



Office of Health, Safety and Security

## Monthly Analysis of Electrical Safety Occurrences



January 2013

### 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 four in December 2012 to seven in January 2013. There were two reported electrical shocks, one electrical intrusion occurrence, three reported lockout/tagout occurrences, which was an increase of two occurrences from last month. In January, workers identified electrical hazards 57 percent of the time, which is an increase in hazards identification from 25 percent in December.

### 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 two reported electrical shocks in the month of January, which is a decrease from December 2012, in which there were three reported electrical shocks. These occurrences are summarized below.

1. A tool crib attendant received a shock while plugging a portable light charging cord into a power strip. Access to the multi-outlet power strip (hard wired, wall mounted) was hard to reach so the attendant used a stool to reach over a metal cabinet to the power strip while holding the charging cord with their thumb and two fingers. Once contact was made with the electrical hazardous energy, the attendant observed a spark and reported a shock in their arm with tingling/numbness in their fingers. The attendant was evaluated by the site's occupational medical provider and released to return to work. An investigation could not

determine the cause of the shock although several deficiencies in the electrical outlet configuration and wiring in the tool crib were identified.

2. A maintenance worker received an unexpected electrical shock while operating a thermostat. Maintenance workers had finished installing a new electrical back up heater on an equipment mezzanine when they decided to verify the other two area heaters were functional. The first heater worked fine but when the maintenance worker turned up the thermostat on the second heater he felt a shock to his fingers from the lever on the thermostat. Work was immediately stopped and the worker was taken for a medical evaluation and was released. The thermostat circuit was locked out and an incident investigation initiated.

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 (2.7) shocks per month.

**Figure 1 – Three-Year Trend of Electrical Shocks**

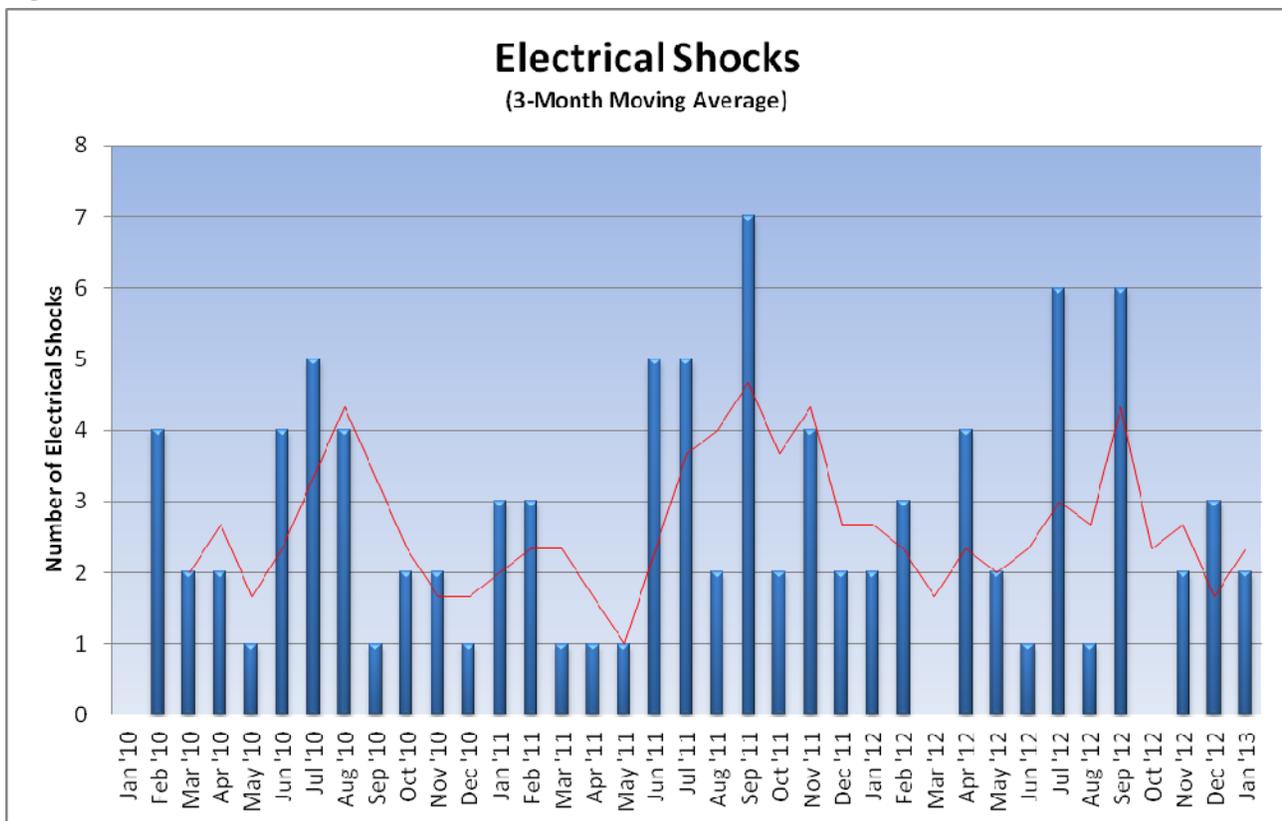


Figure 2 shows electrical shocks by worker type. The number of shocks involving electrical workers has slowly increased through 2012, while those involving non-electrical workers decreased after 2011. Since 2008, the majority of shocks (about 73 percent) involve non-electrical workers.

Figure 2 - Electrical Shock by Worker Type

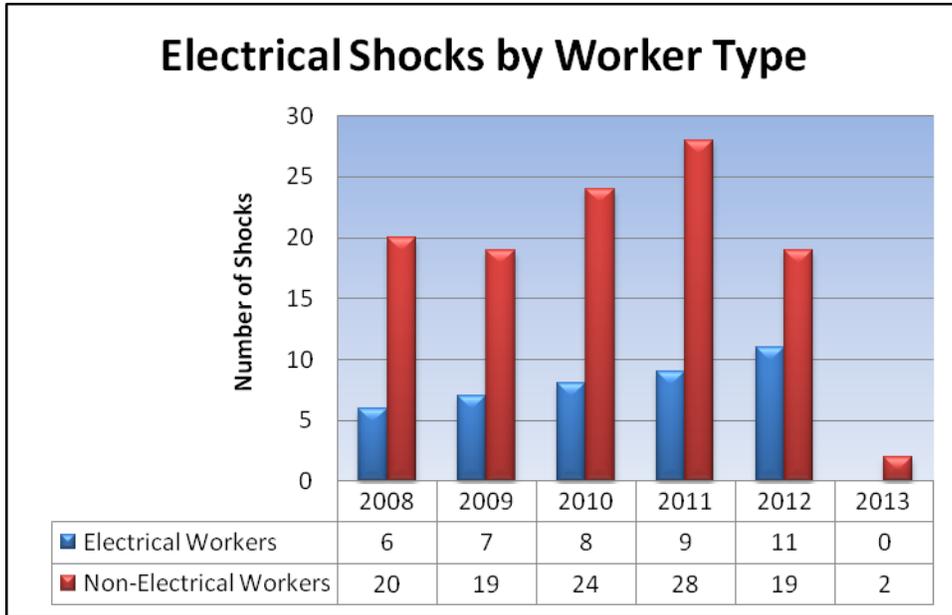
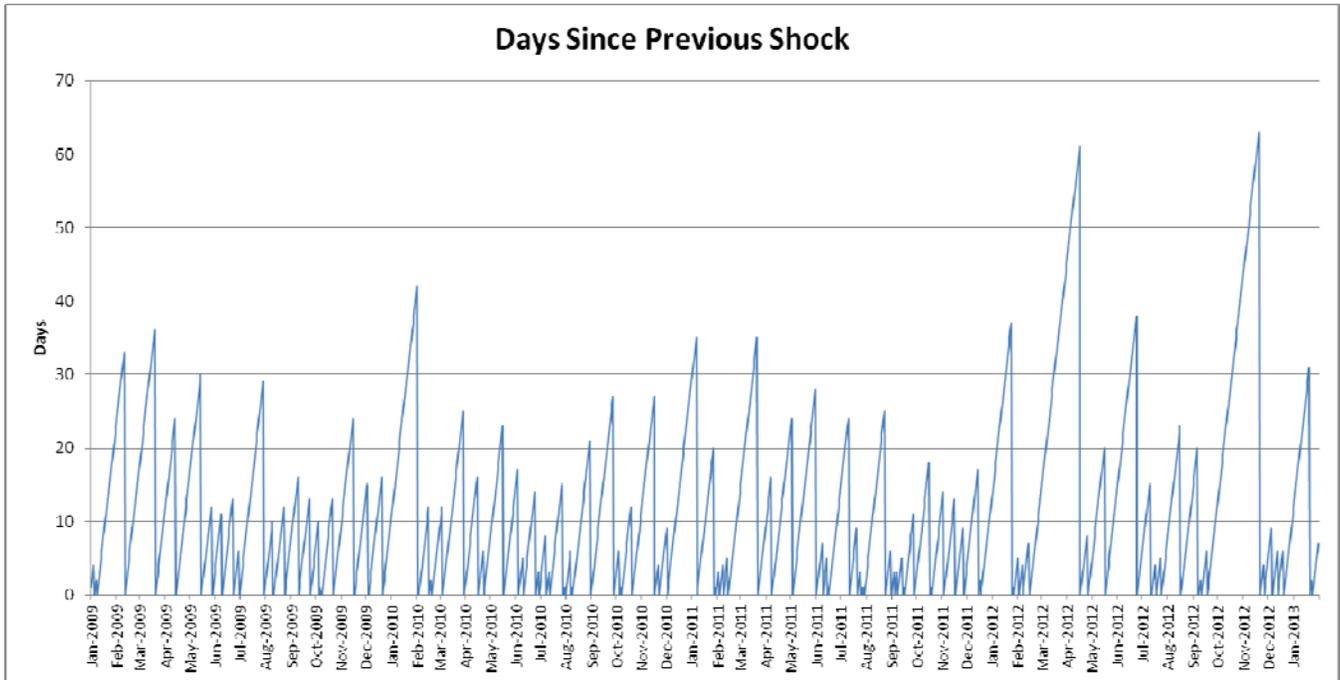


Figure 3 shows the number of days since the previous electrical shock for the DOE complex. The longest interval was 63 days (November 20, 2012) and the present interval is 7 days as of January 31.

Figure 3 - Days since Previous Shock



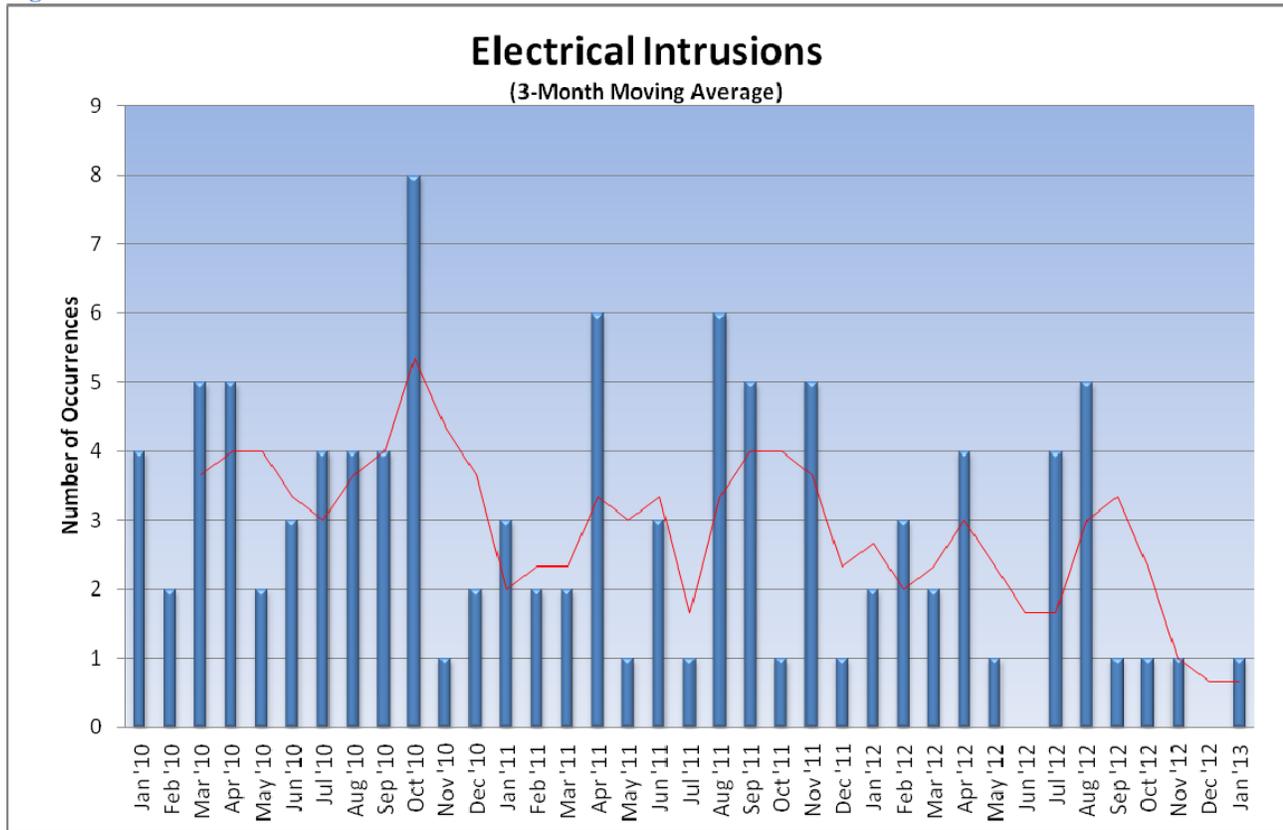
**Electrical Intrusion**

The number of electrical intrusion occurrences (i.e., cutting/penetrating, excavating, or vehicle/equipment contact of overhead electrical conductors) for January increased from none

in December to one. In this occurrence, an electrical subcontractor observed an electrical arc when a wire shorted to ground while removing a 110-volt circuit believed to be de-energized. The subcontractor was not shocked. The arc occurred during electrical demolition for an upgrade project. The subcontractor followed appropriate procedures to isolate and de-energize the circuit believed to be associated with the conduit to be removed, including a zero voltage check using a voltmeter at a receptacle and proximity tests. The subcontractor isolated the energy source with a lockout/tagout (LOTO) of an electrical panel and verified zero voltage. The original building drawings did not provide a level of detail regarding the circuits and the electricians were dependent on the panel schedules, labeling (where provided), and zero voltage checks for identification of LOTO points. Although there was evidence that an attempt to trace wiring to circuits with updated panel schedules and labeling of outlets took place in the past, it appears as though the energized wire in this event was not identifiable until the actual pulling of wires took place as part of the demolition project.

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 (2.8).

**Figure 4 – Three-Year Trend of Electrical Intrusion Occurrences**



**Hazardous Energy Control**

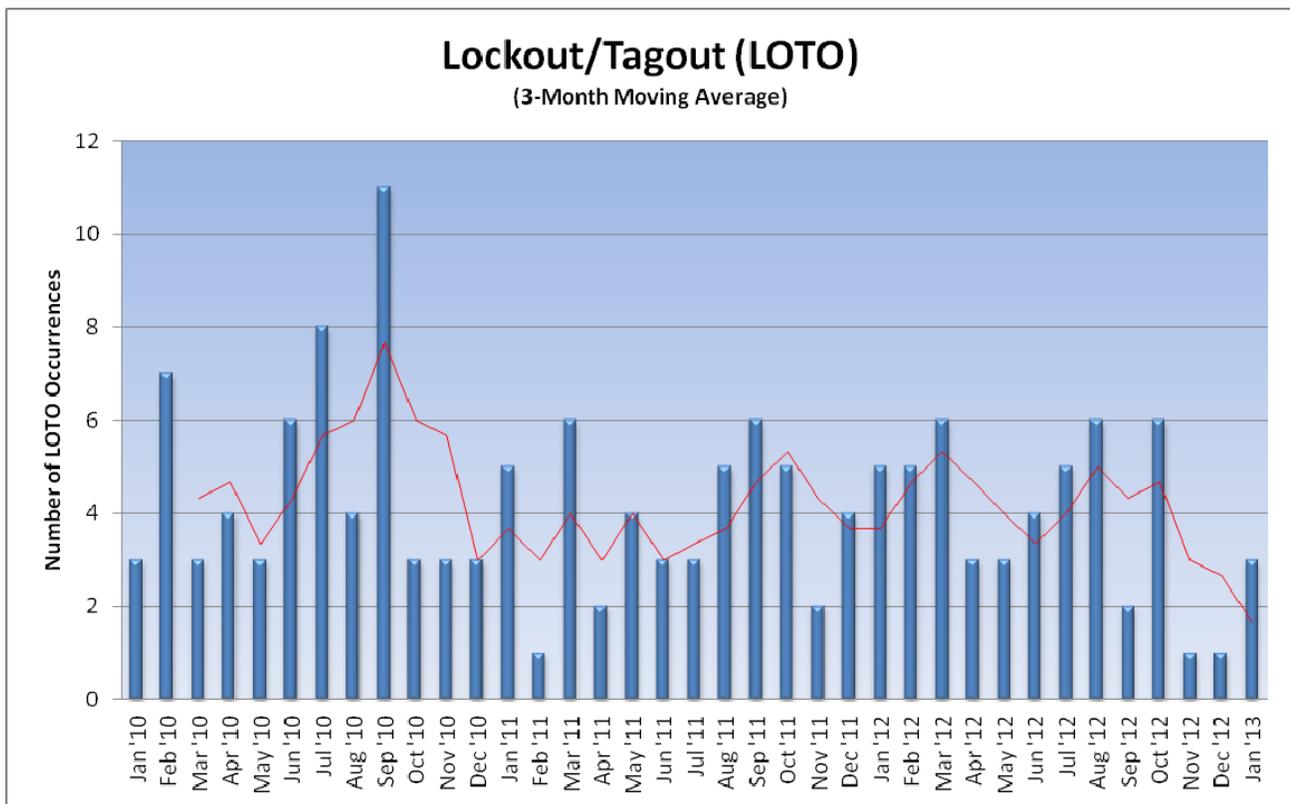
In January there were three reported occurrences involving lockout/tagout (LOTO), which is an increase from the one occurrence reported in December.

**Occurrences Involving Lockout/Tagout**

Work was being performed to replace three solenoid valves on an air drier when a pipefitter discovered that a locking device had fallen off. An electrician had verified that the breaker was in the OFF position and had installed a lockout device designed to lock the breaker in the OFF position. Three workers then installed their Authorized Worker Locks (AWL) and tags on a spider connected to the lockout device and closed the panel cover. A safe to work check was performed. The electrician lifted the leads for the solenoids, and then a pipefitter replaced the solenoid valves. When the pipefitter was finished with his portion of the task he went to the lighting panel to remove his AWL. When the pipefitter lifted the panel cover, the lockout assembly (lockout device, spider, and three AWLs and tags) fell off the circuit breaker to the floor. The circuit breaker remained in the OFF position. The pipefitter and management observer immediately exited and secured access to the building. A critique was performed.

Figure 5 shows a 3-year trend of LOTO occurrences for the DOE complex. The monthly average is 4.2 occurrences.

**Figure 5 – Three-Year Trend of Lockout/Tagout Occurrences**



Occurrences Involving Hazardous Energy Control Procedure Non-Compliances

Contractor personnel did not follow procedures when an individual did not perform a voltage test of their testing meter after verifying a zero energy condition on a 480-volt circuit. The individual did test the meter before testing the equipment. However, after verifying zero energy on the equipment, the individual did not re-test the meter before working on the verified de-energized equipment.

Discovery of Uncontrolled Hazardous Energy

The occurrence involving the discovery of uncontrolled hazardous energy is discussed in the Electrical Intrusion section.

**Electrical Near Miss**

In January, there was one occurrence that was considered to be an electrical near miss, which is an increase from no near misses in December. This occurrence was discussed in the Electrical Intrusions section.

**Monthly Occurrences Tables**

Table 1 shows a breakdown of the outcomes, performance issues, and worker types associated with the electrical safety occurrences for January 2013.

**Table 1 - Breakdown of Electrical Occurrences**

<b>Number of Occurrences (January)</b>	<b>Involving:</b>	<b>Last Month (December)</b>
2	Electrical Shocks	3
0	Electrical Burns	0
3	Hazardous Energy Control (LOTO)	1
1	Inadequate Job Planning	0
1	Inadvertent Drilling/Cutting of Electrical Conductors	0
0	Excavation of Electrical Conductors	0
0	Vehicle Intrusion of Electrical Conductors or Equipment	0
1	Electrical Near Misses	0
4	Electrical Workers	2
3	Non-Electrical Workers	2
2	Subcontractors	1

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

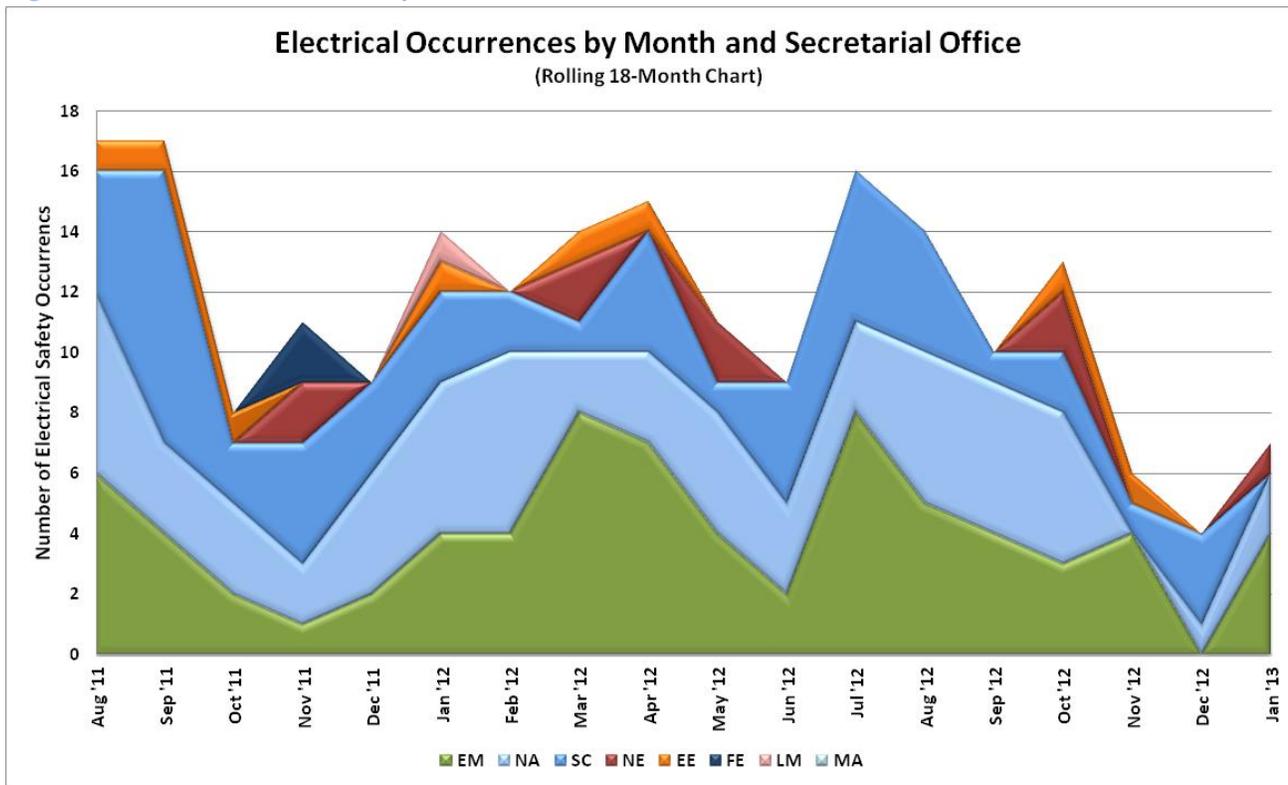
Table 2 provides a summary of the electrical safety occurrences for the previous 9 years and CY 2013. The average number of occurrences a year ago (January 2012) was 14/month.

**Table 2 - Summary of Electrical Occurrences**

Period	Electrical Safety Occurrences	Shocks	Burns	Fatalities
January	7	2	0	0
2013 total	7 (avg. 7.0/month)	2	0	0
2012 total	138 (avg. 11.5/month)	30	1	0
2011 total	136 (avg. 11.3/month)	36	5	0
2010 total	155 (avg. 12.9/month)	28	2	0
2009 total	128 (avg. 10.7/month)	25	3	0
2008 total	113 (avg. 9.4/month)	26	1	0
2007 total	140 (avg. 11.7/month)	25	2	0
2006 total	166 (avg. 13.8/month)	26	3	0
2005 total	165 (avg. 13.8/month)	39	5	0
2004 total	149 (avg. 12.4/month)	25	3	1

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

**Figure 6 - Electrical Occurrences by Month and 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.efcog.org/wg/esh\\_es/docs/Electrical\\_Severity\\_Measurement\\_Tool.pdf](http://www.efcog.org/wg/esh_es/docs/Electrical_Severity_Measurement_Tool.pdf). The six occurrences are classified as shown in Table 3. Actual scores are provided in Attachment 1.

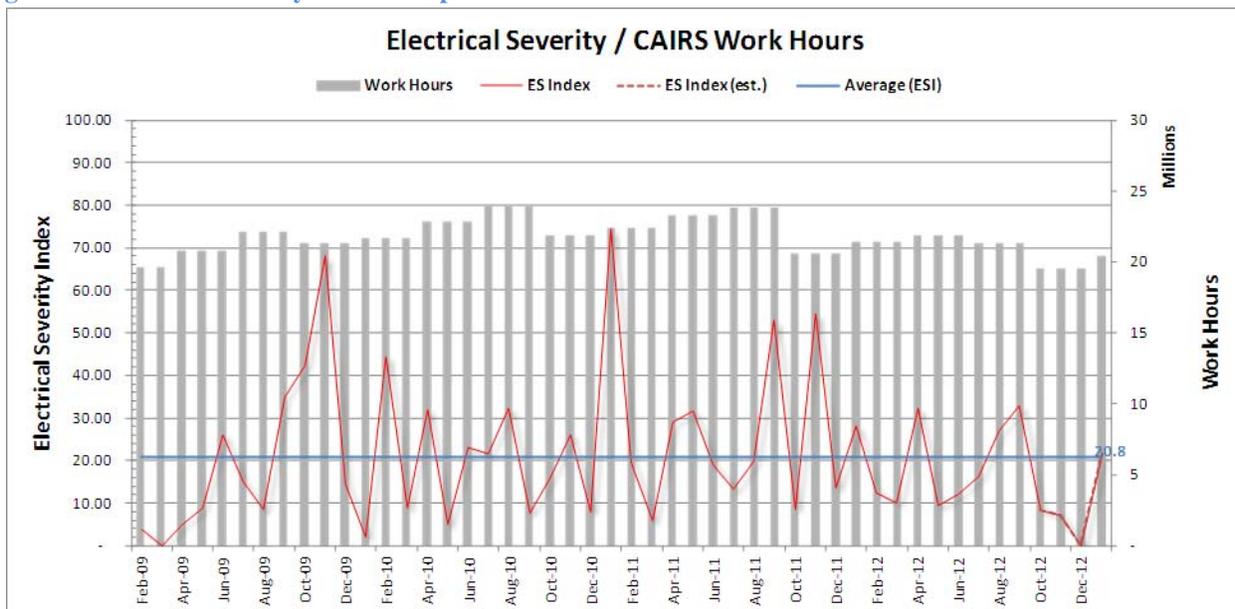
**Table 3 – Classification of Electrical Safety Occurrences by ES Score**

Occurrence Classification	Electrical Severity Score	Number of Occurrences
HIGH	≥ 1750	0
MEDIUM	31-1749	4
LOW	1-30	1
No Score	0	2

**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.

**Figure 7 - Electrical Severity Index Compared to Work Hours**



Note: An estimated ESI is calculated until accurate CAIRS man-hours are available. The chart is updated monthly.

**Table 4 - Electrical Severity Index**

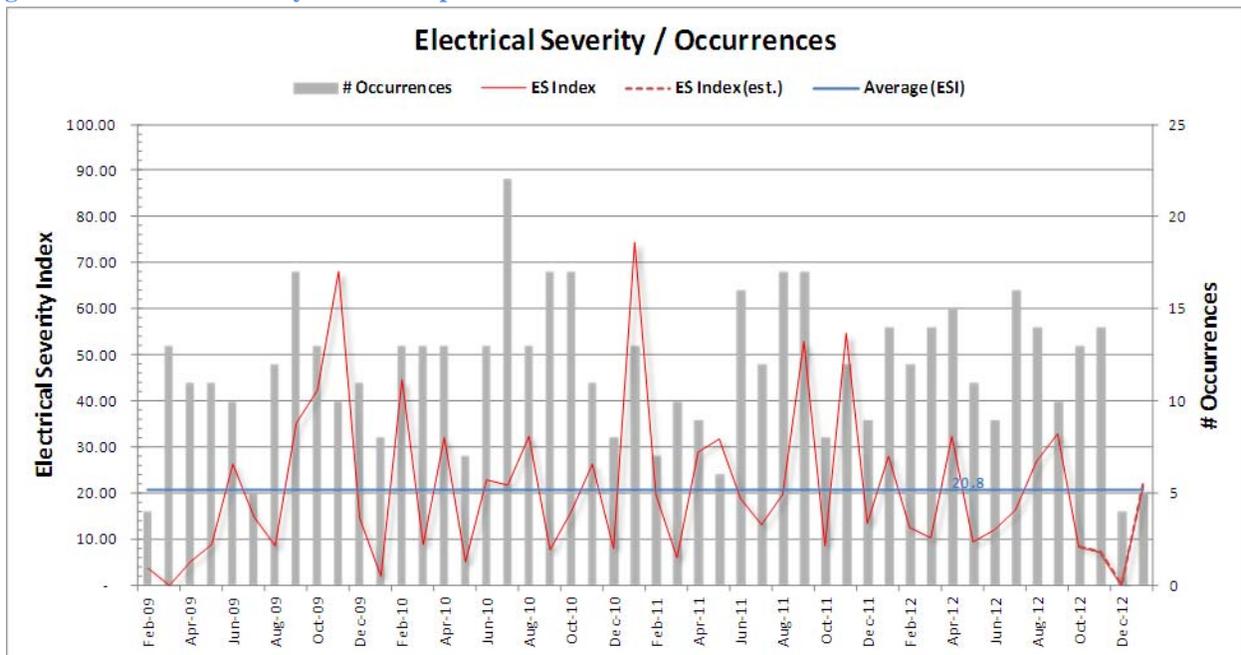
Category	December	January	Δ
<b>Total Occurrences</b>	4	7	+3
<b>Total Electrical Severity</b>	18	2,200	+2,202
<b>Estimated Work Hours</b>	19,513,539* (21,431,499)	20,397,305	+883,766
<b>ES Index</b>	0.18* (0.17)	21.77	+22.6
<b>Average ESI</b>	20.7	20.8	+0.1

\* 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 December) are shown below in parentheses.

$$\text{Electrical Severity Index} = (\sum \text{Electrical Severity} / \sum \text{Work Hours}) 200,000$$

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 (20.8) has decreased slightly for the last two months. 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 639 days as of January 31. The previous longest interval was 181 days in 2009.

Figure 9 - Days since Previous High Severity Occurrence

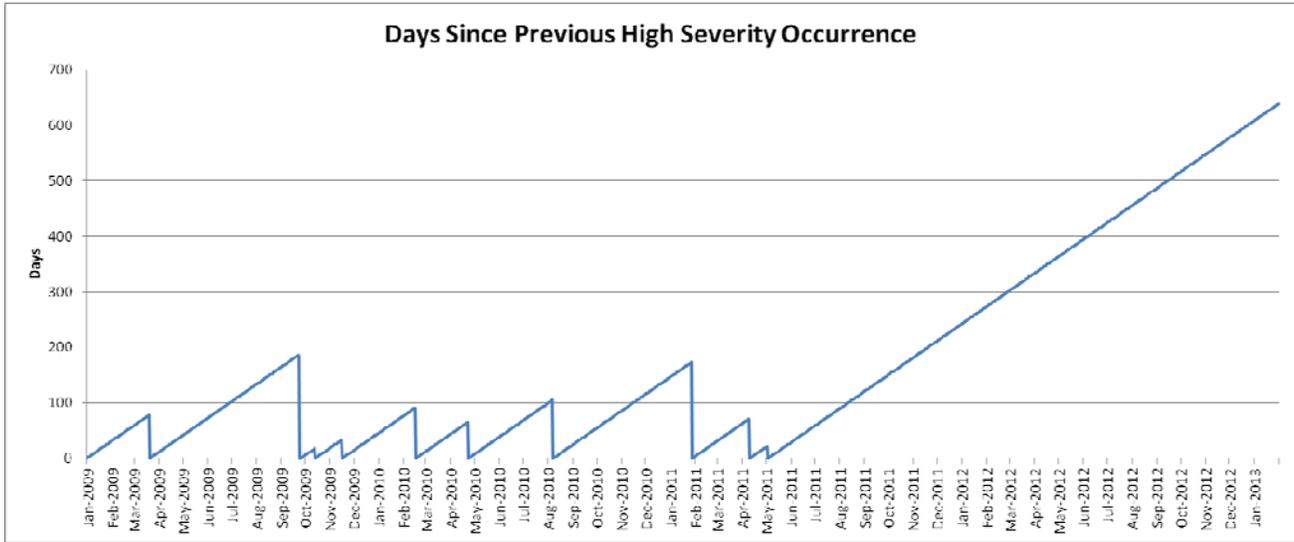
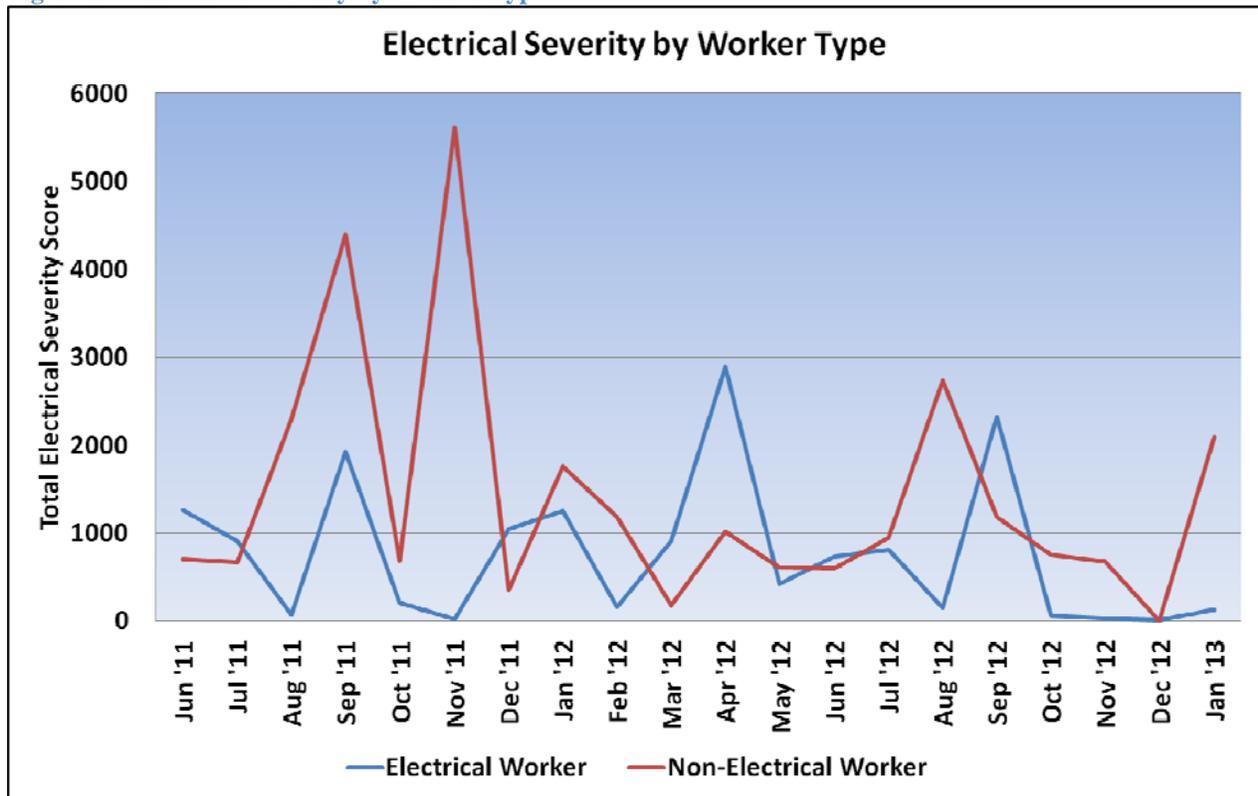


Figure 10 shows the total electrical severity score by worker type for each month.

Figure 10 – Electrical Severity by Worker Type



Electrical workers typically have the fewest number of occurrences. Following a spike of 2,320 in September 2012, the ES score for electrical workers is down to 130, while non-electrical workers ES scores have increased to 2,090. The average ES scores for the 18 month period are 1,060 for electrical workers and 1,380 for non-electrical workers.

## Summary of Occurrences by Severity Band

For the interval January 2012 through January 2013 (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)

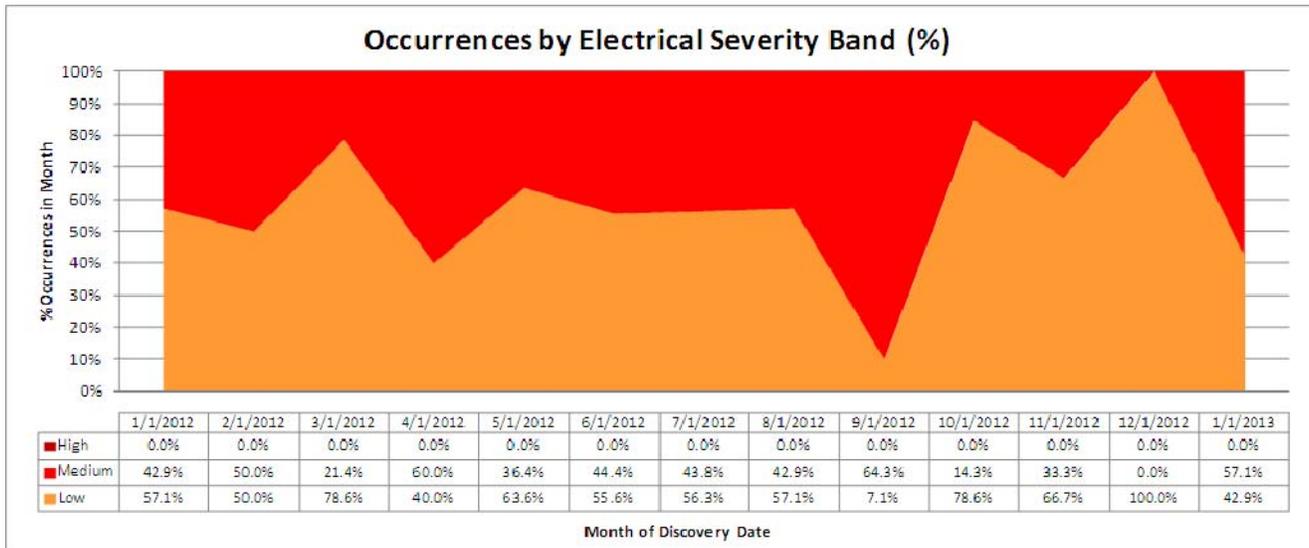
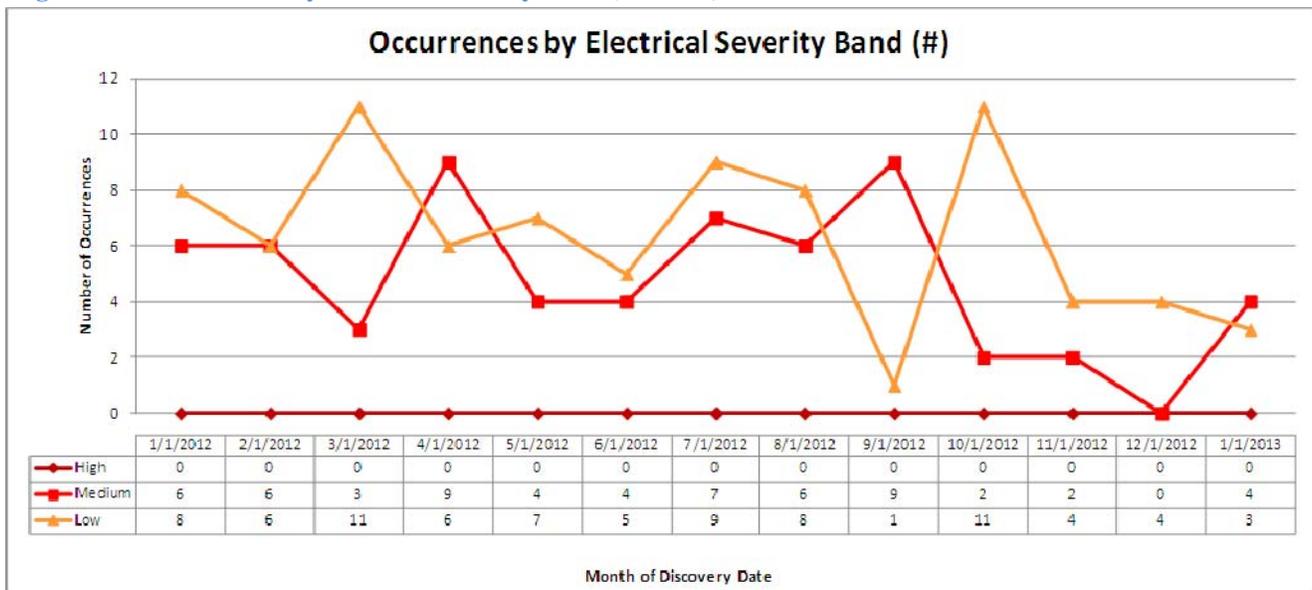


Figure 12 - Occurrences by Electrical Severity Band (Number)

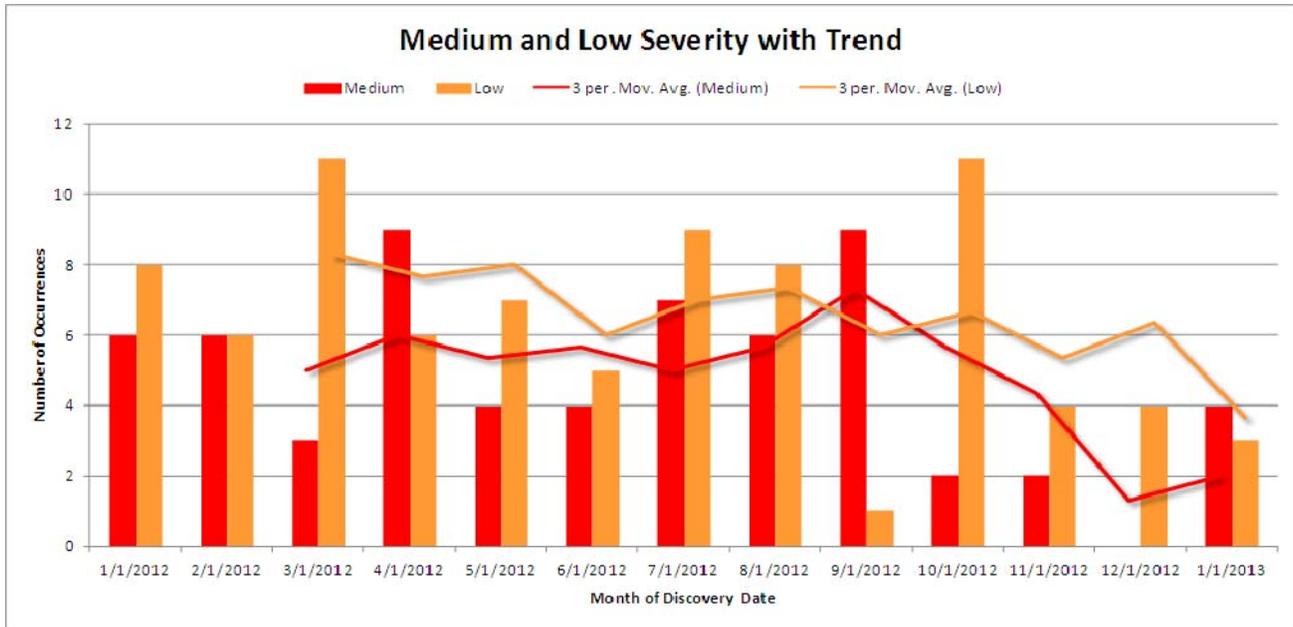


What can be seen from the previous two charts is that the number of occurrences with High electrical severity scores has remained at zero with the last event occurring back in May 2011. The number of occurrences with Medium increased while the number of Low and zero severity occurrences showed a slight decrease.

## Medium and Low Severity with Trend

Figure 13 focuses on the Medium and Low severity data series for January 2012 through January 2013. Trend lines are included for each, using a 3-month moving average.

Figure 13 - Trend of Medium and Low Electrical Severity Occurrences



The 3-month moving average shows a slight increasing trend for Medium severity occurrences as Low severity occurrences decrease. A higher percentage of Low severity occurrences is preferred.

## Additional Resources

### Electrical Safety Blog

<http://hselectricalsafety.wordpress.com/>

### Electrical Safety Wiki

<http://electricalsafety.doe-hss.wikispaces.net/home>

### EFCOG Electrical Safety Subgroup

[http://www.efcog.org/wq/esh\\_es/index.htm](http://www.efcog.org/wq/esh_es/index.htm)

### Center of Excellence for Electrical Safety

<http://www.lanl.gov/safety/electrical/>

## Contact

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Attachment 1

**Electrical Safety Occurrences – January 2013**

No	Report Number	Event Summary	SHOCK	BURN	ARCF <sup>(1)</sup>	LOTO <sup>(2)</sup>	PLAN <sup>(3)</sup>	EXCAV <sup>(4)</sup>	CUT/D <sup>(5)</sup>	VEH <sup>(6)</sup>	SC <sup>(7)</sup>	RC <sup>(8)</sup>	ES <sup>(9)</sup>
1	EM--PPPO-FBP-PORTSDD-2013-0002	A subcontractor did not perform a voltage test to the testing meter after verifying zero energy.				X					4	2E(3)	0
2	EM-RL--CPRC-WESF-2013-0001	LOTO device fell off circuit breaker handle (wrong device used).				X					4	2E(3)	110
3	EM-RP--BNRP-RPPWTP-2013-0001	Electricians failed to make required notifications before crossing RAB to perform a safe condition check.									4	2E(3)	0
4	EM-RP--WRPS-TANKFARM-2013-0001	Worker shocked while plugging a cord into a hard-wired power strip.	X								2	2E(1)	330
5	NA--KCSO-AS-KCP-2013-0001	Maintenance worker receives shock from lever on thermostat.	X								3	2E(2)	1650
6	NA--LASO-LANL-ESHSUPT-2013-0001	Workers observed an electrical spark while removing a 110V circuit as part of an upgrade project.				X			X		3	2E(2)	110
7	NE-ID--BEA-SMC-2013-0001	Inadequate drawings resulted in 120V power not isolated to an exposed relay.					X				3	2E(2)	20
	TOTAL		2	0	0	3	1	0	1	0			

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

Attachment 1

**Electrical Safety Occurrences – January 2013**

No	Report Number	Event Summary	EW <sup>(1)</sup>	N-EW <sup>(2)</sup>	SUB <sup>(3)</sup>	HFW <sup>(4)</sup>	WFH <sup>(5)</sup>	PPE <sup>(6)</sup>	70E <sup>(7)</sup>	VOLT <sup>(8)</sup>		C/I <sup>(9)</sup>	NEUT <sup>(10)</sup>	NM <sup>(11)</sup>
										H	L			
1	EM--PPPO-FBP-PORTSDD-2013-0002	A subcontractor did not perform a voltage test to the testing meter after verifying zero energy.	X		X				X		X			
2	EM-RL--CPRC-WESF-2013-0001	LOTO device fell off circuit breaker handle (wrong device used).		X		X					X			
3	EM-RP--BNRP-RPPWTP-2013-0001	Electricians failed to make required notifications before crossing RAB to perform a safe condition check.	X			X					X			
4	EM-RP--WRPS-TANKFARM-2013-0001	Worker shocked while plugging a cord into a hard-wired power strip.				<del>X</del>					X			
5	NA--KCSO-AS-KCP-2013-0001	Maintenance worker receives shock from lever on thermostat.	X			X					X			
6	NA--LASO-LANL-ESHSUPT-2013-0001	Workers observed an electrical arc while removing a 110V circuit as part of an upgrade project.	<del>X</del> X		X	X					X			X
7	NE-ID--BEA-SMC-2013-0001	Inadequate drawings resulted in 120V power not isolated to an exposed relay.	X								X			
	TOTAL		4	3	2	<del>3</del> X	4	0	1	0	7	0	0	1

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

# ORPS Operating Experience Report

## Production GUI - New ORPS

ORPS contains 56089 OR(s) with 59399 occurrences(s) as of 4/18/2013 9:17:46 AM  
 Query selected 7 OR(s) with 7 occurrences(s) as of 4/18/2013 11:00:56 AM

Download this report in Microsoft Word format. 

**1)Report Number:** [EM--PPPO-FBP-PORTSDD-2013-0002](#) **After 2003 Redesign**  
**Secretarial Office:** Environmental Management  
**Lab/Site/Org:** Portsmouth Gaseous Diffusion Plant  
**Facility Name:** Portsmouth Decontamination and Decommissioning  
**Subject/Title:** Failure To Follow a Prescribed Hazardous Energy Control Process  
**Date/Time Discovered:** 01/17/2013 16:15 (ETZ)  
**Date/Time Categorized:** 01/17/2013 17:30 (ETZ)  
**Report Type:** Notification/Final

**Report Dates:**

Notification	01/17/2013	23:48 (ETZ)
Initial Update	01/17/2013	23:48 (ETZ)
Latest Update	01/17/2013	23:48 (ETZ)
Final	01/17/2013	23:48 (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:** 4) Perform Work Within Controls  
**Subcontractor Involved:** Yes  
 SOS Construction (Electrical)

**Occurrence Description:** Contractor personnel did not follow FBP-OS-PRD-00001 Electrical Safety in that the individual did not perform a voltage test to the testing meter after verifying zero energy. The individual did test the meter before testing the equipment. After testing the equipment in question and verifying zero energy the individual did not re-test the meter prior to performing work on the verified de-energized equipment.

**Cause Description:**  
**Operating Conditions:** Normal Operations  
**Activity Category:** Construction  
**Immediate Action(s):** \* The meter was verified to be functional following completion of the work on the de-energized 480V circuit; there were no electrical shock or injuries.  
 \* PSS discussed the issue with the Problem Report author, Performance

Assurance, Site Project Management, and Shift Operations Manager.

\* A Problem Report (FBP-PR-FY13-1041) has been issued.

\* Performed notifications according to FBP-QP-PRO-00019 and LTO-IM-SO-11-009. Rev.10.

\* A Fact Finding Meeting has been scheduled.

**FM Evaluation:**

**DOE Facility Representative**

**Input:**

**DOE Program Manager**

**Input:**

**Further Evaluation is Required:** No

**Division or Project:** X-744G Power Upgrades Project

**Plant Area:** Grid Map, F-5

**System/Building/Equipment:** X-744G

**Facility Function:** Environmental Restoration Operations

**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 January 17, 2013, contractor personnel did not follow FBP-OS-PRD-00001 Electrical Safety when an individual did not perform a voltage test of their testing meter after verifying a zero energy condition on a 480-volt circuit. The individual did test the meter before testing the equipment. However, after verifying zero energy on the equipment, the individual did not re-test the meter before working on the verified de-energized equipment.

**Similar OR Report Number:**

**Facility Manager:**

Name	CARR, DENNIS
Phone	(740) 897-3532
Title	Fluor-B&W/Portsmouth Program Mgr.

**Originator:**

Name	SALYERS, GARY K
Phone	(740) 897-3025
Title	PLANT SHIFT SUPERINTENDENT

**HQ OC Notification:**

Date	Time	Person Notified	Organization
NA	NA	NA	NA

**Other Notifications:**

Date	Time	Person Notified	Organization
01/17/2013	17:30 (ETZ)	Bob Nichols	PORTSFBP
01/17/2013	18:38 (ETZ)	John Salute	DOEPORTS
01/17/2013	18:42 (ETZ)	Joel Bradburne	DOEPORTS
01/17/2013	18:46 (ETZ)	Tony Takacs	DOEPORTS
01/17/2013	19:05 (ETZ)	Fred Hughes	PORTSFBP
01/17/2013	21:00 (ETZ)	Dennis Carr	PORTSFBP

**Authorized Classifier(AC):** Gary K. Salyers      Date: 01/17/2013

**2)Report Number:** [EM-RL--CPRC-WESF-2013-0001](#) After 2003 Redesign

**Secretarial Office:** Environmental Management

**Lab/Site/Org:** Hanford Site

**Facility Name:** Waste Encapsulation & Storage Fac.

**Subject/Title:** Lockout/Tagout Device Fell Off Circuit Breaker Handle

**Date/Time Discovered:** 01/23/2013 11:22 (PTZ)

**Date/Time Categorized:** 01/24/2013 14:08 (PTZ)

**Report Type:** Notification/Final

**Report Dates:**

Notification	01/28/2013	14:00 (ETZ)
Initial Update	01/28/2013	14:00 (ETZ)
Latest Update	01/28/2013	14:00 (ETZ)
Final	01/28/2013	14:00 (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:** 3) Develop and Implement Hazard Controls

**Subcontractor Involved:** No

**Occurrence Description:** At WESF on 1/23/2013, work was to be performed to replace three solenoid valves on an air drier. The AWL lockout point was circuit breaker 11 of 225BC-LP-B in the 225BF air dryer building. The electrician verified that the breaker was in the OFF position and installed a lockout device designed to lock the breaker in the OFF position. Three workers installed their Authorized Worker Locks (AWL) and tags on a spider connected to the lockout device and closed the panel cover. A Safe to Work Check was performed. The electrician lifted the leads for

the solenoids, and then the pipefitter removed the existing solenoid valves and installed the replacement solenoid valves. The pipefitter was finished with his portion of the task, so he went to the lighting panel to remove his AWL. When the pipefitter lifted the panel cover, the lockout assembly (lockout device, spider, and three Authorized Worker Locks and tags) fell off the circuit breaker to the floor. The circuit breaker remained in the OFF position.

The event was originally evaluated and a determination made that it was not a reportable event. After the critique, it was determined that positive control (i.e., no device in place on the breaker) was not maintained therefore it could have resulted in hazardous energy being present. Due to the electrician's work not being completed and no positive control in place, the event with the additional information was reevaluated and determined that it met the criteria for a reportable event.

**Cause Description:**

**Operating Conditions:** Maintenance

**Activity Category:** Maintenance

**Immediate Action(s):** The pipefitter and management observer immediately exited and secured access to the building. The observer guarded the door to prevent anyone from entering the building, and the pipefitter notified the Shift Operations Manager of the condition. The SOM disabled the OMNI-Lock for the building and posted a sign stating No Entry Unless Authorized. A critique was performed.

**FM Evaluation:**

**DOE Facility Representative**

**Input:**

**DOE Program Manager**

**Input:**

**Further Evaluation is Required:** No

**Division or Project:** Decommissioning, Waste, Fuels, & Remediation Service

**Plant Area:** 200 East

**System/Building/Equipment:** 225BF/Compressed Air Dryer

**Facility Function:** Nuclear Waste Operations/Disposal

**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 January 23, 2013, at the Waste Encapsulation Storage Facility, work

was being performed to replace three solenoid valves on an air drier when it was discovered that a locking device had fallen off. The Authorized Worker Locks (AWL) lockout point was circuit breaker 11 of 225BC-LP-B in the 225BF air dryer building. The electrician verified that the breaker was in the OFF position and installed a lockout device designed to lock the breaker in the OFF position. Three workers installed their AWL and tags on a spider connected to the lockout device and closed the panel cover. A safe to work check was performed. The electrician lifted the leads for the solenoids, and then the pipefitter removed the existing solenoid valves and installed the replacement solenoid valves. When the pipefitter was finished with his portion of the task he went to the lighting panel to remove his AWL. When the pipefitter lifted the panel cover, the lockout assembly (lockout device, spider, and three Authorized Worker Locks and tags) fell off the circuit breaker to the floor. The circuit breaker remained in the OFF position. The pipefitter and management observer immediately exited and secured access to the building. A critique was performed.

**Similar OR Report Number:**

**Facility Manager:**

Name	Saueressig, Paul
Phone	(509) 372-0071
Title	Facility Manager

**Originator:**

Name	MILLWARD, GREG E
Phone	(509) 373-0784
Title	SENIOR ENGINEER

**HQ OC Notification:**

Date	Time	Person Notified	Organization
NA	NA	NA	NA

**Other Notifications:**

Date	Time	Person Notified	Organization
01/23/2013	11:40 (PTZ)	Paul Saueressig	WESF
01/23/2013	11:40 (PTZ)	Larry Earley	DOE RL
01/24/2013	15:45 (PTZ)	Sam Baker	MSA ONC

**Authorized Classifier(AC):**

**3)Report Number:** [EM-RP--BNRP-RPPWTP-2013-0001](#) After 2003 Redesign  
**Secretarial Office:** Environmental Management  
**Lab/Site/Org:** Hanford Site  
**Facility Name:** RPP Waste Treatment Plant  
**Subject/Title:** Hazardous Energy Work performed without Procedural Compliance  
**Date/Time Discovered:** 01/09/2013 16:00 (PTZ)  
**Date/Time Categorized:** 01/09/2013 16:20 (PTZ)

**Report Type:** Notification/Final

<b>Report Dates:</b>	Notification	01/14/2013	15:39 (ETZ)
	Initial Update	01/14/2013	15:39 (ETZ)
	Latest Update	01/14/2013	15:39 (ETZ)
	Final	01/14/2013	15:39 (ETZ)
	Revision 1	02/18/2013	17:47 (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:** A3B1C03 - Human Performance Less Than Adequate (LTA); Skill Based Errors; Incorrect performance due to mental lapse  
 -->couplet - A4B1C01 - Management Problem; Management Methods Less Than Adequate (LTA); Management policy guidance / expectations not well-defined, understood or enforced

**ISM:** 4) Perform Work Within Controls

**Subcontractor Involved:** No

**Occurrence Description:** On 1-09-2013, in the T-14A building, a crew of electricians failed to notify Safety Assurance, Site Medical Staff or Emergency Services Personnel prior to crossing a Restricted Approach Boundary to perform a Safe Condition Check. This is in violation with project requirements for Hazardous Energy Work.

Additional information:  
 At no time, during the event, were the electricians exposed to hazardous energy.  
 Safety Assurance personnel and medical staff were on site but were not made aware of personnel crossing the Restricted Approach Boundary.

**Cause Description:** A3B1C03 – Incorrect performance due to mental lapse.  
 Rationale – The worker knew the appropriate actions to take but failed to initiate the correct actions based on over-attention.

A4B1C01 – Management policy expectations not enforced.  
 Rationale – Personnel exhibited a lack of understand of existing policy and expectations. Therefore the requirement could not be enforced.

**Operating Conditions:** Under Construction

**Activity Category:** Construction

**Immediate Action(s):** A work pause to Lockout Tagout's Management Suspension of Work was implemented immediately to revise the actions required to resume all Lockout Tagout work. No new Lockout Tagout work will be conducted that is not already in place pending revision to the partial release criteria.

**FM Evaluation:** This event is being tracked in the project issues evaluation reporting (PIER) system. Any activity regarding this event will be identified in 24590-WTP-PIER-MGT-13-0020.

**DOE Facility Representative**

**Input:**

**DOE Program Manager**

**Input:**

**Further Evaluation is Required:** No

**Division or Project:** Waste Treatment Project

**Plant Area:** 600

**System/Building/Equipment:** T-14A

**Facility Function:** Nuclear Waste Operations/Disposal

**Corrective Action 01:**

<b>Target Completion Date:</b> 02/18/2013	<b>Tracking ID:</b> 24590-WTP-PIER-MGT-13-0020
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Evaluate and determine if disciplinary action is warranted.

**Corrective Action 02:**

<b>Target Completion Date:</b> 03/18/2013	<b>Tracking ID:</b> 24590-WTP-PIER-MGT-13-0020
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Coordinate team review to check that action descriptions have addressed the issues (causes), actions taken adequately answer action descriptions, objective evidence is provided for verifications, and any applicable ORPS reports are issued and match.

**Corrective Action 03:**

<b>Target Completion Date:</b> 03/14/2013	<b>Tracking ID:</b> 24590-WTP-PIER-MGT-13-0020
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Occurrence report coordinator to ensure that corrective actions in the final occurrence report match the corresponding actions in the respective PIER.

**Lessons(s) Learned:** N/A

**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 January 9, 2013, a crew of electricians in Building T-14A failed to notify Safety Assurance, Site Medical Staff or Emergency Services Personnel before they crossed a Restricted Approach Boundary to perform a Safe Condition Check. This is in violation of the project requirements for Hazardous Energy Work. At no time during the event were the electricians exposed to hazardous energy.

**Similar OR Report Number:** 1. EM-RP--BNRP-RPPWTP-2012-0010

**Facility Manager:**

Name	Steve Overton
Phone	(509) 373-8268
Title	Manager of Construction

**Originator:**

Name	MEAGHER, THOMAS S.
Phone	(509) 373-8467
Title	SAFETY ASSURANCE

**HQ OC Notification:**

Date	Time	Person Notified	Organization
NA	NA	NA	NA

**Other Notifications:**

Date	Time	Person Notified	Organization
01/09/2013	16:00 (PTZ)	Paul Schroder	DOE
01/09/2013	16:00 (PTZ)	Tucker Campbell	BNI
01/09/2013	16:28 (PTZ)	Ken Davis	EOC

**Authorized Classifier(AC):**

**4)Report Number:**

[EM-RP--WRPS-TANKFARM-2013-0001](#) After 2003 Redesign

**Secretarial Office:**

Environmental Management

**Lab/Site/Org:**

Hanford Site

**Facility Name:**

Tank Farms

**Subject/Title:**

Unexpected Contact With An Electrical Hazardous Energy Source In The 272-AW Tool Crib

**Date/Time Discovered:**

01/21/2013 12:46 (PTZ)

**Date/Time Categorized:**

01/21/2013 16:23 (PTZ)

**Report Type:**

Final

**Report Dates:**

Notification	01/23/2013	17:14 (ETZ)
Initial Update	03/07/2013	15:52 (ETZ)
Latest Update	03/07/2013	15:52 (ETZ)
Final	03/21/2013	22:56 (ETZ)
Revision 1	03/22/2013	14:38 (ETZ)

**Significance Category:**

2

**Reporting Criteria:**

2E(1) - Any unexpected or unintended personal contact (burn, injury, etc.) with an electrical hazardous energy source (e.g., live electrical power circuit, etc.).

**Cause Codes:**

A7B4C01 - Other problem; No Cause is Applicable; No Cause is Applicable

**ISM:**

2) Analyze the Hazards

3) Develop and Implement Hazard Controls

**Subcontractor Involved:**

No

**Occurrence Description:**

An unexpected contact with an electrical hazardous energy source occurred when a tool crib attendant was plugging a portable light charging cord into a hard wired wall mounted multi-outlet power strip. The access to this wall mounted power strip was hard to reach, so the tool crib attendant used a stool to reach over a metal cabinet to the power strip while holding the charging cord with their thumb and two fingers. Once contact was made, the individual observed a spark and reported a shock in their arm with tingling/numbness in their fingers.

**Cause Description:**

The causes of this event were determined using Apparent Cause Analysis as defined in the ESHQ Manual, Quality Correction, TFC-ESHQ-Q\_C-C-01, "Problem Evaluation Request," utilizing Cause and Effect Analysis methodology.

The analysis team concluded that the cause for the event was indeterminate due to insufficient evidence from the investigation work package TFC-WO-13-1287, "272-AW Investigate Cause of Spark from Plug Mold," to confirm if the energy source was from the electrical system to the worker or a static discharge from the worker to the plug mold casing. (A7B4C01)

Personnel interviewed during the investigation stated Circuit #8 in Panel C appeared to be "overloaded" based on the number of items plugged into the outlets. However, a search of the Problem Evaluation Request database and a review of the past three years of East Accident Prevention Council Workplace Safety Observation Checklists (documented on Form A-6004-023) yielded no formal report of an overloaded circuit and the investigative work performed determined the amperes load and GFCI loading were within acceptable parameters.

Electrical System Discussion:

During the investigation of this event, several deficiencies in the electrical outlet configuration and wiring in the 272-AW Tool Crib were identified. These deficiencies included:

- \* The Ground Fault Circuit Interrupter (GFCI) fed from Circuit #8 in Panel C was opened and found to have improper bonding.
- \* The outlet box was not properly secured to the wall and the size of the box was inadequate for wires and GFCI receptacle to fit.
- \* The outlet box was not bonded and the GFCI was only protecting the

four outlets to the east of the box, which were also determined to be improperly bonded. The GFCI box was modified by installing an extension ring to provide ample space for the GFCI. A new GFCI was installed to protect all downstream outlets. However, due to the GFCI and the four outlets connection location to the electrical system, these deficiencies would not have caused the event.

\* The wall-mounted plug mold and three outlet receptacles connected in line with the plug mold were also investigated. The plug mold was taken apart and determined to be improperly bonded due to the orientation of the bonding connection points. Bonding was achieved, but was not optimal, which would have reduced the effectiveness in minimizing the potential between components resulting from a fault in the system; an electrical fault was not detected on the system during the investigation. Additionally, the wall-mounted plug mold was not included on the electrical schematics for the 272-AW Tool Crib.

\* The three outlets connected in line with the plug mold were investigated and no visible signs of burn marks or discoloration were evident, but all three were determined to be improperly bonded. The investigation revealed the GFCI outlet fed from Circuit #8 in Panel C did not protect the outlets feeding the plug mold. The electricians noted that only the outlet located due east was protected by the GFCI, which explains why this event did not trip the GFCI.

\* A shared common neutral was identified during the investigation, which was determined not to be a contributing factor for this event, but is no longer an accepted practice.

The deficiencies described above were remedied by the following actions:

\* The wall-mounted plug mold was removed since it was not part of the building electrical system schematics.

\* The condition of improper bonding with the three in line outlets was corrected.

\* The electricians reconfigured the charging station with re-locatable power strips to allow easier access to the outlets and accommodate the tools. Power was restored to Circuit #8 in Panel C and checks were performed to ensure all charging items came back on. As the electricians plugged in the last power strip, they observed an electrical spark and accompanying snapping noise. Circuit #8's breaker was making a popping sound and was not performing optimally. Work package TFC-WO-13-1455 was initiated to replace Circuit #8's breaker.

\* Further investigation was completed on the GFCI and amperes readings were taken on circuits #6, 8, and 10 in Panel C. An Electrical Engineer observed the GFCI test and the results were within acceptable parameters.

\* Work package TFC-WO-13-1462 was created to eliminate the shared common neutral.

Based on the evidence collected from the investigative work package, and subsequent investigation and analysis, the cause for the electrical shock at 272-AW on January 21, 2013, was indeterminate. None of the deficiencies noted above could be specifically identified as a cause of a shock.

#### Static Discharge Discussion:

The investigation also looked at a static discharge as another possible cause, especially since others experienced static discharges at different locations around the same time. Although bonding of the plug mold was not optimal, there was sufficient bonding to allow a static charge to be grounded through the system; however, the conditions could not be reproduced to confirm static discharge. The worker stated there was discomfort/pain felt, which would suggest something stronger than a static discharge from a person, but studies have shown the human body can achieve a 1 to 10 kilovolts (kV) potential with a maximum potential as high 20–25 kV under the right conditions. At 10 kV or greater, most people would consider the shock to be painful and experience involuntary recoil. Due to the contributing factors that cause static electricity; such as indoor floor covering, shoe sole materials, furniture cover materials, relative humidity, temperature variance, etc. it was not possible to replicate identical circuit load and environmental conditions to confirm this as a cause.

#### Extent of Condition

This issue was bounded to the two Tank Farm tool cribs under Washington River Protection Solutions control (i.e., 272-AW Tool Crib and the 2101-HV Tool Crib) where hard-wired wall mounted multi-plug outlets could be installed and where multiple power tools are plugged in for use or charging. All other electrical outlets in Tank Farm facilities are outside the scope of this extent of condition review.

The first tool crib located in building 272-AW had several deficiencies that could have resulted in unintentional contact with hazardous electrical energy. The second tool crib located in building 2101-HV was

inspected to determine if the same conditions exist with the hard-wired wall mounted multi-plug outlet. This tool crib did not have a wall-mount plug mold installed like the 272-AW Tool Crib. Standard outlets and GFCIs in the tool cribs were investigated and similar deficiencies were identified for correction. Deficiencies have been corrected or are scheduled for correction.

**Operating Conditions:**

Does not apply.

**Activity Category:**

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

**Immediate Action(s):**

The employee was evaluated at the Hanford Site's occupational medical provider HPM Corporation (HPMC) and released to return to work. The tool crib area was secured. Event investigation conducted. Maintenance is investigating the cause for the spark. Extent of Condition review of other WRPS tool cribs is being conducted. Notifications were made.

**FM Evaluation:**

This event only affected activities in the 272-AW Tool Crib and resulted in suspended use of the hard-wired wall mounted multi-plug outlet to power portable electrical equipment or charge batteries used by the portable equipment. An electrical engineering review was conducted resulting in the relocation of personnel and equipment who shared electrical load from Panel C, Circuit Breaker #8 with the 272-AW Tool Crib. This reduced the maximum load potential placed on Circuit Breaker #8. Based on the identified issues from the investigative work package TFC-WO-13-1287, two additional work packages have been initiated to replace Panel C, Circuit Breakers #6, 8, and 10, and to eliminate the "shared neutral" configuration to Panel C, Circuits #6, 8 and 10. Additionally, the one other tool crib under Washington River Protection Solutions control was inspected as part of the extent of condition and several electrical safety deficiencies needing correction were identified. However, the same condition of a wall-mounted plug mold was not identified.

**DOE Facility Representative** Approved

**Input:**

Entered by: FRINK, RONALD L 03/21/2013

**DOE Program Manager**

**Input:**

**Further Evaluation is Required:**

No

**Division or Project:**

Washington River Protection Solutions LLC (WRPS)

**Plant Area:**

200 East

**System/Building/Equipment:** Electrical/272-AW/Power Tool Recharging Station

**Facility Function:**

Nuclear Waste Operations/Disposal

**Corrective Action 01:**

<b>Target Completion Date:</b> 04/17/2013	<b>Tracking ID:</b> WRPS-PER-2013-0094.1
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Update Panel C Circuit #8 "neutral" wiring to eliminate the "shared" neutral configuration.

Objective Evidence: A copy of completed work package TFC-WO-13-1462. Work package status can be at "Field Work Complete" to close this action.

Actionee: Legard, James D (Dave)

**Corrective Action 02:**

<b>Target Completion Date:</b> 04/17/2013	<b>Tracking ID:</b> WRPS-PER-2013-0094.2
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Replace Circuit #6, 8 and 10 breakers in Panel C.

Objective Evidence: A copy of completed work package TFC-WO-13-1455. Work package status can be at "Field Work Complete" to close this action.

Actionee: Legard, James D (Dave)

**Corrective Action 03:**

<b>Target Completion Date:</b> 04/30/2013	<b>Tracking ID:</b> WRPS-PER-2013-0094.3
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Submit lessons learned from this event in accordance with TFC-OPS-OPER-C-28, Lessons Learned.

Objective Evidence: A copy of the issued Lessons Learned.

Actionee: Ellis, Martin W

**Lessons(s) Learned:**

Although the cause was indeterminate, the investigation revealed numerous electrical safety deficiencies and the need for more critical inspections during routine safety walkdowns and increased awareness by workers of safety deficiencies at the jobsite. Although the deficiencies were determined not to be contributing factors for this event, any one of the deficiencies could result in injury to personnel or damage to equipment if left uncorrected. Deficiencies identified that are detectable by visual inspection include (1) "Daisy Chains" involving re-locatable power strips and surge protectors, (2) plugging in high load equipment (e.g., coffee pots and refrigerators) into re-locatable power strips or surge protectors not rated for the amp load of the equipment, (3) outlet boxes not properly attached to the wall or missing cover screws, and (4) excessive number of portable tools/battery chargers plugged into the same circuit to include the perception of excessive loading, but not taking action to confirm if the condition is safe.

**HQ Keywords:**

01S--Inadequate Conduct of Operations - Incorrect/Inadequate

Installation  
 07D--Electrical Systems - Electrical Wiring  
 08A--OSHA Reportable/Industrial Hygiene - Electrical Shock  
 12C--EH Categories - Electrical Safety  
 14E--Quality Assurance - Work Process Deficiency

**HQ Summary:** On January 21, 2013, while plugging a portable light charging cord into a power strip, a tool crib attendant received a shock. Since access to the multi-outlet power strip (hard wired, wall mounted) was hard to reach, the tool crib attendant used a stool to reach over a metal cabinet to the power strip while holding the charging cord with their thumb and two fingers. Once contact was made with the electrical hazardous energy, the attendant observed a spark and reported a shock in their arm with tingling/numbness in their fingers. The employee was evaluated by the Hanford Site's occupational medical provider and released to return to work. The tool crib area was secured and an investigation was initiated.

**Similar OR Report Number:** 1. EM-RFO--KHLL-371OPS-1998-0084  
 2. SC--BHSO-BNL-BNL-2011-0030

**Facility Manager:**

Name	Ellis, Martin W
Phone	(509) 373-4696
Title	Manager, Base Ops Technical Support

**Originator:**

Name	WATERS, SHAUN F
Phone	(509) 373-3457
Title	OPERATIONS SPECIALIST

**HQ OC Notification:**

Date	Time	Person Notified	Organization
NA	NA	NA	NA

**Other Notifications:**

Date	Time	Person Notified	Organization
01/21/2013	16:27 (PTZ)	Frink, R. L.	DOE-ORP
01/21/2013	16:29 (PTZ)	Cornell, T. M.	MSA-EOC
01/21/2013	16:46 (PTZ)	Ringo, S. D.	WRPS

**Authorized Classifier(AC):**

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**5)Report Number:** [NA--KCSO-AS-KCP-2013-0001](#) After 2003 Redesign  
**Secretarial Office:** National Nuclear Security Administration  
**Lab/Site/Org:** Kansas City Plant  
**Facility Name:** Kansas City Plant  
**Subject/Title:** Maintenance Worker Receives Unexpected Shock from Thermostat  
**Date/Time Discovered:** 01/24/2013 13:30 (CTZ)  
**Date/Time Categorized:** 01/24/2013 14:00 (CTZ)

**Report Type:** Notification

<b>Report Dates:</b>	Notification	01/25/2013	11:56 (ETZ)
	Initial Update		
	Latest Update		
	Final		

**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

**Subcontractor Involved:** No

**Occurrence Description:** On January 24, 2013 at approximately 1315 hours at the Kansas City Plant (KCP) managed by Honeywell Federal Manufacturing & Technologies Kansas City (FM&T/KC) a maintenance worker received an electrical shock. Maintenance workers had finished installing a new electrical back up heater on the equipment mezzanine when they decided to verify the other two area heaters were functional. The first heater worked fine but when he turned up the thermostat on the second heater he felt a shock to his fingers from the lever on the thermostat.

**Cause Description:**

**Operating Conditions:** Does not apply.

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

**Immediate Action(s):** Work was immediately stopped and the worker was taken to Medical Care Services for evaluation. The worker was checked out and released. The circuit was locked out and verified no current at the thermostat.

**FM Evaluation:** Incident investigation initiated.

**DOE Facility Representative Input:**

**DOE Program Manager Input:**

**Further Evaluation is Required:** Yes.  
 Before Further Operation? Yes  
 By Whom: Electrical Committee  
 By When: 01/31/2013

**Division or Project:** Honeywell Federal Mfg. & Technologies Kansas City

**Plant Area:** East Building  
**System/Building/Equipment:** Thermostat  
**Facility Function:** Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)

**Corrective Action:**

**Lessons(s) Learned:**

**HQ Keywords:** 08A--OSHA Reportable/Industrial Hygiene - Electrical Shock  
 12C--EH Categories - Electrical Safety  
 14L--Quality Assurance - No QA Deficiency

**HQ Summary:** On January 24, 2013, a maintenance worker received an unexpected electrical shock while operating a thermostat. Maintenance workers had finished installing a new electrical back up heater on the equipment mezzanine when they decided to verify the other two area heaters were functional. The first heater worked fine but when the maintenance worker turned up the thermostat on the second heater he felt a shock to his fingers from the lever on the thermostat. Work was immediately stopped and the worker was taken to Medical Care Services where he was evaluated and released. The thermostat circuit was locked out and an incident investigation initiated.

**Similar OR Report Number:**

**Facility Manager:**

Name	Kevin Allgeyer
Phone	(816) 997-5107
Title	Sr. HS&E Manager

**Originator:**

Name	TAYLOR, LINDA M
Phone	(816) 997-3747
Title	ES&H COORDINATOR

**HQ OC Notification:**

Date	Time	Person Notified	Organization
NA	NA	NA	NA

**Other Notifications:**

Date	Time	Person Notified	Organization
01/24/2013	14:00 (CTZ)	J Innocent	KCFO

**Authorized Classifier(AC):** Clyde E. Hicks    Date: 01/24/2013

**6)Report Number:** [NA--LASO-LANL-ESHSUPT-2013-0001](#) After 2003 Redesign  
**Secretarial Office:** National Nuclear Security Administration  
**Lab/Site/Org:** Los Alamos National Laboratory  
**Facility Name:** Env., Safety and Health Supt.  
**Subject/Title:** Electrical Demolition Work Results in Unexpected Discovery of Uncontrolled Electrical Energy  
**Date/Time Discovered:** 01/15/2013 11:45 (MTZ)

**Date/Time Categorized:** 01/15/2013 12:00 (MTZ)

**Report Type:** Final

**Report Dates:**

Notification	01/17/2013	15:21 (ETZ)
Initial Update	02/28/2013	20:42 (ETZ)
Latest Update	02/28/2013	20:42 (ETZ)
Final	02/28/2013	20:42 (ETZ)
Revision 1	04/08/2013	13:52 (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:** A1B3C02 - Design/Engineering Problem; Design / documentation LTA; Design/documentation not up-to-date  
A5B2C04 - Communications Less Than Adequate (LTA); Written Communication Content LTA; Equipment identification LTA

**ISM:** 6) N/A (Not applicable to ISM Core Functions as determined by management review.)

**Subcontractor Involved:** Yes  
Pueblo Electric

**Occurrence Description:** MANAGEMENT SYNOPSIS  
On January 15, 2013, at 1145 hours, at Los Alamos National Laboratory, a subcontractor (E-1) with Pueblo Electric (PE) observed an electrical arc while removing a 110V circuit in the performance of work performed as part of an upgrade project at Technical Area 59, building 1 (TA59-1). E-1 was not shocked. Prior to beginning work, the PE electricians followed appropriate procedures in isolating and deenergizing the circuit believed to be associated with the conduit to be removed; including a zero voltage check using a volt meter at the receptacle. Additionally, while proceeding with the job, the PE electricians performed proximity tests to confirm zero voltage. However, during the removal process, an electrical arc occurred when a wire shorted to the ground. The PE electricians immediately ceased the work and proceeded to place the area in a safe configuration in accordance with the Integrated Work Document (IWD). During the activity to safe the work, a second arc was observed. All electrical work in the area was then paused. The energy source was isolated with a lockout tagout of the electrical panel and a zero voltage verification was performed. The area was isolated to prevent further activity until a critique of the event could be held and a path forward determined.

On January 16, 2013, a critique was held where the Radiological and Chemistry Operations (RCO) Operations Manager (OM) confirmed the initial categorization of 2E(2) “Any unexpected discovery of an uncontrolled electrical hazardous energy source.”

#### BACKGROUND

In June 2012 Los Alamos National Security, Inc. awarded the TA59 Building 1 Upgrade Project to J.B. Henderson. Work on the project commenced in July 2012. There are three elements to the project: 1) laboratory remodeling, 2) boiler replacement, and 3) fire protection correction work. The work being performed in this event was related to the laboratory remodeling phase of the project. Pueblo Electric is a lower tier subcontractor to J.B. Henderson.

Construction of TA59-1 was completed in 1967. The electrical panels relevant to this event are original installation. Original electrical drawings do not include detailed electrical information. Therefore, electricians are dependent on the information provided on the electrical panel schedule and labeling on individual electrical plugs, etc. (as provided) for detailed information regarding circuitry, etc.

#### Cause Description:

#### ISM SUMMARY

There was no ISM weakness in this event. The IWD (reference JBH-FRM-1220-1 R2) included a caution statement in Work Tasks/Step 2 “Demolition and Installation of Electrical Equipment and Systems” that states legacy and pass-through circuits will likely remain and provides actions for managing these circumstances. The LO/TO was performed according to procedure. Upon discovery of unexpected energized wiring in the conduit, the PE electricians demonstrated an understanding of the caution statement in the IWD by correctly performing the necessary steps to safe the situation and pause work.

#### EXTENT OF CONDITION

The FOD 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 results are as follows:

- 1) LANL Project Management added an EOC to the scope of the contract for J.B. Henderson, to include:
  - a. The replacement of the two (2) electrical panels relevant to this event with electrical panels provided by LANL;
  - b. J.B. Henderson will coordinate with LANL electrical inspectors to identify code violations, or immediate safety issues that must be addressed in the remaining panels in TA59-1; and
  - c. Panel schedules are to be updated with circuit tracing.
- 2) Upon completion of the TA59 Building 1 Upgrade Project, the LANL Institutional and Site Planning Manager has agreed to fund an additional

project that will upgrade the electrical systems in the building, incorporating the results of the EOC.

Detailed documentation of the EOC will be/is available as part of the LANL Performance Feedback Issues Tracking System (PFITS) record PFITS 2013-144.

#### INVESTIGATIVE METHODOLOGY

Apparent Cause Analysis and the Causal Analysis Tree, as described in the DOE Occurrence Reporting Causal Analysis standard (DOE-STD-1197-2011), 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 apparent cause(s) identified for this event are:  
A1B3C02 Design/documentation not up-to-date; and  
A5B2C04 Equipment identification LTA.

#### CAUSAL ANALYSIS

##### APPARENT CAUSE

The apparent cause in this event was the unidentifiable, energized legacy wiring that was present in the conduit that was being demolished.

The original building drawings did not provide a level of detail regarding the circuits and the electricians were dependent on the panel schedules, labeling (where provided), and zero voltage checks for identification of LO/TO points. Although there was evidence that an attempt to trace wiring to circuits with updated panel schedules and labeling of outlets took place in the past, it appears as though the energized wire in this event was not identifiable until the actual pulling of wires took place as part of the demolition project.

There was no procedural non-compliance in this event. With the information available to the PE electricians, the LO/TO procedure was performed accurately. When it was apparent there was an energized wire within the conduit, the IWD direction was to isolate and safe the system, and pause work.

The cause codes that best describe the apparent cause are A1B3C02 “Design/documentation not up-to-date” as the original building drawings did not include detailed electrical information, and A5B2C04 “Equipment identification LTA” because the panel schedule did not

accurately reflect the circuit mapping.

Corrective actions 1, 2, 3, and 4 address these cause codes.

**Operating Conditions:**

Normal

**Activity Category:**

Construction

**Immediate Action(s):**

1. The energy source was isolated with a lockout tagout of the electrical panel and a zero voltage verification was performed.
2. Electrical work in the area was paused until a safe path forward was determined.
3. The work area was isolated to prevent access until a safe path forward was determined.

**FM Evaluation:**

The investigation adequately described the events. The actions taken by the facility appropriately placed the affected area in a safe configuration. The proposed corrective actions will prevent recurrence of this event.

**DOE Facility Representative**

**Input:**

**DOE Program Manager**

**Input:**

**Further Evaluation is Required:**

No

**Division or Project:**

Project Management

**Plant Area:**

TA59-1

**System/Building/Equipment:** TA59-1 Electrical System

**Facility Function:**

Laboratory - Analytical

**Corrective Action 01:**

<b>Target Completion</b> <b>Date:02/28/2013</b>	<b>Actual Completion</b> <b>Date:02/28/2013</b>
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REVISION OR EXTENSION OF THIS ACTION REQUIRES FACILITY OPERATIONS DIRECTOR APPROVAL.

Title: Replace Electrical Panels.

Action: Replace the two electrical panels relevant to this event with electrical panels provided by LANL.

Deliverable: Install new electrical panels

Responsible Organization: RCO-OPS

Target Due Date: 3/29/2013

See PFITS Issue 2013-144, Action 1 for action closure and objective evidence.

This action addresses cause code A1B3C02 Design/documentation not up-to-date.

NOTE: This action has been closed in ORPS based on the documented completion of the Performance Feedback Improvement Tracking entry.

**Corrective Action 02:**

<b>Target Completion</b> <b>Date:02/28/2013</b>	<b>Actual Completion</b> <b>Date:02/28/2013</b>
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REVISION OR EXTENSION OF THIS ACTION REQUIRES FACILITY OPERATIONS DIRECTOR APPROVAL.

Title: Verify Code Status of Remaining Electrical Panels Relative to the Project.

Action: Coordinate with J.B. Henderson and LANL electrical inspectors to identify code violations, or immediate safety issues that must be addressed in the remaining panels in TA59-1.

Deliverable: Documented evaluation results

Responsible Organization: MOF-PM7

Target Due Date: 8/30/2013

See PFITS Issue 2013-144, Action 2 for action closure and objective evidence.

This action addresses cause code A1B3C02 Design/documentation not up-to-date.

NOTE: This action has been closed in ORPS based on the documented completion of the Performance Feedback Improvement Tracking entry.

**Corrective Action 03:**

<b>Target Completion</b> <b>Date:02/28/2013</b>	<b>Actual Completion</b> <b>Date:02/28/2013</b>
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REVISION OR EXTENSION OF THIS ACTION REQUIRES FACILITY OPERATIONS DIRECTOR APPROVAL.

Title: Update Panel Schedules.

Action: Update panel schedules using circuit tracing.

Deliverable: Copy of the updated panel schedules.

Responsible Organization: MOF-PM7

Target Due Date: 8/30/2013

See PFITS Issue 2013-144, Action 3 for action closure and objective evidence.

This action addresses cause code A1B3C02 Design/documentation not up-to-date.

NOTE: This action has been closed in ORPS based on the documented completion of the Performance Feedback Improvement Tracking entry.

**Corrective Action 04:**

<b>Target Completion</b> <b>Date:02/28/2013</b>	<b>Actual Completion</b> <b>Date:02/28/2013</b>
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REVISION OR EXTENSION OF THIS ACTION REQUIRES FACILITY OPERATIONS DIRECTOR APPROVAL.

Title: Upgrade the Electrical Systems

Action: The LANL Institutional and Site Planning Manager to propose an upgrade to the electrical systems in the TA59 Building 1, incorporating the results of the Extent of Condition.

Deliverable: Funding determination and project schedule (pending funding approval).

Responsible Organization: RCO-OPS

Target Due Date: 3/30/2014

See PFITS Issue 2013-144, Action 4 for action closure and objective evidence.

This action addresses cause code A5B2C04 Equipment identification LTA.

NOTE: This action has been closed in ORPS based on the documented completion of the Performance Feedback Improvement Tracking entry.

**Lessons(s) Learned:**

**HQ Keywords:**

- 01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control
- 01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical)
- 08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance
- 08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical)
- 11G--Other - Subcontractor
- 12I--EH Categories - Lockout/Tagout (Electrical or Mechanical)

14D--Quality Assurance - Documents and Records Deficiency  
 14E--Quality Assurance - Work Process Deficiency  
 14G--Quality Assurance - Procurement Deficiency

**HQ Summary:**

On January 15, 2013, an electrical subcontractor observed an electrical arc when a wire shorted to ground while removing a 110-volt circuit believed to be de-energized at Technical Area 59, Building 1. The subcontractor was not shocked. The arc occurred during electrical demolition for an upgrade project. The subcontractor followed appropriate procedures to isolate and de-energize the circuit believed to be associated with the conduit to be removed, including a zero voltage check using a voltmeter at a receptacle and proximity tests. The subcontractor isolated the energy source with a lockout tagout of an electrical panel and verified zero voltage.

**Similar OR Report Number:** 1. NA--LANL-LASO-HEMACHPRES-2012-0002

**Facility Manager:**

Name	Steve Antimary
Phone	(505) 664-0473
Title	Acting RCO Facility Operations Director

**Originator:**

Name	TANNER, KIMBERLI K
Phone	(505) 665-8197
Title	OCCURRENCE INVESTIGATOR

**HQ OC Notification:**

Date	Time	Person Notified	Organization
NA	NA	NA	NA

**Other Notifications:**

Date	Time	Person Notified	Organization
01/15/2013	12:00 (MTZ)	Randi Allen	NNSA

**Authorized Classifier(AC):** Kimberli Tanner Date: 04/08/2013

**7)Report Number:**

[NE-ID--BEA-SMC-2013-0001](#) After 2003 Redesign

**Secretarial Office:**

Nuclear Energy, Science and Technology

**Lab/Site/Org:**

Idaho National Laboratory

**Facility Name:**

Specific Manufacturing Capability

**Subject/Title:**

Identification of a uncontrolled hazardous energy source on a completed LOTO

**Date/Time Discovered:**

01/21/2013 14:45 (MTZ)

**Date/Time Categorized:**

01/21/2013 16:45 (MTZ)

**Report Type:**

Final

**Report Dates:**

Notification	01/23/2013	18:25 (ETZ)
Initial Update	03/11/2013	18:03 (ETZ)
Latest Update	03/28/2013	15:30 (ETZ)

Final	03/28/2013	15:30 (ETZ)
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**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:** A4B3C09 - Management Problem; Work Organization & Planning LTA; Work planning not coordinated with all departments involved in task  
A3B2C04 - Human Performance Less Than Adequate (LTA); Rule Based Error; Previous success in use of rule reinforces continued use of rule  
-->couplet - NA

**ISM:** 2) Analyze the Hazards  
3) Develop and Implement Hazard Controls

**Subcontractor Involved:** No

**Occurrence Description:** During the annual review of the SMC Lockout Tagout program (LOTO), one of the record sheets reviewed that was developed, worked and closed out on 17 Jan 2013 was identified as suspect in the installation of a tag on a Uninterruptible Power supply (UPS). An investigation was initiated and the UPS cabinet panel cover was opened. Upon inspection, it was identified that a circuit in the cabinet, not on the LOTO, supplied 120V power to an exposed E-Stop Interlock relay. The work package being worked at the time was to install fiber optic Ethernet cables inside the cabinet for a control upgrade project. No electrical work was being performed and no injuries occurred as a result of this issue.

**Cause Description:** Facility configuration drawings used to identify the lockout tagout points were designed for total line isolation and did not contain the depth of information needed in this case to isolate a small section of the equipment. The job scoping failed to ensure that all multiple power feeds that would be isolated by a total isolation, were covered in this application.

**ANALYSIS**  
An Event and Casual Factors Chart (E&CF) was used to identify the sequence of events and causal factors contributing to this event. In addition, a Target-Barrier Analysis was performed to identify the process barriers that were not effective in preventing this event. The event was also evaluated against the Integrated Safety Management System (ISMS) core functions to identify gaps in the ISMS process.

Summary of Events and Causal Factors Chart

This analysis tool is useful in identifying multiple causes and graphically depicting the triggering conditions and events necessary for an event to occur. The E&CF revealed weaknesses that resulted in less-than-adequate preparation and conduct of the LO/TO. Three issues that contributed to this event were identified as Causal Factors.

#### Summary of Target-Barrier Analysis Chart

The Target-Barrier Analysis Chart is used in event investigation to examine an event by analyzing the hazards associated with an event and the barriers that should have been in place to prevent it. Barrier Analysis is based on the premise that barriers are developed and integrated into a system or work process to protect personnel and equipment from hazards.

The Target-Barrier Analysis resulted in the identification of multiple process barriers that did not function as expected for this event. This analysis validated the results of the E&CF analysis and was incorporated into the causal factors.

#### ISMS Core Functions Integrated Safety Management System (ISMS)

Reportable events require a specific analysis of the five ISMS Core Functions to identify the core functions that were not met in relation to the event. This investigation revealed the following:

1. Core Function 1 - Define the Scope of Work Missions are translated into work, expectations are set, tasks are identified and prioritized, and resources are allocated.

Core Function was met.

The scope of work for the Line 6 upgrade project was adequate. The work order correctly identified the work to be completed and provided the necessary information to provide an understanding of the hazards imposed.

2. Core Function 2 - Analyze the Hazard - Hazards associated with the work are identified, analyzed, and categorized.

Core Function was not met.

SMC personnel conducting this LOTO evolution did not utilize all available resources to identify the existing hazards associated with the work order. The walk-down and review of drawings for the preparation phase of the LOTO was less than adequate and resulted in the potential for performing work in the vicinity of a hazardous energy source. In addition, the FAS and the AE relied on the System Engineers review of

drawings, rather than providing a backup to the Engineers evaluation. This resulted in a single point failure with the System Engineer.

3. Core Function 3 - Develop and Implement Hazard Controls

Applicable standards and requirements are identified and agreed upon, controls to prevent- mitigate hazards are identified, the safety envelop is established, and controls are implemented.

Core Function was not met.

The team conducting the LOTO included adequate hazard controls for the identified hazards on the LOTO record sheet A key tenet of the LOTO process was not followed however, the signatures of the AE and the FAS on the LOTO record sheet should indicate that they have conducted a thorough review of all resources to adequately verify that all energy sources have been identified.

4. Core Function 4 - Perform Work within Controls

Readiness is confirmed and work is performed safely.

Core Function was met.

The scope of work consisted of installing fiber optic cable in the Line 6-1 control cabinet. Although the planning walk down did not identify and mitigate all energy sources in the LOTO record sheet (see core function 2 and 3) the work was performed within the established work control.

5. Core Function 5 - Provide Feedback and Continuous Improvement

Feedback information on the adequacy of controls is gathered, opportunities for improving the definition and planning of work are identified and implemented, line and independent oversight is conducted, and, if necessary, regulatory enforcement action occur.

Core Function was met.

The Job was considered to have proceeded satisfactorily. Once the deficient condition was discovered, appropriate actions were taken to report the event, investigate the cause of the deficient condition, and to learn from it.

Casual Factors and Cause Codes

Causal Factor 1: Inadequate coordination of resources between Maintenance, Operations, and Engineering resulted in less than adequate attention to the LOTO process.

Cause Code: A4 Management Problem, B3 Work Organization and Planning LTA, C09 Work planning not coordinated with all departments involved in a task.

The practice at SMC to authorize and coordinate maintenance work using the Plan of the Week -Plan of the Day process is heavily focused on maintenance resources required to conduct the work. Of less consideration is the resources, time, and planning by Operations and Engineering personnel to successfully execute the LOTO process. The preparation for the Line 6 LOTO did not begin until the day the maintenance was scheduled to start. This common practice at SMC often results in a self-imposed sense of time pressure to ensure that Operations personnel are not a cause of delay for maintenance personnel. Additionally, the coordination between various maintenance events was less than adequate. The maintenance on Line 6 was scheduled on the Plan of the Day as the #1 priority job for the day. Another job occurring in TAN-679 to perform calibration of ventilation flow detectors was not identified as a priority on the Plan of the Day. The job in TAN-679, however, was considered by the Shift Assistant and the System Engineer to be important and if not completed by the end of the week would have required compensatory measures to be taken. This condition led the Shift Assistant and Shift Engineer to focus more attention on the job in TAN-679.

This cause is addressed in CA-4 and 5.

Causal Factor 2: The Facility Area Supervisor and the System Engineer did not provide adequate attention and priority to the LOTO.

Cause Code: A3 Human Performance LTA, B2 Rule Based Error, C04 Previous success in use of rule reinforced continued use of rule.

The Shift Assistant and System Engineer were involved with work in multiple locations. While this condition is not unusual, both individuals allowed themselves to be preoccupied with the job in another building and did not devote adequate attention to the Line 6 LOTO preparation. Contributing to their detracted attention was that the LOTO on Line 6 would be a simple evolution due to multiple instances of successful LOTOs on Line 6 in the past and a minimal scope of work associated with this work order. This cause is addressed in CA-5.

Causal Factor 3: The team preparing the LOTO did not utilize all available indications to thoroughly determine all sources of hazardous energy.

Cause Code: A3 Human Performance LTA, B2 Rule Based Error, C04 Previous success in use of rule reinforced continued use of rule.

The process used for identifying sources of energy for the Line 6 LOTO was focused on a walk-down of the power panels that fed the control cabinet. The team did not adequately utilize all available information to fully evaluate the sources of power entering the control cabinet. This resulted in the team missing a label on the cabinet identifying an additional source of electrical energy. The AE and FAS relied on the Engineer's expertise in the review of drawings rather than obtain first-hand knowledge that all sources were identified. This led to a single-point failure with the engineer when he utilized a drawing that did not include sufficient detail for the scope of the work. This cause is addressed in CA-6.

An facility extent of conditions will be performed under corrective action number 7, Determine if labels on multiple power sources are correct. If problems are identified additional actions will be issued.

**Operating Conditions:**

Does not apply

**Activity Category:**

Maintenance

**Immediate Action(s):**

SMC Management and DOE were notified. All work on existing lock and tags was been paused pending a critique, scheduled for 01/23/13 at 0830

**FM Evaluation:**

Facility configuration drawings used to identify the lockout tagout points were designed for total line isolation and did not contain the depth of information needed in this case to isolate a small section of the equipment. The job scoping failed to ensure that all multiple power feeds that would be isolated by a total isolation, were covered in this application.

UPDATE 03-11-13. An extension request of 20 days is required based on the loss of computer systems at the facility causing delays in the casual analysis completion. The cause analysis was approved on 03-07-13 and corrective action plan will be completed by 03-28-13. The DOE FR has been notified and agrees with the extension.

**DOE Facility Representative**

**Input:**

**DOE Program Manager**

**Input:**

**Further Evaluation is Required:**

No

**Division or Project:**

SMC

**Plant Area:**

TAN 629

**System/Building/Equipment:**

TAN 629 Assembly area

**Facility Function:**

Uranium Conversion/Processing and Handling

<b>Corrective Action 01:</b>	<b>Target Completion</b> <b>Date:</b> 03/21/2013	<b>Tracking ID:</b> IO:SMC 002065 - AI:SMC-00737
Perform a Level 1 Root Cause Analysis (INL/INT 13 28365)		
<b>Corrective Action 02:</b>	<b>Target Completion</b> <b>Date:</b> 03/28/2013	<b>Tracking ID:</b> IO:SMC 002065 - AI:SMC 00738
Develop a corrective action plan based on the Level 1 cause analysis		
<b>Corrective Action 03:</b>	<b>Target Completion</b> <b>Date:</b> 03/30/2014	<b>Tracking ID:</b> IO:SMC 002065 AI:SMC 00739
Perform an effectiveness assessment		
<b>Corrective Action 04:</b>	<b>Target Completion</b> <b>Date:</b> 04/30/2013	<b>Tracking ID:</b> IO:SMC 002065 AI:SMC 00750
Revise current work planning and coordination process to proactively assign time and resources for LO/TO performance during Plan of the Week/Plan of the Day "POW/POD" meetings.		
<b>Corrective Action 05:</b>	<b>Target Completion</b> <b>Date:</b> 04/30/2013	<b>Tracking ID:</b> IO:SMC 002065 AI:SMC 00751
Operations Manager provide a communication to qualified Shift Supervisors, Shift Assistants and foremen on lessons learned from this event and tools to be used for Resource/Management/Coordination decisions.		
<b>Corrective Action 06:</b>	<b>Target Completion</b> <b>Date:</b> 04/30/2013	<b>Tracking ID:</b> IO:SMC 002065 AI:SMC00752
Issue a Lessons Learned to Operations and Engineering Personnel reinforcing the LWP 9400 requirements regarding the use of all available resources, including current drawings as appropriate to the scope of the LO/TO.		
<b>Corrective Action 07:</b>	<b>Target Completion</b> <b>Date:</b> 07/30/2013	<b>Tracking ID:</b> IO:SMC 002065 AI:SMC 00753
Determine if labels on multiple power sources are correct.		
<b>Lessons(s) Learned:</b>	None	
<b>HQ Keywords:</b>	01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous) 01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control 01M--Inadequate Conduct of Operations - Inadequate Job Planning (Electrical) 01R--Inadequate Conduct of Operations - Management issues 08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance 12C--EH Categories - Electrical Safety	

14D--Quality Assurance - Documents and Records Deficiency  
 14E--Quality Assurance - Work Process Deficiency

**HQ Summary:**

On January 21, 2013, during the annual review of the Specific Manufacturing Capability Lockout Tagout (LOTO) program, a record sheet reviewed for previous work was identified as suspect in the installation of a tag on an Uninterruptible Power supply (UPS). An investigation of the UPS cabinet panel revealed that a circuit in the cabinet, not on the LOTO, supplied 120-volt power to an exposed E-Stop Interlock relay. The work package being worked at the time was to install fiber optic Ethernet cables inside the cabinet for a control upgrade project. No electrical work was being performed and no injuries occurred as a result of this issue. All work on existing lock and tags has been paused pending a critique and appropriate notifications were made.

**Similar OR Report Number:** 1. NE-ID--BEA-SMC-2012-0003  
 2. NE-ID--BEA-SMC-2011-0010

**Facility Manager:**

Name	Jeff Allen
Phone	(208) 526-1736
Title	SMC Operations Manager

**Originator:**

Name	GRIFFIN, KARL W
Phone	(208) 526-4168
Title	STAFF SPECIALIST

**HQ OC Notification:**

Date	Time	Person Notified	Organization
NA	NA	NA	NA

**Other Notifications:**

Date	Time	Person Notified	Organization
01/21/2013	16:50 (MTZ)	John Martin	DOE-ID

**Authorized Classifier(AC):** Jeff Fluckiger      Date: 03/28/2013

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