work
4) Perform Work Within Controls

Subcontractor Involved: Yes
Cable Links Construction Group

Occurrence Description: On Wednesday, 10/17/12, at approximately 2:00 pm, a Cable Links Construction Group (subcontractor of NNSA) electrician was installing a new transformer (T0057) in U325 and failed to follow the LLNL Low Voltage Outage (LVO) Permit requirements and procedures.

The electrician had an LVO Permit to perform LOTO on circuit #4 Panel 1875A1-9, but he noticed he needed to replace the conductor inside of panel 1875A1-9. The electrician proceeded to perform LOTO on circuit #9 on Panel 1875A1 located upstream without following the LVO Permit process. De-energizing circuit #9 resulted in loss of power to equipment in U325.

The LLNL mechanic received a number of alarm calls for equipment in U325 and he rushed to the facility and inspected the equipment for status and potential damage. No equipment was identified to be damaged at this time. The electrician had de-energized the panel and was not working on live circuits. No injuries resulted from this event.

The additional LOTO was not approved under the scheduled LVO permit. The equipment lost power and raised concerns with the property owner. Cable Links did not follow the procedures that are set in the Site Specific Safety Plan. This was determined to be a violation of LVO permit and procedures.

Cause Description:
Operating Conditions: Normal
Activity Category: Construction
Immediate Action(s): This is an NNSA managed contract through the Albuquerque Complex. The work is being performed at LLNL. The NNSA Contracting Officer Representative (COR) was notified of this concern, at which time both NNSA and LLNL representatives spoke with the Cable Links electrician and Project Manager of the concern.
The Facilities & Infrastructure Directorate (F&I) line managers were immediately notified of the event.

On Thursday October 18, 2012, at approximately 7:00 am LLNL had a safety meeting to go over what occurred and what needs to be done. LSO/LLNL requested Cable Links to make sure that all employees are familiarized with the site specific safety plan and that they understand if there is an unsafe condition that the responsible individual needs to be contacted right away to prevent potential harm to workers. LSO/LLNL followed up with an email indicating that work should be halted and that formal notification would be forthcoming.

On Monday October 22, 2012, the Contracting Officer (CO) at the Albuquerque Complex issued the Suspension of Work for a period of seven days. As a result of the safety violation, Cable Links is requested to provide a Mitigation Plan by October 24, 2012 that addresses what steps will take to ensure that no future safety violations will occur for the remainder of the project.

**FM Evaluation:**

**DOE Facility Representative Input:**

**DOE Program Manager Input:**

Further Evaluation is Required: No

Division or Project: NNSA/LSO

Plant Area: Site 200

System/Building/Equipment: U325

**Facility Function:** Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)

**Corrective Action:**

**Lessons(s) Learned:**

**HQ Keywords:**

01E--Inadequate Conduct of Operations - Operations Procedure Noncompliance

01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical)

07C--Electrical Systems - Power Outage

08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance

11G--Other - Subcontractor

12I--EH Categories - Lockout/Tagout (Electrical or Mechanical)

14E--Quality Assurance - Work Process Deficiency

14G--Quality Assurance - Procurement Deficiency

**HQ Summary:** On October 17, 2012, an NNSA subcontractor performed a lockout/tagout
(LOTO) on a circuit that was not included on the LLNL Low Voltage Outage (LVO) Permit while installing a new transformer (T0057) in U325. De-energizing the additional circuit resulted in a loss of power to equipment in U325 and caused a number of alarms. No equipment was damaged. The electrician had de-energized the panel and was not working on energized circuits. No injuries resulted from this event.

**Similar OR Report Number:**

**Facility Manager:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Stephan Loo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>(925) 423-1369</td>
</tr>
<tr>
<td>Title</td>
<td>Doe NNSA Federal Project Director</td>
</tr>
</tbody>
</table>

**Originator:**

<table>
<thead>
<tr>
<th>Name</th>
<th>HARTNETT, ADRIENNE M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>(925) 424-6963</td>
</tr>
<tr>
<td>Title</td>
<td>PROGRAM ANALYST</td>
</tr>
</tbody>
</table>

**HQ OC Notification:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Person Notified</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

**Other Notifications:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Person Notified</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/18/2012</td>
<td>12:30 (PTZ)</td>
<td>Mike Brown</td>
<td>LSO</td>
</tr>
<tr>
<td>10/18/2012</td>
<td>12:30 (PTZ)</td>
<td>Phil Hill</td>
<td>LSO</td>
</tr>
</tbody>
</table>

**Authorized Classifier(AC):**

<table>
<thead>
<tr>
<th>Name</th>
<th>Lois Marik</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>10/23/2012</td>
</tr>
</tbody>
</table>

8) **Report Number:** NA--SS-SNL-NMFAC-2012-0007 After 2003 Redesign

**Secretarial Office:** National Nuclear Security Administration

**Lab/Site/Org:** Sandia National Laboratories - SS

**Facility Name:** SNL NM Site-wide F & M

**Subject/Title:** Mechanical subcontractor creates a short circuit during renovation at Building 804

**Date/Time Discovered:** 10/18/2012 09:30 (MTZ)

**Date/Time Categorized:** 10/18/2012 14:00 (MTZ)

**Report Type:** Notification

**Report Dates:**

<table>
<thead>
<tr>
<th>Notification</th>
<th>10/22/2012</th>
<th>15:50 (ETZ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Update</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latest Update</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Significance Category:** 3

**Reporting Criteria:** 2E(2) - Any unexpected discovery of an uncontrolled electrical hazardous energy source (e.g., live electrical power circuit, etc.). This criterion does not include discoveries made by zero-energy checks and other
precautionary investigations made before work is authorized to begin.

**Cause Codes:**

**ISM:**
- 2) Analyze the Hazards
- 3) Develop and Implement Hazard Controls
- 4) Perform Work Within Controls

**Subcontractor Involved:** Yes
National Heating and Ventilating

**Occurrence Description:** At approximately 0900, a subcontract mechanical worker was removing parts on a HVAC unit and an electrical short circuit occurred from a 120 volt light switch at Building 804. The Prime contractor had removed electrical power to the work area with the exception of the lighting circuit.

The short was caused by the mechanical subcontractor removing the energized electrical power to the HVAC unit which caused a short to the conductors. The subcontract mechanical worker was wearing a hard hat, safety glasses, safety shoes and work gloves while dismantling the heating, ventilating, and air-conditioning (HVAC) system. The tool that the mechanical subcontractor was utilizing had a rubber handle.

The worker was taken to medical for a precaution and released to full duty. There was no evidence of a shock during the event.

FMOC has categorized the event as an occurrence. It is a Group 2, Subgroup E-Hazardous energy Control (2), any unexpected discovery of an uncontrolled electrical hazardous energy source (e.g., live electrical power circuit, etc.). Significance category 3.

The severity score for the event is a 20 as follows: The electrical hazard factor--10; Environmental factor--0; Shock proximity factor--1; Arc Flash proximity factor--0; Thermal proximity factor--N/A; Injury factor--1.

**Cause Description:** Critique/Fact Finding Performed: 10/18/2012

**Operating Conditions:** Normal

**Activity Category:** Construction

**Immediate Action(s):** Worker was taken to Medical as a precaution.
Area was barricaded.
General notifications were conducted.
Investigation was initiated.

**FM Evaluation:** EOC #27195

**DOE Facility Representative Input:**

**DOE Program Manager Input:**

**Further Evaluation is Required:** Yes.
Before Further Operation? No
On October 18, 2012, an electrical short circuit occurred from a 120-volt light switch at Building 804 when a mechanical subcontractor removed parts on a heating, ventilation and cooling (HVAC) unit. The prime contractor removed electrical power to the work area with the exception of the lighting circuit. The short occurred when the subcontractor removed energized electrical power to the HVAC unit, which caused a short to the conductors. The worker was taken to medical and released to full duty. There was no evidence of a shock during the event. The electrical severity score for the event is 20.

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Person Notified</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/18/2012</td>
<td>10:00 (MTZ)</td>
<td>Anthony Chavez</td>
<td>4843</td>
</tr>
<tr>
<td>10/18/2012</td>
<td>10:00 (MTZ)</td>
<td>Stan Harrison</td>
<td>4870</td>
</tr>
</tbody>
</table>

**HQ Keywords:**
- 01M--Inadequate Conduct of Operations - Inadequate Job Planning (Electrical)
- 07D--Electrical Systems - Electrical Wiring
- 08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical)
- 11G--Other - Subcontractor
- 12C--EH Categories - Electrical Safety
- 14E--Quality Assurance - Work Process Deficiency
- 14G--Quality Assurance - Procurement Deficiency

**HQ Summary:**
On October 18, 2012, an electrical short circuit occurred from a 120-volt light switch at Building 804 when a mechanical subcontractor removed parts on a heating, ventilation and cooling (HVAC) unit. The prime contractor removed electrical power to the work area with the exception of the lighting circuit. The short occurred when the subcontractor removed energized electrical power to the HVAC unit, which caused a short to the conductors. The worker was taken to medical and released to full duty. There was no evidence of a shock during the event. The electrical severity score for the event is 20.
10/18/2012 10:00 (MTZ) Lynne Schluter 4820
10/18/2012 10:00 (MTZ) Art Ratzel 4800
10/18/2012 10:00 (MTZ) EOC 4236
10/18/2012 10:00 (MTZ) Debbie Garcia-Sanchez SSO

Authorized Classifier(AC): John Norwalk Date: 10/22/2012

Secretarial Office: National Nuclear Security Administration
Lab/Site/Org: Y12 National Security Complex
Facility Name: Y12 Nuclear Operations
Subject/Title: NDA Measurements on 9212 E-Wing furnaces
Date/Time Discovered: 10/04/2012 10:30 (ETZ)
Date/Time Categorized: 10/04/2012 18:41 (ETZ)
Report Type: Update

Report Dates:
<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/09/2012 20:06 (ETZ)</td>
<td>Notification</td>
</tr>
<tr>
<td>10/18/2012 16:16 (ETZ)</td>
<td>Initial Update</td>
</tr>
<tr>
<td>11/15/2012 15:24 (ETZ)</td>
<td>Latest Update</td>
</tr>
<tr>
<td></td>
<td>Final</td>
</tr>
</tbody>
</table>

Significance Category: 3

Reporting Criteria:
2E(2) - Any unexpected discovery of an uncontrolled electrical hazardous energy source (e.g., live electrical power circuit, etc.). This criterion does not include discoveries made by zero-energy checks and other precautionary investigations made before work is authorized to begin.

10(2) - An event, condition, or series of events that does not meet any of the other reporting criteria, but is determined by the Facility Manager or line management to be of safety significance or of concern for that facility or other facilities or activities in the DOE complex.

The significance category assigned to the management concern should be based on an evaluation of the potential risks and impact on safe operations.

(1 of 4 criteria - This is a SC 3 occurrence)

Cause Codes:
ISM: 2) Analyze the Hazards
3) Develop and Implement Hazard Controls
4) Perform Work Within Controls

Subcontractor Involved: No

Occurrence Description: Prescribed processes for control of hazardous energy were not in place while Non-Destructive Assay (NDA) staff conducted holdup measurements of a casting furnace. Measurement is performed by inserting
a probe into the furnace which comes into close proximity to a bus-bar and an induction coil. The furnace coil and bus-bar were not energized during these NDA activities; however, LOTO was not applied to the furnace prior to work start. While NDA work was in process, a Maintenance Electrician and a Production Operator came to perform scheduled post-maintenance activities on the furnace and communicated to NDA personnel that the furnace coils needed to be energized for post-maintenance purposes. The Operator and Electrician planned to raise the furnace to the up position prior to energizing the coils using controls located on a mezzanine above the furnace. NDA work requires that the furnace be in the lowered position and powered off, so NDA personnel backed away from furnace area until the Operator returned furnace to the lowered position. Furnace induction coils were never energized by the Electrician during this evolution. Once the furnace was returned to the lowered position and confirmed to be powered off (meeting condition for how NDA performed measurement in the past), NDA personnel proceeded to complete holdup measurements. NDA personnel had performed this task in a similar manner for approximately eight years.

Management concerns were noted relative to work planning and control, hazard recognition, and staff knowledge of LOTO requirements. NDA personnel did not properly notify the Shift Manager of their intent to start work and did not formally suspend work when an unexpected situation was encountered. A procedure and Automated Job Hazard Analysis (AJHA) were in place for this job; neither identified the need for LOTO controls nor specified that the furnace must be verified to be powered off prior to NDA measurements. NDA staff were not currently trained on LOTO and did not recognize the need for special hazardous energy controls.

<table>
<thead>
<tr>
<th>Cause Description:</th>
<th>Normal - NDA Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Conditions:</td>
<td>Inspection/Monitoring</td>
</tr>
<tr>
<td>Activity Category:</td>
<td>1. Work was suspended in affected area.</td>
</tr>
<tr>
<td>Immediate Action(s):</td>
<td>2. Proper notifications were made to NDA chain of command and 9212 Production Facilities Department.</td>
</tr>
<tr>
<td>FM Evaluation:</td>
<td>3. Initial meeting was held with involved parties to discuss situation and arrange further actions (Work Team Investigation)</td>
</tr>
<tr>
<td>DOE Facility Representative Input:</td>
<td>Update 10-17-2012: As a result of further investigation and analysis, including a Critique Summary Discussion, management determined it was appropriate to change the reporting criteria from 10-3 to 10-2 and 2E-2.</td>
</tr>
<tr>
<td></td>
<td>Update 11-15-2012: Please extend the due date to 12-06-2012 to allow for additional corrective action coordination between working groups.</td>
</tr>
</tbody>
</table>
Attachment 2

**DOE Program Manager**

**Input:**

**Further Evaluation is Required:** Yes.

Before Further Operation? No

By Whom: Steve C. Lambson

By When:

**Division or Project:** Production Support

**Plant Area:** Protected

**System/Building/Equipment:** 9212/9215

**Facility Function:** Uranium Conversion/Processing and Handling

**Corrective Action:**

Lessons(s) Learned:

**HQ Keywords:**

08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical)

12B--EH Categories - Conduct of Operations

14E--Quality Assurance - Work Process Deficiency

**HQ Summary:**

On October 4, 2012, concerns were raised as to whether hazardous energy controls had been implemented or if Non-Destructive Analysis (NDA) personnel were exposed to hazardous energy when they took measurements of the east side casting furnaces in E-Wing. Measurements are required for routine Nuclear Material Controls & Accountability inventory. NDA personnel were taking measurements when a maintenance electrician and a production operator told them that the furnaces needed to be energized for post-maintenance purposes. Concerns about hazardous energy control were raised and work was suspended in affected area.

**Similar OR Report Number:**

**Facility Manager:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Steve C Lamson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>(865) 576-4397</td>
</tr>
<tr>
<td>Title</td>
<td>Manager, Process and Product Engineering</td>
</tr>
</tbody>
</table>

**Originator:**

<table>
<thead>
<tr>
<th>Name</th>
<th>BURDITT, CAROL A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>(865) 576-3128</td>
</tr>
<tr>
<td>Title</td>
<td></td>
</tr>
</tbody>
</table>

**HQ OC Notification:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Person Notified</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

**Other Notifications:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Person Notified</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/04/2012</td>
<td>18:41 (ETZ)</td>
<td>Cory Hudson</td>
<td>NDA Mgr</td>
</tr>
<tr>
<td>10/04/2012</td>
<td>18:41 (ETZ)</td>
<td>Steve C Lambson</td>
<td>P&amp;P Engr</td>
</tr>
<tr>
<td>10/04/2012</td>
<td>18:41 (ETZ)</td>
<td>Ken D Keith, Jr</td>
<td>VP Engr</td>
</tr>
</tbody>
</table>
On October 22, 2012 at approximately 1500 hours, on the Idaho National Laboratory (INL) in the Research and Education Campus (REC) facility management personnel at the Willow Creek Building discovered a subcontract vendor performing equipment maintenance without the installation of a lock and tag. The vendor, who was performing routine maintenance on a commercial electric coffee-maker, had opened an internal circuit breaker to de-energize the coffee machine, but had not locked the breaker, and the equipment remained plugged in to an overhead 110-volt receptacle during the maintenance activity.

No personnel injuries were sustained as a result of this incident. No workers were exposed to hazardous energy as the equipment was de-energized while work was being performed.
Background information

The subcontractor at the WCB lobby contacted their coffee machine repair person to repair the coffee machine because the machine had failed. The repair person came to the WCB and began performing maintenance on the coffee maker as instructed by the subcontractor without knowledge of the INL. The subcontractor by-passed the requirements of the contract with the INL to include facility personnel or a technical point of contact which lead to issues related to no lock out tag out, work control documents, and authorization through plan of the day. The subcontractor was not familiar with the contents of the contract which lead to these issues.

Cause Description:
Operating Conditions: Normal Operations
Activity Category: Maintenance
Immediate Action(s): Upon discovery, BEA personnel immediately stopped the work.

The coffee-making equipment was put in a safe condition.

BEA F&SS management, Procurement, and DOE-ID Field Rep were notified.

FM Evaluation:
A critique was conducted 10/23/2012 at 1300 hours.
Actions regarding this issue will be tracked in ICAMS IO 22911

DOE Facility Representative
Input:
DOE Program Manager
Input:

Further Evaluation is Required: No

Division or Project: REC Facility Services
Plant Area: WCB
System/Building/Equipment: WCB IF-616
Facility Function: Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)

Corrective Action:
Lessons(s) Learned:
HQ Keywords:
01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical)
08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance
11G--Other - Subcontractor
12I--EH Categories - Lockout/Tagout (Electrical or Mechanical)
14E--Quality Assurance - Work Process Deficiency
HQ Summary: On October 22, 2012, Research and Education Campus facility management personnel at the Willow Creek Building discovered a subcontractor performing maintenance on a commercial coffee machine without the installation of a lockout/tagout. The subcontractor opened an internal circuit breaker to de-energize the coffee machine but did not lock the breaker. Work was immediately stopped and the coffee-making equipment was put in a safe condition.

Similar OR Report Number:

Facility Manager:

<table>
<thead>
<tr>
<th>Name</th>
<th>LINDBERG, STEVEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>(208) 526-4007</td>
</tr>
<tr>
<td>Title</td>
<td>RESEARCH AND EDUCATION CAMPUS (REC)</td>
</tr>
</tbody>
</table>

Originator:

<table>
<thead>
<tr>
<th>Name</th>
<th>LINDBERG, STEVEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>(208) 526-4007</td>
</tr>
<tr>
<td>Title</td>
<td>RESEARCH AND EDUCATION CAMPUS (REC)</td>
</tr>
</tbody>
</table>

HQ OC Notification:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Person Notified</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Other Notifications:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Person Notified</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/22/2012</td>
<td>17:00 (MTZ)</td>
<td>John Martin</td>
<td>DOE-ID</td>
</tr>
</tbody>
</table>

Authorized Classifier(AC): Jeffrey Garner Date: 10/25/2012


Secretarial Office: Nuclear Energy, Science and Technology

Lab/Site/Org: Idaho National Laboratory

Facility Name: Radiological & Environmental Sciences Lab.

Subject/Title: LO/TO Violation X-ray Machine Installation at CFA-638

Date/Time Discovered: 10/29/2012 12:00 (MTZ)

Date/Time Categorized: 10/29/2012 13:00 (MTZ)

Report Type: Notification

Report Dates: Notification 10/31/2012 14:43 (ETZ)

Significance Category: 3

Reporting Criteria: 2E(2) - Any unexpected discovery of an uncontrolled electrical hazardous energy source (e.g., live electrical power circuit, etc.). This criterion does
not include discoveries made by zero-energy checks and other precautionary investigations made before work is authorized to begin.

Cause Codes:
ISM:
Subcontractor Involved: Yes
Hopewell Design
Occurrence Description: DOE Subcontracted vendor was performing work on an electrical system without proper LO/TO processes being followed. There was no contact with hazardous energy or exposure.
Cause Description:
Operating Conditions: Normal
Activity Category: Maintenance
Immediate Action(s): Work was stopped, F&SS Management and DOE were notified, and a critique was scheduled.

FM Evaluation:
DOE Facility Representative Input:
DOE Program Manager Input:
Further Evaluation is Required: Yes.
Before Further Operation? No
By Whom:
By When:
Division or Project: DOELAP Dosimetry
Plant Area: CFA-638
System/Building/Equipment: X-ray machine installation CFA 638
Facility Function: Laboratory - Analytical
Corrective Action:
Lessons(s) Learned:
HQ Keywords:
01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical)
08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance
11G--Other - Subcontractor
121--EH Categories - Lockout/Tagout (Electrical or Mechanical)
14E--Quality Assurance - Work Process Deficiency
14G--Quality Assurance - Procurement Deficiency

HQ Summary: On October 29, 2012, a subcontractor performed work on an electrical system without following lockout/tagout procedures. There was no contact with hazardous energy. Work was stopped. A critique was scheduled.

Similar OR Report Number:
**Facility Manager:**
- **Name:** WARNER, DONALD C.
- **Phone:** (208) 526-8191
- **Title:** QUALITY ASSURANCE OFFICER

**Originator:**
- **Name:** WARNER, DONALD C.
- **Phone:** (208) 526-8191
- **Title:** QUALITY ASSURANCE OFFICER

**HQ OC Notification:**
- **Date/Time Person Notified Organization**
  - NA NA NA NA

**Other Notifications:**
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Person Notified</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/29/2012</td>
<td>12:20 (MTZ)</td>
<td>John Martin</td>
<td>DOE-ID</td>
</tr>
<tr>
<td>10/29/2012</td>
<td>12:20 (MTZ)</td>
<td>Scott McBride</td>
<td>BEA</td>
</tr>
</tbody>
</table>

**Authorized Classifier(AC):**
- **Jeff Gardner**
- **Date:** 10/29/2012

**12) Report Number:** [SC--BSO-LBL-OPERATIONS-2012-0012](#) (*After 2003 Redesign*)

**Secretarial Office:** Science

**Lab/Site/Org:** Lawrence Berkeley National Laboratory

**Facility Name:** Operations Division

**Subject/Title:** Live Energy Work Procedure Violation During B76 Boiler Replacement Project - No Injuries

**Date/Time Discovered:** 10/26/2012 10:15 (PTZ)

**Date/Time Categorized:** 10/26/2012 14:45 (PTZ)

**Report Type:** Notification/Final

**Report Dates:**
- **Notification**
  - Date: 10/30/2012
  - Time: 18:53 (ETZ)
- **Initial Update**
  - Date: 10/30/2012
  - Time: 18:53 (ETZ)
- **Latest Update**
  - Date: 10/30/2012
  - Time: 18:53 (ETZ)
- **Final**
  - Date: 10/30/2012
  - Time: 18:53 (ETZ)

**Significance Category:** 4

**Reporting Criteria:** 2E(3) - Any failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout, hazardous energy control program).

**Cause Codes:**
- 4) Perform Work Within Controls

**ISM:**
- **Yes**
- Direct Digital Controls/JR Griffin

**Subcontractor Involved:**
- Yes

**Occurrence Description:**
At approximately 1015 hours on 10/26/2012, while making observations at the Bldg 76 Boiler Replacement project, an EHSS Construction Safety employee noticed that an open FPU (Field Processing Unit) panel in room
103. An electrician from Direct Digital Controls, Inc., a subcontractor to JR Griffin, had opened FPU-004-76 panel to install a conduit into the bottom of the panel box as part of the Project work. Although the voltage within the panel is predominantly 50 volts or less, the box does contain one pair of exposed 120 volt contacts. Although the conduit was to contain wiring for the Wet Pressure Differential Sensor, the electrician was not responsible for making connections to the panel. The electrician, who has "considerable electrical experience," and is a former LBNL employee, was not authorized to open the panel because Direct Digital Controls has not provided LBNL with documentation demonstrating the electrician's experience as required by LBNL internal policy.

There were no injuries and the electrician was wearing Personal Protective Equipment (PPE) appropriate to the hazard. The electrician completed the daily Pre-task Hazard Analysis and attended the pre-job safety orientation.

**Cause Description:**

**Operating Conditions:** Indoors, lighted, dry

**Activity Category:** Construction

**Immediate Action(s):**
- Electrical work on the project was stopped and will not resume until the cause of the incident is determined.

**FM Evaluation:**
- Although reporting the incident under ORPS criterion 2E(3), Facilities Division management is electing to conduct a more in-depth investigation into the cause of the incident.
- Direct Digital Controls will re-train all four of its assigned electricians on the following work practices prior to restarting work:
  * LBNL policy and guidelines for establishing an Electrically Safe work Condition
  * LBNL policy and guidelines and methods for obtaining an Energized Electrical Work Permit (EEWP)
  * LBNL policy, guidelines and methods for obtaining a Lock out Tag out (LOTO) Permit.

**DOE Facility Representative Input:**

**DOE Program Manager Input:**

Further Evaluation is Required: No

Division or Project: Facilities Division

Plant Area: B76

**System/Building/Equipment:** Building 76 Room 103 FPU Panel

**Facility Function:** Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)
Corrective Action:

Lessons(s) Learned: Ensure all unresolved issues are clearly communicated to the replacement project manager when control of the project was handed from one responsible party to the other due to personnel changes or temporary absence.

HQ Keywords:

HQ Summary:

On October 26, 2012, an Environment, Health, Safety and Security Construction employee noticed an open FPU (Field Processing Unit) panel in Room 103, in violation of procedures, while making observations at the Building 76 Boiler Replacement project. A subcontractor electrician opened FPU-004-76 panel to install a conduit into the bottom of the panel box as part of project work. The voltage in the panel was less than 50 volts except for one pair of exposed 120 volt contacts. The electrician was not authorized to open the panel because LBNL was not provided documentation demonstrating the electrician's experience. There were no injuries and the electrician was wearing Personal Protective Equipment appropriate to the hazard. Electrical work on the project was stopped and will not resume until the cause of the incident is determined.

Similar OR Report Number:

Facility Manager:

Originator:

HQ OC Notification:

Other Notifications:

Authorized Classifier(AC):


Secretarial Office: Science
Lab/Site/Org: Pacific Northwest National Laboratory
Facility Name: Energy Research Programs (PNNL)
Subject/Title: Failure to Follow Hazardous Energy Control Process
Date/Time Discovered: 10/29/2012 13:45 (PTZ)
Date/Time Categorized: 10/29/2012 14:50 (PTZ)
Report Type: Notification/Final
Report Dates: 
<table>
<thead>
<tr>
<th>Type</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notification</td>
<td>10/31/2012</td>
<td>15:07 (ETZ)</td>
</tr>
<tr>
<td>Initial Update</td>
<td>10/31/2012</td>
<td>15:07 (ETZ)</td>
</tr>
<tr>
<td>Latest Update</td>
<td>10/31/2012</td>
<td>15:07 (ETZ)</td>
</tr>
<tr>
<td>Final</td>
<td>10/31/2012</td>
<td>15:07 (ETZ)</td>
</tr>
</tbody>
</table>
Significance Category: 4
Reporting Criteria: 2E(3) - Any failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout, hazardous energy control program).
Cause Codes:
ISM: 4) Perform Work Within Controls
Subcontractor Involved: No
Occurrence Description: On Monday, October 29, 2012, a building electrical outage was conducted at the Battelle Inhalation Laboratory (BIL). The outage involved lockout/tagout (LOTO) of the City of Richland (COR) electrical vault and the BIL diesel generator. The keys for the COR electrical vault LOTO and diesel generator were to be controlled by placing the keys in a lock box. Upon completion of the work evolution at 1345 hours, a PNNL Electrician removed his Authorized Worker LOTO from the lock box and observed the COR electrical vault key had not been placed inside the lock box but had been left on the table next to the lock box. Failure to place the COR electrical vault key in the lock box represents a failure to follow PNNL's hazardous energy control program.
Cause Description: N/A
Operating Conditions: N/A
Activity Category: Maintenance
Immediate Action(s): Appropriate notifications were made. A critique is scheduled for Thursday, November 1, 2012.
FM Evaluation:
DOE Facility Representative Input:
DOE Program Manager Input:
Further Evaluation is Required: No
Attachment 2

**Division or Project:** Operational Systems Directorate  
**Plant Area:** RCHN Area  
**System/Building/Equipment:** BIL  
**Facility Function:** Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)  
**Corrective Action:**  
**Lessons(s) Learned:**  
**HQ Keywords:**  
01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical)  
08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance  
12I--EH Categories - Lockout/Tagout (Electrical or Mechanical)  
14E--Quality Assurance - Work Process Deficiency  
**HQ Summary:** On October 29, 2012, the key for the City of Richland (COR) electrical vault lockout/tagout (LOTO) was left on the table next to the lock box instead of being placed inside the lock box, during a building electrical outage that involved LOTO of the COR electrical vault and the Battelle Inhalation Laboratory diesel generator. Failure to place the COR electrical vault key in the lock box represents a failure to follow Pacific Northwest National Laboratory’s hazardous energy control program. Appropriate notifications were made and a critique was scheduled.

**Similar OR Report Number:**  
**Facility Manager:**  
Name: Berger, J. E.  
Phone: (509) 371-7959  
Title: Manager, Maintenance & Fabrication Services  
**Originator:**  
Name: POLLARI, ROGER A  
Phone: (509) 371-7700  
Title:  
**HQ OC Notification:**  
Date: 10/29/2012  
Time: 14:51 (PTZ)  
Person Notified: Carlson, J. L.  
Organization: PNSO  
**Other Notifications:**  
Date: 10/29/2012  
Time: 14:51 (PTZ)  
Person Notified: Carlson, J. L.  
Organization: PNSO  
**Authorized Classifier(AC):** Pollari, R. A.  
Date: 10/31/2012