



Office of Health, Safety and Security



Monthly Analysis of Electrical Safety Occurrences

November 2011

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 eight in October to twelve in November and the number of reported electrical shocks increased from two to four. Also the number of electrical intrusion occurrences increased from one in October to five in November. There were only five occurrences involving subcontractors this month; however, four of these occurrences resulted in electrical intrusions, one by penetration and three by excavation.

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 November occurrence reports is provided in Attachment 2.

Electrical Shock

There were four occurrences in November that resulted in an electrical shock. All four occurrences involved non-electrical workers, with three of them coming in contact with damaged equipment or inadequately bonded/grounded systems. The occurrences are summarized below.

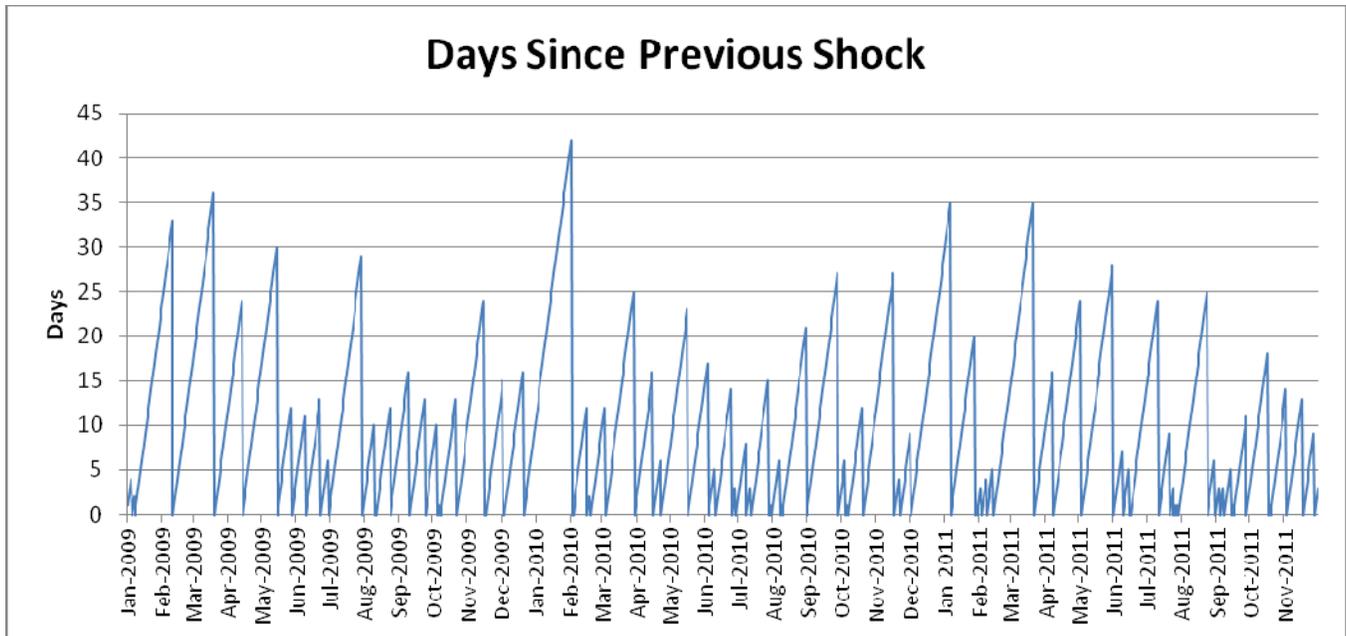
1. A landlord technician, who was assembling cubicle panel walls, received a mild electrical shock to his right hand when he inadvertently brushed his fingers against energized electrical conductors that were exposed by a broken molded plastic connector that had fallen off of the electrical power wiring system on the bottom of the cubicle wall panel he was installing. A look on the other side of the panel revealed the

exposed electrical conductors. The technician most likely had slipped his hand under the cubicle wall while attempting to plug in the molded jumper and brushed his fingers on the exposed conductors. The technician did not inspect the cubicle wall panel electrical wiring system before attempting to assemble the panels. Electricians checked the connectors and discovered 120/208 VAC on the conductors. They de-energized and removed the cubicle panel with the broken electrical connector from service.

2. An employee experienced a mild shock while making connections from a computer and monitor to a power cord located beneath a workstation.
3. Two Advanced Photon Source workers were pulling non-energized computer network cables above a suspended ceiling in a conference room when one worker felt a tingling sensation in an arm that had touched a ceiling tile grid. A grounding problem was found with a light fixture that is supplied from a 277-volt source. Investigators are not sure how the fixture was installed or how the fixture grounding was designed or fabricated. The lighting fixture has a UL label. The manufacturer was contacted to obtain detailed information regarding installation instructions.
4. An employee received an electrical shock when he attempted to turn off the 120-volt lights (touched the knob and plate on wall switch) while exiting a building. The employee was not injured and was taken to the occupational medical clinic for evaluation and released. The electrical circuit supplying power to the switch was locked and tagged out. Investigators determined that there was a bonding problem with the external electrical conduit for the circuit, which is a legacy installation problem.

Figure 1 shows the number of days since the previous electrical shock for the DOE complex. The present interval is 3 days. The longest interval was 41 days in 2010.

Figure 1 - Days since Previous Shock



Electrical Intrusion

In November, the number of electrical intrusion occurrences (i.e., cutting/penetrating, excavating, or vehicle contact of electrical conductors) increased from one in October to five this month. The occurrences are summarized below.

1. A construction contractor cut a conduit, which carried 277 volt power (20 amps) conductors that supply pole lights on the upper level of a parking garage. While the contractor was removing the defective concrete in the parking garage the next day, a conduit encased in the poured concrete was discovered to have been cut by the concrete saw. The circuit was de-energized at the time it was cut and found because it is controlled by a photo-cell. The circuit was not controlled nor locked out while the concrete removal work was being performed. The contractor was not provided a copy of any electrical drawings for the parking garage because there was no electrical system modification or maintenance planned in their statement of work. The electrical drawings for the parking garage do not show the location of as-built electrical conduits.
2. While digging a trench to install a new natural gas line, a construction contractor's backhoe hit a buried conduit containing 480-volt wiring. The conduit was buried about 15-inches deep with a red warning tape laid above it; however, the warning tape was hit at the same time the conduit was severed. The conduit was later determined to provide electrical power to area street lights, which were not energized because the system photo-sensor was not activated. A digging permit had been and no utility lines were identified based on site drawings. An appropriate detection device was not used to verify that any utility lines were present. At some time before the event, another construction contractor had installed the underground electric line but the updated information had not been entered on the site drawing.
3. While installing a fence post and parking barriers, a service subcontractor hit a de-energized conduit containing 480-volt conductors. A subsurface investigation had been completed; however, the subsurface investigation was only within the parameters of the main disconnect which did not include the area where the conduit was located. No other subsurface investigation had been completed before the installation of the fence posts. The service subcontract foreman indicated that he knew there was conduit near the area where he was installing the fence post because of previous work. The subcontractor used a shovel to dig approximately 27-inches deep and found no obstructions. He then used a mechanical auger to drill the fence post hole deeper, hitting the PVC conduit and wrapping it around the auger. The circuit breaker that controlled power to the conduit was off; however, it was not controlled by a lockout/tagout device.
4. An excavation subcontractor struck a metallic electrical conduit for a parking lot light fixture while digging. The conductors of the 277-volt lighting circuit were not energized as the timer used to control the light had not yet activated the circuit. The electrical utility restrictor had authorized digging east of the sidewalk but not west of the sidewalk where a lighting fixture was located. The dig permit drawing showed that the buried electrical line crossed the area where the digging occurred; and described the

line as "UE" (underground electrical) with 2 feet of cover. The parking lot was marked with red paint indicating the underground electrical leading up to the parking lot light. The sidewalk light pole in the area of the digging was also marked at its base with red paint. The permit stated: "Restrictor must be present when digging within 3'-0" of utilities, electric, telephone, gas and sewer" and "Hand dig around any electric, telephone, utilities, gas, or sewer until the line is fully exposed." No dig restrictor was present and the line was hit by an excavator, as opposed to during hand digging.

5. While constructing a floor, a contract worker inadvertently drove a screw into a metallic sheathed "BX" cable causing a 277-volt energized conductor too short to the grounded metallic sheath. The installed circuit breaker tripped as designed in response to the short. The worker did not receive an electrical shock. No further damage occurred. All work was stopped and the electrical line was locked and tagged out until an investigation could be completed.

Hazardous Energy Control

In November there were two reported occurrences involving lockout/tagout (LOTO) issues. This is a decrease from the five occurrences reported in October. These two occurrences involved not installing LOTO devices when required. It can't be stressed hard enough, that establishing an electrically safe work condition also needs to include some form of positive control over the source of energy.

1. A subcontractor, who was supporting work to relocate a sensor, shut off an electrical circuit breaker without performing the required LOTO steps (i.e. hanging a lock and tag, as required). The subcontractor relocated the sensor and then reset the breaker without incident or injury. This was a violation of the required LOTO procedure.
2. During the installation of a fence post and parking barriers, a service subcontractor hit a de-energized conduit containing 480-volt conductors. The circuit breaker that controlled power to the conduit was off; however, it was not controlled by a LOTO device.

Electrical Near Miss

In November there were five occurrences that were considered to be an electrical near miss. One of these occurrences involved an operator who used a paperclip instead of a non-conductive tool (as required) to reset a shunt to a power supply. The metal paperclip was inserted into a pencil-point-sized reset hole on the front of the chassis. Inserting a conductive element into the chassis exposed the operator to the operating voltage of the power supply. If the end of the paperclip had been mis-directed or touched another element of the shunt card and not the plastic end of the reset button, the operator could have received a shock. As an immediate action, danger labels were placed over shunt reset openings and two non-conductive reset tools were placed at each shunt chassis. The other four near-miss occurrences were summarized in Electrical Intrusion occurrences number 1, 2, 4, and 5.

Monthly Occurrences Tables

Table 1 shows a breakdown of the outcomes, performance issues, and worker types associated with the electrical safety occurrences for November 2011.

Table 1 - Breakdown of Electrical Occurrences

Number of Occurrences	Involving:	Last Month
4	Electrical Shocks	2
0	Electrical Burns	0
2	Hazardous Energy Control	5
1	Inadequate Job Planning	0
2	Inadvertent Drilling/Cutting of Electrical Conductors	0
3	Excavation of Electrical Conductors	1
0	Vehicle Intrusion of Electrical Conductors or Equipment	0
5	Electrical Near Misses	3
2	Electrical Workers	3
10	Non-Electrical Workers	5
5	Subcontractors	2

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 initially 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

The search produced thirteen occurrence reports and one occurrence ([NA--SS-SNL-2000-2011-0003](#)) was culled out because it was a conduct of operations issue regarding explosive safety.

Table 2 provides a summary of the electrical safety occurrences for CY 2011.

Table 2 - Summary of Electrical Occurrences

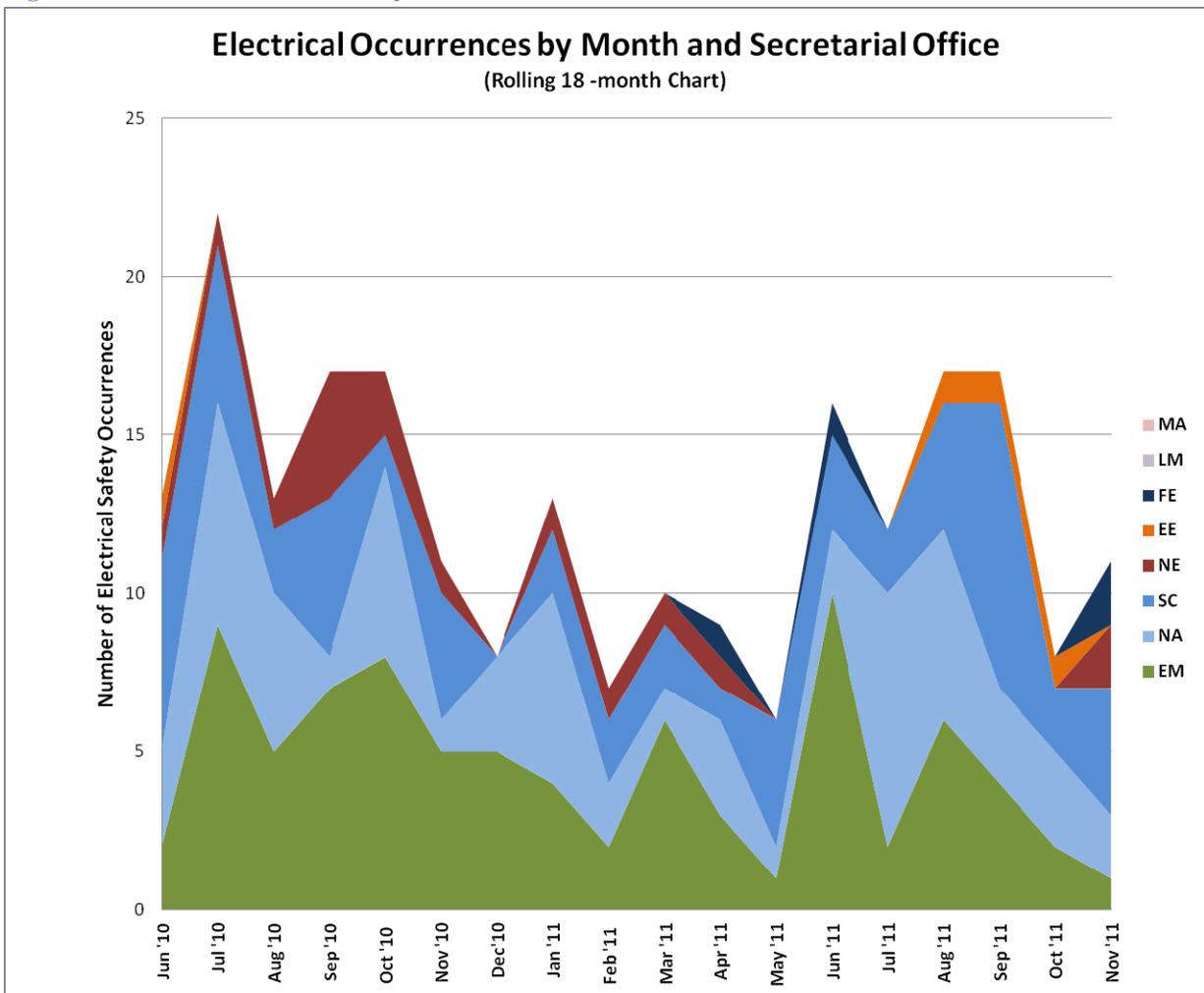
Period	Electrical Safety Occurrences	Shocks	Burns	Fatalities
November	12	4	0	0
October	8	2	0	0
September	17	7	2	0
August	17	2	0	0
July	12	5	0	0
June	16	5	1	0
May	6	1	0	0
April	9	1	0	0
March	10	1	0	0

Period	Electrical Safety Occurrences	Shocks	Burns	Fatalities
February	7	3	0	0
January	13	3	1	0
2011 total	127 (avg. 11.5/month)	34	4	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

The monthly average for 2011 remained the same as last month at 11.5 occurrences. The reported number of electrical shocks is now averaging 3 per month.

Figure 2 shows the distribution of electrical safety occurrences by Secretarial Office, with Environmental Management with the fewest reports and Science with the most reports.

Figure 2 - 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. Two of the electrical occurrences did not have an ES score. The other ten occurrences are classified as shown in Table 3. The actual score for each occurrence is provided in Attachment 1.

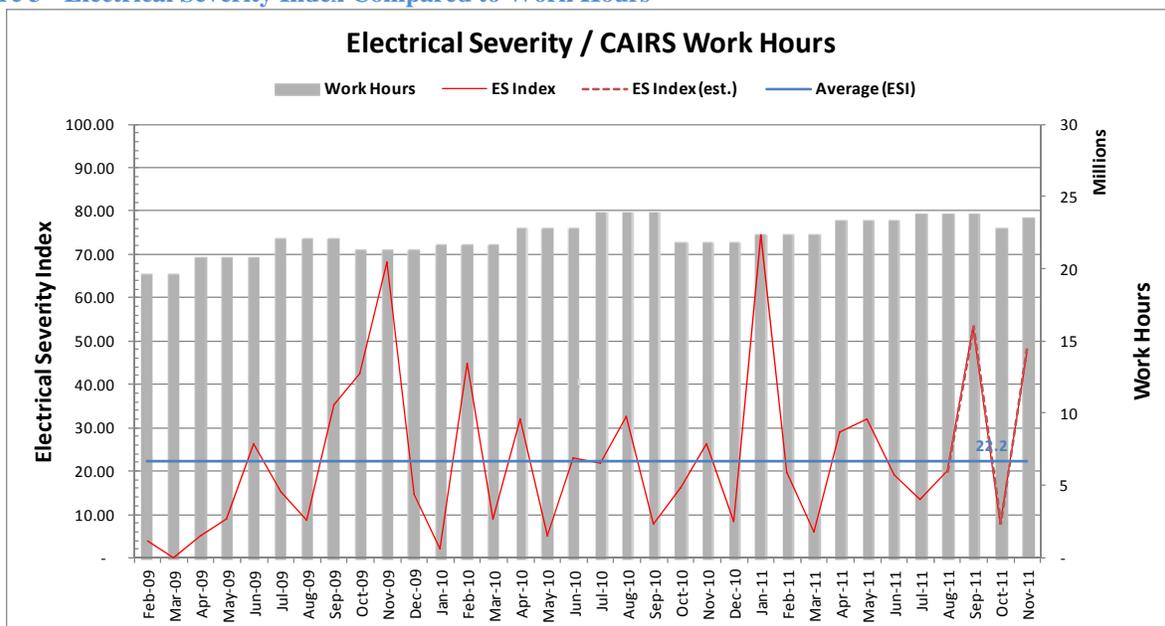
Table 3 – Classification of Electrical Safety Occurrences by ES Score

Occurrence Classification	Electrical Severity Score	Number of Occurrences
HIGH	≥ 1750	0
MEDIUM	31-1749	8
LOW	1-30	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 3 shows a calculated ESI for the DOE complex and Table 4 shows the ESI and how it has changed from the previous month.

Figure 3 - 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

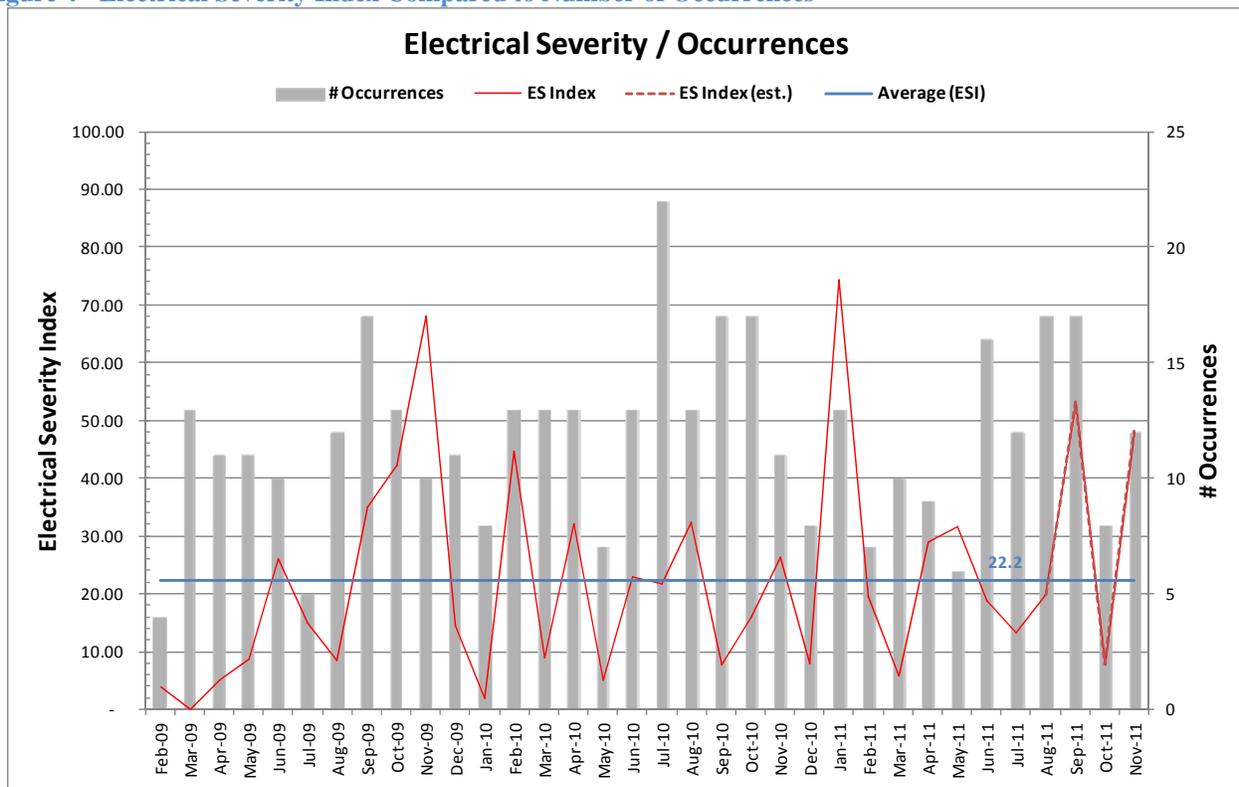
Category	October	November	Δ
Total Occurrences	8	12	+4
Total Electrical Severity	890	5,630	+4,740
Estimated Work Hours	22,813,543* (22,813,543)	23,416,950	+603,407
ES Index	7.80* (55.92)	48.08	+40.28
Average ESI	21.5	22.2	+0.7

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

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

Figure 4 shows the ESI with the number of Occurrences instead of Work Hours.

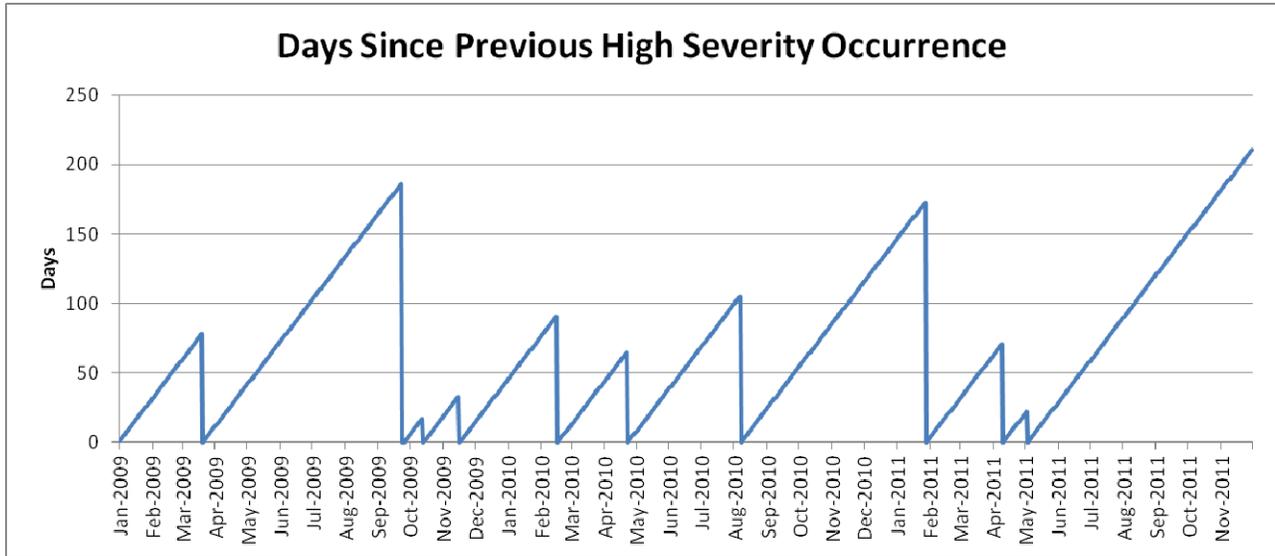
Figure 4 - Electrical Severity Index Compared to Number of Occurrences



The average ESI has increased from 19.2 in June 2010 to 22.2 in November 2011.

Figure 5 shows the number of days since the previous high severity occurrence. The present interval is 211 days. The previous longest interval was 181 days in 2009.

Figure 5 - Days since Previous High Severity Occurrence



Summary of Occurrences by Severity Band

For the interval November 2010 through November 2011 (current month and the past 12), Figures 6 and 7 summarize occurrences by severity band and month of discovery date by percentage of total occurrences in month and number of occurrences in month.

Figure 6 - Occurrences by Electrical Severity Band (Percentage)

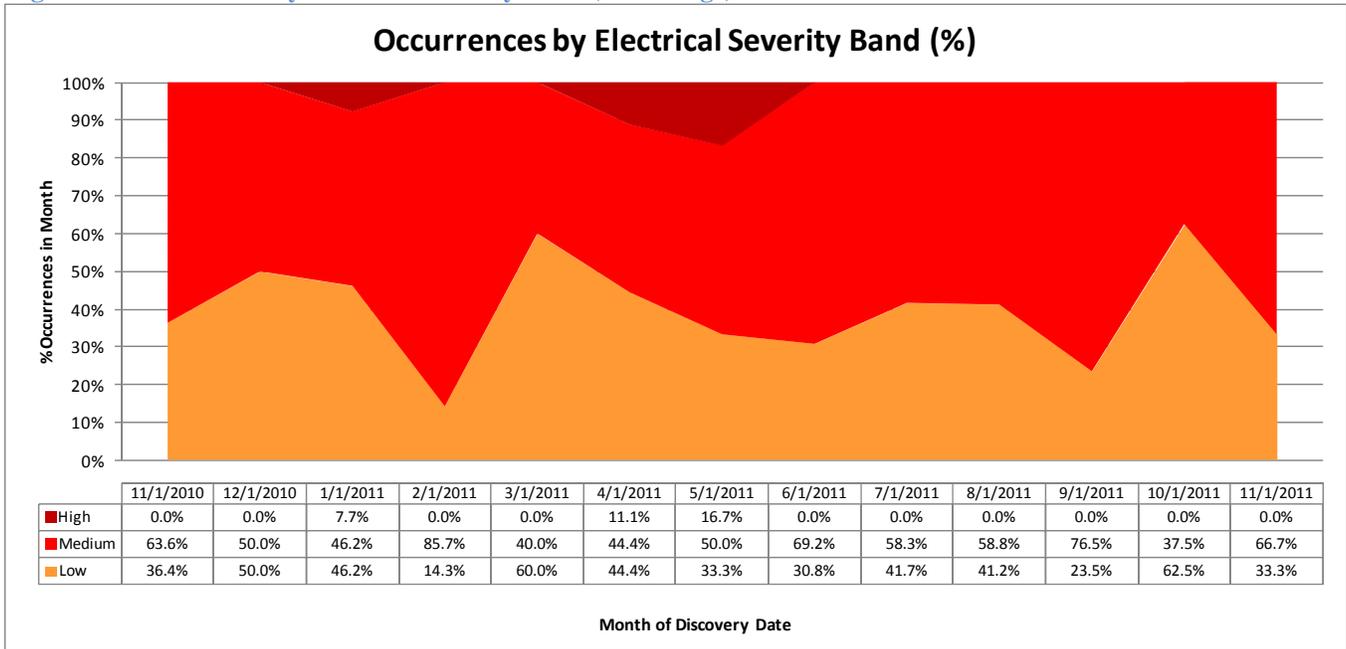
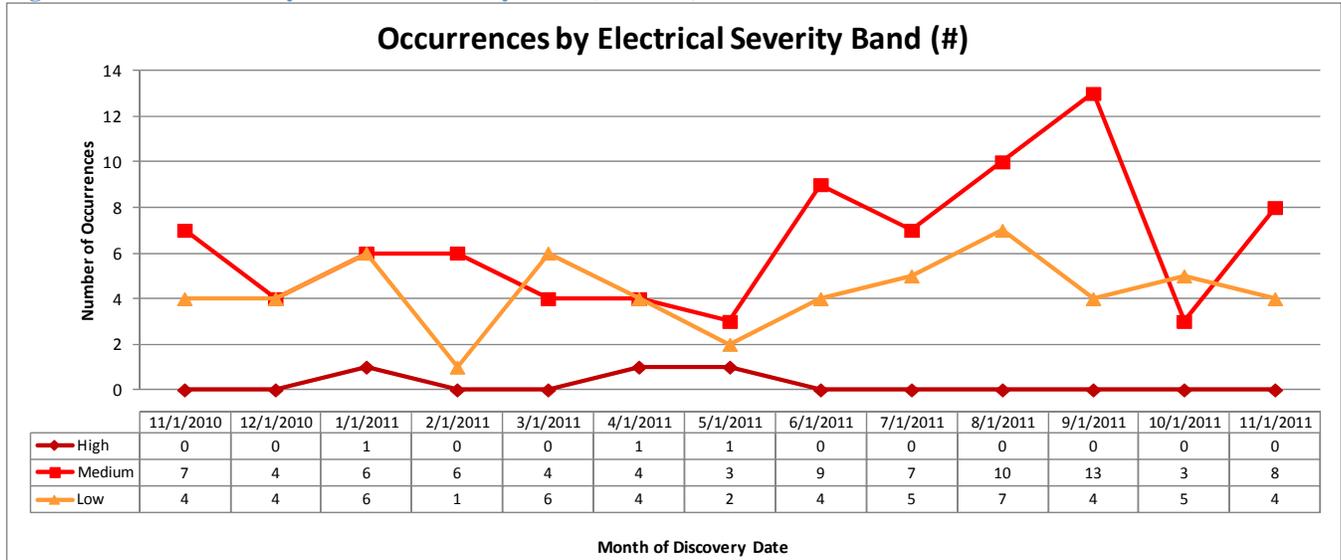


Figure 7 - Occurrences by Electrical Severity Band (Number)

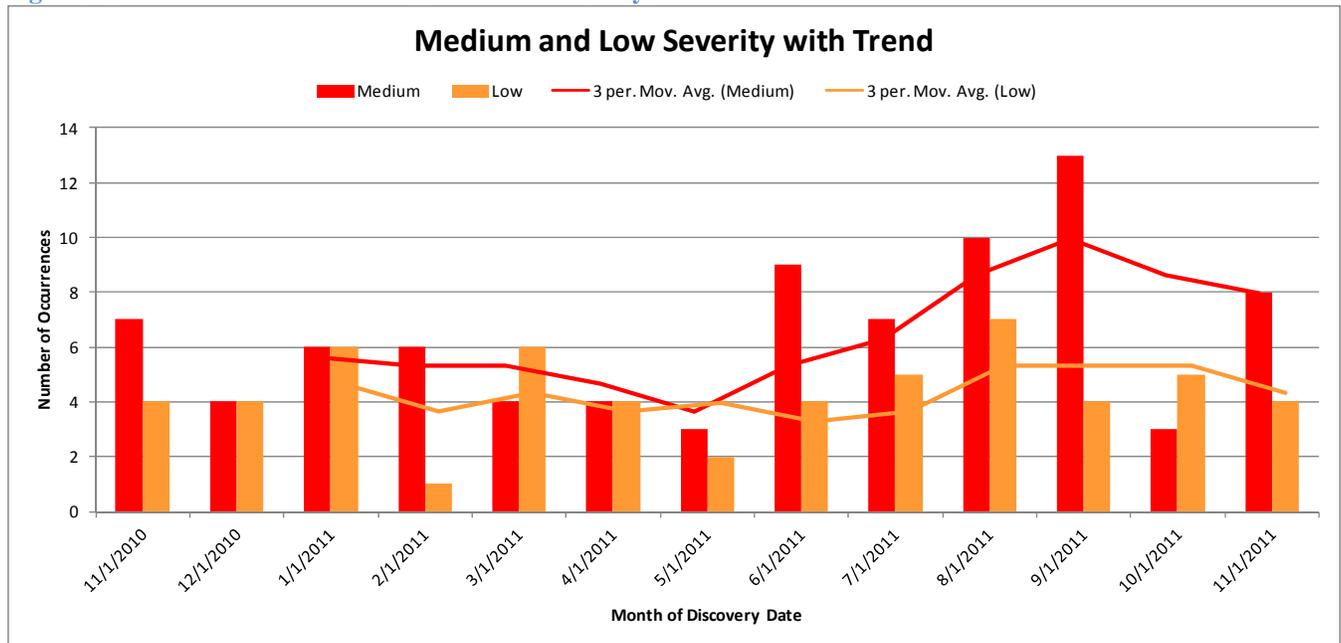


What can be seen from the previous two charts is that the number of occurrences with High electrical severity scores has remained at zero for the past six months and that the number of occurrences with Medium scores, following a drop in October, have increased above the number of Low severity occurrences.

Medium and Low Severity with Trend

Figure 8 focuses on the Medium and Low severity data series for November 2010 through November 2011. Trend lines are included for each, using a 3-month moving average.

Figure 8 - Trend of Medium and Low Electrical Severity Occurrences



The 3-month moving average shows a decreasing trend in the Medium severity occurrences following the peak in September 2011. However, the number of electrical occurrences with Medium severity scores has started to increase in the last quarter of the year. The figure also shows a leveling off of Low severity occurrences.

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

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Attachment 1

Electrical Safety Occurrences – November 2011

No	Report Number	Event Summary	SHOCK	BURN	ARCF ⁽¹⁾	LOTO ⁽²⁾	PLAN ⁽³⁾	EXCAV ⁽⁴⁾	CUT/D ⁽⁵⁾	VEH ⁽⁶⁾	SC ⁽⁷⁾	RC ⁽⁸⁾	ES ⁽⁹⁾
1	EM-ID--ITG-AMWTF-2011-0017	Landlord technician receives mild 120/208V shock due to broken molded plastic insulator on.	X								2	2C(1)	330
2	FE--NETL-GOPE-NETLMGN-2011-0005	Concrete saw severs a de-energized 277V electric line while repairing a parking garage.							X		4	10(3)	800
3	FE--NETL-GOPE-NETLPIT-2011-0005	Backhoe severs a de-energized 480V electric line while digging a natural gas line trench.						X			4	10(3)	800
4	NA--LSO-GOAK-LSO-2011-0001	Mild electrical shock while setting up computer terminal.	X								2	2C(1)	330
5	NA--LSO-GOAK-LSO-2011-0002	A subcontractor shut off an electrical breaker without doing the required LOTO.				X					3	2C(2)	0
6	NE-ID--BEA-ATR-2011-0019	Inadequate boundary used for restricting access to exposed 208V electrical source.					X				3	2C(2)	20
7	NE-ID--BEA-STC-2011-0007	Subcontractor hits conduit containing de-energized 480V conductors with an auger.				X		X			3	2C(2)	800
8	SC--ASO-ANLE-ANLEAPS-2011-0003	Worker receives minor shock from overhead light fixture supplied from 277V source.	X								2	2C(1)	1650
9	SC--ASO-ANLE-ANLEFMS-2011-0017	Subcontractor excavator struck buried conduit containing non-energized 277V lighting circuit.						X			4	10(3)	0
10	SC--BHSO-BNL-BNL-2011-0030	Employee receives a 120V shock from a light switch that was not properly bonded.	X								2	2C(1)	330

Attachment 1

No	Report Number	Event Summary	SHOCK	BURN	ARCF ⁽¹⁾	LOTO ⁽²⁾	PLAN ⁽³⁾	EXCAV ⁽⁴⁾	CUT/D ⁽⁵⁾	VEH ⁽⁶⁾	SC ⁽⁷⁾	RC ⁽⁸⁾	ES ⁽⁹⁾
11	SC--BHSO-BNL-BNL-2011-0031	A contract worker drove a screw into a metallic sheathed "BX" cable causing the 277V energized conductor shorting it to the grounded sheath.							X		3	2C(2)	550
12	SC--TJSO-JSA-TJNAF-2011-0014	An operator reset a shunt to a power supply with a paper clip instead of a non-conductive tool.									3	10(3)	20
	TOTAL		4	0	0	2	1	3	2	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 ≥ 1750 , Medium is 31-1749, and Low is 1-30

Attachment 1

Electrical Safety Occurrences – November 2011

No	Report Number	Event Summary	EW ⁽¹⁾	N-EW ⁽²⁾	SUB ⁽³⁾	HFW ⁽⁴⁾	WFH ⁽⁵⁾	PPE ⁽⁶⁾	70E ⁽⁷⁾	VOLT ⁽⁸⁾		C/I ⁽⁹⁾	NEUT ⁽¹⁰⁾	NM ⁽¹¹⁾
										H	L			
1	EM-ID--ITG-AMWTF-2011-0017	Landlord technician receives mild 120/208V shock due to broken molded plastic insulator.		X		X					X			
2	FE--NETL-GOPE-NETLMGN-2011-0005	Concrete saw severs a de-energized 277V electric line while repairing a parking garage.		X		X					X			X
3	FE--NETL-GOPE-NETLPIT-2011-0005	Backhoe severs a de-energized 480V electric line while digging a natural gas line trench.		X	X	X					X			X
4	NA--LSO-GOAK-LSO-2011-0001	Mild electrical shock while setting up computer terminal.		X		X					X			
5	NA--LSO-GOAK-LSO-2011-0002	A subcontractor shut off an electrical breaker without doing the required LOTO.	X		X		X				X			
6	NE-ID--BEA-ATR-2011-0019	Inadequate boundary used for restricting access to exposed 208V electrical source.	X				X		X		X			
7	NE-ID--BEA-STC-2011-0007	Subcontractor hits conduit containing de-energized 480V conductors with an auger.		X	X	X					X			
8	SC--ASO-ANLE-ANLEAPS-2011-0003	Worker receives minor shock from overhead light fixture supplied from 277V source.		X		X					X			
9	SC--ASO-ANLE-ANLEFMS-2011-0017	Subcontractor excavator struck buried conduit containing non-energized 277V lighting circuit.		X	X	X					X			X
10	SC--BHSO-BNL-BNL-2011-0030	Employee receives a 120V shock from a light switch that was not properly bonded.		X		X					X			

Attachment 1

No	Report Number	Event Summary	EW ⁽¹⁾	N-EW ⁽²⁾	SUB ⁽³⁾	HFW ⁽⁴⁾	WFH ⁽⁵⁾	PPE ⁽⁶⁾	70E ⁽⁷⁾	VOLT ⁽⁸⁾		C/I ⁽⁹⁾	NEUT ⁽¹⁰⁾	NM ⁽¹¹⁾
										H	L			
11	SC--BHSO-BNL-BNL-2011-0031	A contract worker drove a screw into a metallic sheathed "BX" cable causing the 277V energized conductor shorting it to the grounded sheath.		X	X	X					X			X
12	SC--TJSO-JSA-TJNAF-2011-0014	An operator reset a shunt to a power supply with a paper clip instead of a non-conductive tool.		X				X	X		X			X
	TOTAL		2	10	5	9	3	1	1	0	12	0	0	5

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 55473 OR(s) with 58783 occurrences(s) as of 12/13/2011 3:08:18 PM
 Query selected 12 OR(s) with 12 occurrences(s) as of 12/13/2011 3:09:37 PM

Download this report in Microsoft Word format. 

1)Report Number: [EM-ID--ITG-AMWTF-2011-0017](#) **After 2003 Redesign**
Secretarial Office: Environmental Management
Lab/Site/Org: Idaho National Laboratory
Facility Name: ADVANCED MIXED WASTE TREATMENT FAC
Subject/Title: Landlord Technician Receives Mild Shock Due To Broken Molded Plastic Insulator While Assembling Cubicle Wall Panels At Off-Site Facility
Date/Time Discovered: 11/27/2011 11:20 (MTZ)
Date/Time Categorized: 11/27/2011 11:58 (MTZ)
Report Type: Notification

Report Dates:

Notification	11/29/2011	16:04 (ETZ)
Initial Update		
Latest Update		
Final		

Significance Category: 2
Reporting Criteria: 2C(1) - Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or disturbance of a previously unknown or mislocated hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas) resulting in a person contacting (burn, shock, etc.) hazardous energy.

Cause Codes:
ISM:
Subcontractor Involved: No
Occurrence Description: A Landlord Technician (LT) assembling cubicle panel walls at the Energy Drive Facility (EDF) in Idaho Falls, ID, received a mild electrical shock to his right hand when he inadvertently brushed his fingers against energized electrical conductors that were exposed by a broken molded plastic insulator falling off of the electrical power wiring system on the bottom of the cubicle wall panel he was installing.

Cubicle wall panels have a manufactured wiring system in the bottom of the panel. The wiring system is manufactured by HAWORTH (catalog #PBPDA1, models RKP-B & VEKP) and is designed with molded plastic

insulated bayonet type connectors that are finger safe by design. The panel wiring systems can have electrical outlets installed on them and can be connected together using plug in type (female part of the bayonet connector) molded jumpers to route power to other cubicle panel wiring systems. The cubicle panel wiring systems are designed such that the interpanel connectors can be installed from either side of the panel.

The cubicle walls in the 100 and 500 wings of the EDF had been disassembled to allow carpet replacement in these areas.

On 11/23/2011 a LT was reassembling the cubicle walls at the EDF. The LT did not inspect the cubicle wall panel electrical wiring system prior assembling the panels. At about 1645 the LT was connecting the electrical power wiring system between cubicle wall panels when he felt a 'tingle' in the fingers of his right hand. The LT pulled his hand back from the panel and told a nearby co-worker (CW) that he thought he may have received a shock while trying to connect the cubicle wall panels together using the molded jumper designed for this connection. The CW and LT went around to the other side of the cubicle panel and noticed that the electrical connector on the opposite side of the panel from where the LT was attempting to plug in the molded jumper had exposed electrical conductors. The CW and LT noticed a molded plastic piece on the floor near the panel that appeared to be a 'cover' for the electrical connector. The CW and LT thought the piece had just popped off of the connector when the cubicle wall panel was being moved into position for assembly. In actuality the plastic piece had broken off of the connector. The LT went to notify someone of the 'cover' piece being off of the connector and the 'tingle' he had felt in his right hand. The LT did not find anyone at EDF he thought he could report the event to. While the LT was looking for someone to report the event to, the CW picked up the plastic 'cover' piece and placed it back onto the electrical connector to cover the exposed electrical conductors. The LT finished installing the cubicle panels without incident.

On 11/26/2011 the LT went to EDF and sent an e-mail to his acting supervisor at 1726 to notify the supervisor that the LT had 'felt some low voltage' while hooking up the power strips on a cubicle panel. The LT did not include a time or date when this occurred. The supervisor attempted to contact the LT for more details, to no avail, and then notified the on-duty Plant Shift Manager (PSM) by phone at 1836 that evening. The PSM notified the duty Nuclear Facility Manager (NFM) and Deputy Plant Manager at 1915 that evening.

On 11/27/2011 the LT's supervisor continued to try to contact the LT to get more details. At 0915 two electricians were dispatched from the AMWTP site to the EDF to investigate the cubicle panels at the EDF. The

LT's supervisor was to meet the electricians at EDF to show them where the LT had been working on the cubicle panel. At about 0930 the LT contacted his supervisor and stated the event occurred on Wednesday afternoon, that he did not feel he had contacted any electrical conductors, that he could not find anyone on Wednesday to notify of the event, and LT did state that a piece had come off during assembly of the cubicle that he thought had exposed the conductors. The LT went to EDF to meet the electricians to identify the panel.

Upon initial observation of the cubicle panel electrical connector the electricians could not see any deficiencies. The broken plastic piece was being held in place by the molded jumper the LT had installed to power up the next cubicle panel wiring system. With appropriate electrical PPE an electrician attempted to remove the molded jumper to inspect the connection. The broken plastic piece came off with the molded jumper exposing the electrical conductors of the cubicle panel wiring system connector. The electrician checked the connectors for voltage and discovered 120/208 VAC on the conductors. The electricians barriered off the area, stepped back, and notified the LT's supervisor, the PSM, and NFM of their discovery.

After reporting their findings, the electricians using appropriate PPE disconnected all molded jumpers to deenergize the damaged cubicle panel wiring system, removed the cubicle panel from service, and removed the panel wiring system from the panel so it could no longer be used.

Additionally the Deputy Plant Manager suspended all reconfiguration/assembly work of cubicle wall panels at the EDF until after the Fact Finding was conducted and any corrective actions are put into place.

Based on the report of the exposed energized electrical conductors and the statement from the LT that he had not touched anything when he felt the 'tingle' in his hand, the NFM initially categorized the event as ORPS reportable as 2C(2)3 Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or a site condition that results in the unexpected discovery of an uncontrolled hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas). This criterion does not include discoveries made by zero-energy checks and other precautionary investigations made before work is authorized to begin.

During the Fact Finding conducted on 11/28/2011 it became apparent that the LT had most likely slipped his hand under the cubicle wall while attempting to plug in the molded jumper and brushed his fingers on the exposed conductors on the opposite side of the cubicle wall connection he was trying to plug in. This most likely caused the 'tingling' the LT felt.

Based on this information the event was recategorized at 1425 as 2C(1)2 Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or disturbance of a previously unknown or mislocated hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas) resulting in a person contacting (burn, shock, etc.) hazardous energy.

Additional facts determined at the fact finding:

1. The work being performed to assemble the cubicle wall panels is considered administrative exempt work with no specific work control requirements needed to perform the work.
2. The LT stated he had not received any recent training on what to look for when assembling the cubicle panels, or on installing the panels.
3. Movement of cubicle walls is infrequent evolution.
4. Medical personnel (site nurse) determined medical evaluation of the LT was not needed due to time from event occurrence to when the event was reported and investigated.

Corrective actions identified by the Fact Finding to be completed prior to resuming cubicle wall assembly:

1. All cubicle wall electrical wiring systems at the EDF in the 100 & 500 wings will be inspected by electricians for damaged connectors.
2. Perform training for LT's on inspection and assembly of cubicle wall panels.
3. Issue a Project Note for general employee awareness of electrical safety and reporting responsibility.

Cause Description:

Operating Conditions: Well lighted office area.

Activity Category: Maintenance

Immediate Action(s): Electricians deenergized and removed the cubicle panel with broken electrical connectors from service.
Cubicle reconfiguration work/assembly was suspended by the Deputy Plant Manager.

FM Evaluation:

DOE Facility Representative

Input:

DOE Program Manager

Input:

Further Evaluation is Required: No

Division or Project: AMWTP

Plant Area: Off-Site Offices

System/Building/Equipment: Cubicle PNL1 series wiring system Mdl RKP-B & VEKP

Facility Function: Nuclear Waste Operations/Disposal

Corrective Action:

Lessons(s) Learned:

HQ Keywords: 01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous)
 01F--Inadequate Conduct of Operations - Training Deficiency
 07D--Electrical Systems - Electrical Wiring
 08A--OSHA Reportable/Industrial Hygiene - Electrical Shock
 12C--EH Categories - Electrical Safety
 14B--Quality Assurance - Training and Qualification Deficiency
 14E--Quality Assurance - Work Process Deficiency

HQ Summary: On November 23, 2011, a Landlord Technician (LT), who was assembling cubicle panel walls at the Energy Drive Facility in Idaho Falls, ID, received a mild electrical shock to his right hand when he inadvertently brushed his fingers against energized electrical conductors that were exposed by a broken molded plastic connector falling off of the electrical power wiring system on the bottom of the cubicle wall panel that he was installing. The LT pulled his hand back from the panel and told a nearby co-worker that he thought he may have received a shock. They went around to the other side of the cubicle panel and noticed that an electrical connector on the opposite side of the panel had exposed electrical conductors. During the Fact Finding on November 28, it became apparent that the LT had most likely slipped his hand under the cubicle wall while attempting to plug in the molded jumper and brushed his fingers on the exposed conductors on the opposite side of the cubicle wall connection he was trying to plug in. The LT did not inspect the cubicle wall panel electrical wiring system before assembling the panels. Electricians de-energized and removed the cubicle panel with the broken electrical connector from service. Cubicle reconfiguration work/assembly was suspended by the Deputy Plant Manager.

Similar OR Report Number:

Facility Manager:

Name	WARNER, BRIAN D
Phone	(208) 557-6318
Title	Back-up Nuclear Facility Manager

Originator:

Name	WARNER, BRIAN D
Phone	(208) 557-7181
Title	SHIFT MANAGER

HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:

Date	Time	Person Notified	Organization
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11/27/2011	12:09 (MTZ)	Steve Karns	DOE_ID
11/28/2011	14:25 (MTZ)	Mike Goriup	DOE_ID

Authorized Classifier(AC):

2)Report Number: [FE--NETL-GOPE-NETLMGN-2011-0005](#) After 2003 Redesign
Secretarial Office: Fossil Energy
Lab/Site/Org: National Energy Technology Laboratory
Facility Name: NETL - Morgantown
Subject/Title: Concrete Saw Severs a 277 Volt Electric Line While Making Repairs to Parking Garage
Date/Time Discovered: 11/16/2011 08:30 (ETZ)
Date/Time Categorized: 11/16/2011 09:30 (ETZ)
Report Type: Notification/Final
Report Dates:

Notification	11/20/2011	13:02 (ETZ)
Initial Update	11/20/2011	13:02 (ETZ)
Latest Update	11/20/2011	13:02 (ETZ)
Final	11/20/2011	13:02 (ETZ)

Significance Category: 4
Reporting Criteria: 10(3) - A near miss, where no barrier or only one barrier prevented an event from having a reportable consequence. One of the four significance categories should be assigned to the near miss, based on an evaluation of the potential risks and the corrective actions taken. (1 of 4 criteria - This is a SC 4 occurrence)

Cause Codes: A4B3C08 - Management Problem; Work Organization & Planning LTA; Job scoping did not identify special circumstances and/or conditions

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

Subcontractor Involved: No

Occurrence Description: On November 15, 2011, a construction contractor performed a series of concrete cuts on the top level (5) of the site parking garage and on the next level (4) down to facilitate the removal of defective concrete and prepare for the installation of new catch basins. The catch basin and the defective concrete on the upper level of the garage were replaced later that day. The following working day on November 16, while the construction contractors were removing the defective concrete on level 4 of the parking garage, it was discovered that a conduit encased in the poured concrete had been cut by the concrete saw on the previous day. The conduit carried conductors that supply 277 volt AC power (20 amps) to pole lights on the upper level of the parking garage. The circuit was de-energized at time the

circuit was cut and when the cut was discovered. The lighting circuit that was cut is controlled by a photo-cell that turns the lights off during the day and on at night. At the time the cut was made and when the damaged conduit was discovered the circuit was de-energized due to the ambient light level. However, the circuit was not controlled nor locked out while the concrete removal work was being performed.

Cause Description: The contractor was not provided a copy of any electrical drawings for the parking garage as there was no electrical system modification or maintenance planned in their statement of work. The electrical drawings for the parking garage are of a single-line/schematic nature and do not show the locations of the electrical conduits (as built).

Operating Conditions: Normal

Activity Category: Maintenance

Immediate Action(s): Concrete cutting operations were ceased and a barrier was put in place over the conduit until all information regarding the conduit was determined. The circuit was locked and tagged out and the damaged conduit and conductors were repaired.

FM Evaluation: No one was injured as a result of this incident. The contractor indicated that they had not made an effort to identify the location of the conduit as they assumed it passed through the floor deck to the next level below (just as it did on the upper level), but had not verified this was the case. The contractor was unaware that any conduit was encased in the poured concrete as it appeared that all conduits in the parking garage were surface mounted.

DOE Facility Representative

Input:

DOE Program Manager

Input:

Further Evaluation is Required: No

Division or Project: Office of Institutional Operations-Site Operations

Plant Area: 4/5 Floors

System/Building/Equipment: Parking Garage

Facility Function: Balance-of-Plant - Site/outside utilities

Corrective Action:

Lessons(s) Learned: The ESS&H Division Director requested that all current NETL activities, regardless of site, that involve subsurface utilities be stood down until such a time that it can be demonstrated, by project, that a sufficient investigation of the location of all utilities has been performed, documented, and reviewed by all parties involved.

HQ Keywords: 01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control
01N--Inadequate Conduct of Operations - Inadequate Job Planning (Other)

- 07D--Electrical Systems - Electrical Wiring
- 08F--OSHA Reportable/Industrial Hygiene - Industrial Operations Issues
- 08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical)
- 12K--EH Categories - Near Miss (Could have been a serious injury or fatality)
- 14D--Quality Assurance - Documents and Records Deficiency
- 14E--Quality Assurance - Work Process Deficiency

HQ Summary:

On November 15, 2011, a construction contractor cut a conduit, which carried conductors that supply 277 volt AC power (20 amps) to pole lights on the upper level of the parking garage. Concrete cuts were made on the top level (5) of the site parking garage and on the next level (4) down to facilitate the removal of defective concrete and prepare for the installation of new catch basins. The following day, while the construction contractors were removing the defective concrete on level 4 of the parking garage, it was discovered that a conduit encased in the poured concrete had been cut by the concrete saw on the previous day. The circuit was de-energized at the time the circuit was cut and when the cut was discovered. The lighting circuit that was cut is controlled by a photo-cell that turns the lights off during the day and on at night. At the time the cut was made and when the damaged conduit was discovered, the circuit was de-energized due to the ambient light level. However, the circuit was not controlled nor locked out while the concrete removal work was being performed. The contractor was not provided a copy of any electrical drawings for the parking garage as there was no electrical system modification or maintenance planned in their statement of work. The electrical drawings for the parking garage are of a single-line/schematic nature and do not show the locations of the electrical conduits (as built). No one was injured as a result of this incident.

Similar OR Report Number:

Facility Manager:

Name	BUTERBAUGH, JEFFERY L.
Phone	(304) 285-4214
Title	EMERGENCY RESPONSE COORDINATOR

Originator:

Name	BUTERBAUGH, JEFFERY L.
Phone	(304) 285-4214
Title	EMERGENCY RESPONSE COORDINATOR

HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:

Date	Time	Person Notified	Organization
11/16/2011	09:30 (ETZ)	Mike Monahan	NETL
11/16/2011	09:45 (ETZ)	Bill Lowry	NETL

11/17/2011	11:30 (ETZ)	Tom Wilson	NETL
11/17/2011	12:34 (ETZ)	Brad Tomer	NETL
11/17/2011	12:34 (ETZ)	Bob Reuther	NETL
11/17/2011	12:34 (ETZ)	Anthony Cugini	NETL
11/17/2011	12:34 (ETZ)	Scott Klara	NETL

Authorized Classifier(AC):

3)Report Number: [FE--NETL-GOPE-NETLPIT-2011-0005](#) **After 2003 Redesign**
Secretarial Office: Fossil Energy
Lab/Site/Org: National Energy Technology Laboratory
Facility Name: NETL - Pittsburgh
Subject/Title: Backhoe Severs a 480 Volt Electric Line While Digging a Natural Gas Line Trench
Date/Time Discovered: 11/16/2011 14:00 (ETZ)
Date/Time Categorized: 11/17/2011 09:30 (ETZ)
Report Type: Notification/Final
Report Dates:

Notification	11/18/2011	17:54 (ETZ)
Initial Update	11/18/2011	17:54 (ETZ)
Latest Update	11/18/2011	17:54 (ETZ)
Final	11/18/2011	17:54 (ETZ)

Significance Category: 4
Reporting Criteria: 10(3) - A near miss, where no barrier or only one barrier prevented an event from having a reportable consequence. One of the four significance categories should be assigned to the near miss, based on an evaluation of the potential risks and the corrective actions taken. (1 of 4 criteria - This is a SC 4 occurrence)

Cause Codes: A4B3C08 - Management Problem; Work Organization & Planning LTA; Job scoping did not identify special circumstances and/or conditions

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

Subcontractor Involved: Yes
 Wayne Crouse Inc.

Occurrence Description: While digging a trench using a backhoe to install a new natural gas line, a construction contractor struck a buried conduit containing 480 volt wiring. The conduit was buried about 15 inches deep with a red warning tape laid above it; however, the warning tape was contacted at the same time the conduit was severed. The conduit was later determined to be providing electrical power to area street lights. The electric line was not energized at

the time of the incident because it was daylight and the system photo-sensor was not activated.

Cause Description: An NETL digging permit had been obtained several months prior to construction operations and no utility lines were identified based on site drawings. The digging was in an area where a building was previously demolished. At some time before the event, another construction contractor, installed the underground electric line, but the updated information had not been entered onto the site drawing. An appropriate detection device was not used to verify that any utility lines were present.

Operating Conditions: Normal

Activity Category: Construction

Immediate Action(s): Trenching operations were ceased until all information regarding the conduit was determined.

FM Evaluation: No one was injured as a result of this incident.

DOE Facility Representative

Input:

DOE Program Manager

Input:

Further Evaluation is Required: No

Division or Project: Office of Institutional Operations-Site Operations

Plant Area: Construction Area

System/Building/Equipment: Building 900

Facility Function: Balance-of-Plant - Site/outside utilities

Corrective Action:

Lessons(s) Learned: The ESS&H Division Director requested that all current NETL activities, regardless of site, that involve excavation be stood down until such a time that it can be demonstrated, by project, that a sufficient investigation of subsurface utilities has been performed, documented, and reviewed by all parties involved in the excavation activity.

HQ Keywords: 01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control
01N--Inadequate Conduct of Operations - Inadequate Job Planning (Other)
07D--Electrical Systems - Electrical Wiring
08F--OSHA Reportable/Industrial Hygiene - Industrial Operations Issues
08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical)
11G--Other - Subcontractor
12K--EH Categories - Near Miss (Could have been a serious injury or fatality)
14D--Quality Assurance - Documents and Records Deficiency
14E--Quality Assurance - Work Process Deficiency
14G--Quality Assurance - Procurement Deficiency

HQ Summary: On November 16, 2011, while digging a trench using a backhoe to install a

new natural gas line, a construction contractor struck a buried conduit containing 480 volt wiring. The conduit was buried about 15 inches deep with a red warning tape laid above it; however, the warning tape was contacted at the same time the conduit was severed. The conduit was later determined to be providing electrical power to area street lights. The electric line was not energized at the time of the incident because it was daylight and the system photo-sensor was not activated. A National Energy Technology Laboratory digging permit had been obtained several months prior to construction operations and no utility lines were identified based on site drawings. An appropriate detection device was not used to verify that any utility lines were present. The digging was in an area where a building was previously demolished. At some time before the event, another construction contractor, installed the underground electric line, but the updated information had not been entered onto the site drawing. Trenching operations were ceased until all information regarding the conduit was determined. No one was injured as a result of this incident.

Similar OR Report Number: 1. FE--NETL-GOPE-NETLMGN-2008-001

Facility Manager:

Name	BUTERBAUGH, JEFFERY L.
Phone	(304) 285-4214
Title	EMERGENCY RESPONSE COORDINATOR

Originator:

Name	BUTERBAUGH, JEFFERY L.
Phone	(304) 285-4214
Title	EMERGENCY RESPONSE COORDINATOR

HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:

Date	Time	Person Notified	Organization
11/16/2011	14:15 (ETZ)	ELI George	NETL
11/16/2011	14:30 (ETZ)	Mike Monahan	NETL
11/16/2011	14:45 (ETZ)	Bill Lowry	NETL
11/17/2011	12:34 (ETZ)	Brad Tomer	NETL
11/17/2011	12:34 (ETZ)	Scott Klara	NETL
11/17/2011	12:34 (ETZ)	Bob Reuther	NETL
11/17/2011	12:34 (ETZ)	Anthony Cugini	NETL
11/17/2011	12:34 (ETZ)	Tom Wilson	NETL

Authorized Classifier(AC):

4)Report Number:

[NA--LSO-GOAK-LSO-2011-0001](#) After 2003 Redesign

Secretarial Office:

National Nuclear Security Administration

Lab/Site/Org: Lawrence Livermore National Lab.
Facility Name: Livermore Site Office
Subject/Title: Mild Electrical Shock While Setting up Computer Terminal
Date/Time Discovered: 11/17/2011 08:50 (PTZ)
Date/Time Categorized: 11/17/2011 14:15 (PTZ)
Report Type: Notification
Report Dates:

Notification	11/21/2011	13:37 (ETZ)
Initial Update		
Latest Update		
Final		

Significance Category: 2
Reporting Criteria: 2C(1) - Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or disturbance of a previously unknown or mislocated hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas) resulting in a person contacting (burn, shock, etc.) hazardous energy.

Cause Codes:
ISM: 4) Perform Work Within Controls
Subcontractor Involved: No

Occurrence Description: On the morning of October 18, 2011, in Building 311, Room 1100, an employee experienced a mild shock when making connections from the computer and monitor to a power cord located beneath the workstation. The Safeguards and Security employee present reported the event to the Building Coordinator. No additional actions were taken at this time.

On November 17, 2011, the Occurrence Reporting Manager was made aware of the event and notified Management. Follow up actions are being initiated by the Operations Team Lead and appropriate Subject Matter Experts.

Cause Description:
Operating Conditions: Normal
Activity Category: Normal Operations (other than Activities specifically listed in this Category)
Immediate Action(s): On October 18, 2011, the Building Coordinator was notified.
FM Evaluation:
DOE Facility Representative Input:
DOE Program Manager Input:

Further Evaluation is Required: Yes.
 Before Further Operation? No
 By Whom: Richard Scott
 By When:

Division or Project: NNSA/LSO

Plant Area: Site 200

System/Building/Equipment: B311 Room 1100

Facility Function: Balance-of-Plant - Offices

Corrective Action:

Lessons(s) Learned:

HQ Keywords: 01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous)
 01P--Inadequate Conduct of Operations - Inadequate Oral Communication
 08A--OSHA Reportable/Industrial Hygiene - Electrical Shock
 12C--EH Categories - Electrical Safety
 14E--Quality Assurance - Work Process Deficiency

HQ Summary: On October 18, 2011, in Building 311, Room 1100, an employee experienced a mild shock when making connections from the computer and monitor to a power cord located beneath the workstation. The Safeguards and Security employee present reported the event to the Building Coordinator. No additional actions were taken at this time. On November 17, the Occurrence Reporting Manager was made aware of the event and notified Management. Follow up actions are being initiated by the Operations Team Lead and appropriate Subject Matter Experts.

Similar OR Report Number:

Facility Manager:

Name	HOEHNE, ANGELA R
Phone	(925) 422-3357
Title	DOE NNSA FACILITY MANAGER

Originator:

Name	HARTNETT, ADRIENNE M
Phone	(925) 424-6963
Title	PROGRAM ANALYST

HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:

Date	Time	Person Notified	Organization
11/17/2011	14:56 (PTZ)	Alice Williams	LSO
11/17/2011	14:56 (PTZ)	Phil Hill	LSO

Authorized Classifier(AC): Lois Marik Date: 11/21/2011

5)Report Number: [NA--LSO-GOAK-LSO-2011-0002](#) After 2003 Redesign

Secretarial Office: National Nuclear Security Administration
Lab/Site/Org: Lawrence Livermore National Lab.
Facility Name: Livermore Site Office
Subject/Title: Lock Out Tag Out Violation During Subcontractor Work at Building 132 South
Date/Time Discovered: 11/15/2011 08:15 (PTZ)
Date/Time Categorized: 11/17/2011 16:00 (PTZ)
Report Type: Update
Report Dates:

Notification	11/18/2011	19:38 (ETZ)
Initial Update	11/21/2011	12:31 (ETZ)
Latest Update	11/21/2011	12:31 (ETZ)
Final		

Significance Category: 3
Reporting Criteria: 2C(2) - Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or a site condition that results in the unexpected discovery of an uncontrolled hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas). 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: No
Occurrence Description: On Tuesday November 15, 2011 a subcontractor supporting work to relocate a sensor in Building 132 South, shut off an electrical breaker without doing the required LOTO steps (e.g. hanging a lock and tag as required). The subcontractor completed the sensor relocation activity and reset the breaker, without incident or injury. This was a violation of the required LOTO procedure.

This violation was discovered and reported by the Johnson Control Government Services (JCGS) inspector supporting the project.

This is a NNSA managed contract through the Albuquerque Service Center. The work is being performed at LLNL utilizing a JCGS subcontractor (i.e. Schneider Electric).

The Facilities & Infrastructure (F&I) Directorate is reporting this event per the requirements stated in LLNL document "PRO-0082 Reporting Occurrences to DOE" (LLNL-AM-440851). In section "3.4- Identify the Owning Principal Directorate"; it states that "the responsibility for initial reporting of an occurrence is assigned by the Laboratory Director to the

principal directorate owing the facility for which the event or condition occurred."

Since the F&I Directorate's Facility Management Department (FMD) retains responsibility for managing building 132 South; this notification report is being initiated by LLNL/F&I with the understanding that future responsibilities associated to this event may be transferred.

This occurrence report is being tracked in LLNL's Issues Tracking System, reference Assessment No. 33639.

Cause Description:

Operating Conditions:

Normal

Activity Category:

Construction

Immediate Action(s):

1. Notification of this event was immediately initiated from F&I to the Albuquerque Service Center representative on site.
2. The Building 132 South electrical breaker was safely returned to it normal operation. No personnel or facilities systems were affected from this event.
3. The subcontractor supporting JCGS was instructed to review LOTO requirements prior to performing any further electrical work at LLNL (under JCGS).
4. JCGS will do a review of LOTO procedures with its other sub-contractors operating at LLNL.

FM Evaluation:

Submit final occurrence to ORO by 12/21/2011.

Enter the final occurrence report into ORPS by 12/28/2011.

DOE Facility Representative

Input:

DOE Program Manager

Input:

Further Evaluation is Required:

Yes.
Before Further Operation? No
By Whom: TBD
By When:

Division or Project:

Operations and Business

Plant Area:

Site 200

System/Building/Equipment: Building 132S

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 November 15, 2011, a subcontractor supporting work to relocate a sensor in Building 132 South, shut off an electrical breaker without performing the required LOTO steps (i.e. hanging a lock and tag, as required). The subcontractor completed the sensor relocation activity and reset the breaker, without incident or injury. This was a violation of the required LOTO procedure. This violation was discovered and reported by the Johnson Control Government Services (JCGS) inspector supporting the project. This is a National Nuclear Security Administration managed contract through the Albuquerque Service Center. The work is being performed at Lawrence Livermore National Laboratory utilizing a JCGS subcontractor (i.e. Schneider Electric).

Similar OR Report Number:

Facility Manager:

Name	Harold T. Conner, Jr.
Phone	(925) 422-5786
Title	Associate Director, Facilities & Infrastructure

Originator:

Name	LUDWIG, MARK E.
Phone	(925) 422-6964
Title	OCCURRENCE REPORTING OFFICER

HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:

Date	Time	Person Notified	Organization
11/17/2011	16:15 (PTZ)	Roger Rocha	LEDO
11/17/2011	16:22 (PTZ)	Tracey Simpson	ESH TL
11/17/2011	16:28 (PTZ)	Lois Marik	NNSA LSO

Authorized Classifier(AC): Kevin Akey Date: 11/18/2011

6)Report Number:

[NE-ID--BEA-ATR-2011-0019](#) After 2003 Redesign

Secretarial Office:

Nuclear Energy, Science and Technology

Lab/Site/Org:

Idaho National Laboratory

Facility Name:

Advanced Test Reactor

Subject/Title:

Inadequate Boundary Prohibiting Access to Potential Electrical Hazard at the Advanced Test Reactor (ATR)

Date/Time Discovered:

11/28/2011 14:00 (MTZ)

Date/Time Categorized:

12/01/2011 11:26 (MTZ)

Report Type: Notification

Report Dates:

Notification	12/05/2011	17:57 (ETZ)
Initial Update		
Latest Update		
Final		

Significance Category: 3

Reporting Criteria: 2C(2) - Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or a site condition that results in the unexpected discovery of an uncontrolled hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas). 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: No

Occurrence Description: At approximately 1400 on November 28, 2011, the ATR Department of Energy (DOE) Facility Representative (FR) informed ATR facility management that he had observed a potentially inadequate boundary rope/signage used for restricting access to a hazardous energy source (exposed 208 VAC electrical). ATR facility management responded to the second basement area to investigate. It was identified that the cover to the load bank disconnect had been removed and the load bank cables were connected to conduct a rundown of the utility battery in accordance with an existing work order. The rope boundary was approximately 8 inches from the exposed conductor at its closest point. The limited approach boundary is 3 feet 6 inches in accordance with NFPA-70E. As such, the boundary was insufficient to prevent entry of an unqualified person inside the limited approach boundary.

This event was originally categorized as not reportable. After further investigation and discussion, it was determined that this issue did meet reporting criteria; therefore, the two hour categorization requirement was not met.

Cause Description:

Operating Conditions: The ATR was shut down for the Cycle 151A-1 outage.

Activity Category: Maintenance

Immediate Action(s): Appropriate levels of BEA management were notified of this event.

The boundary rope was relocated to ensure the limited approach boundary was within the rope barrier.

FM Evaluation:

DOE Facility Representative

Input:

DOE Program Manager

Input:

Further Evaluation is Required: No

Division or Project: ATR Programs

Plant Area: Second Basement

System/Building/Equipment: TRA-670, Second Basement

Facility Function: Category "A" Reactors

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)
 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 November 28, 2011, the Advanced Test Reactor (ATR) Department of Energy Facility Representative informed ATR facility management that he had observed a potentially inadequate boundary rope/signage used for restricting access to a hazardous energy source (exposed 208 VAC electrical). ATR facility management responded to the second basement area to investigate. It was identified that the cover to the load bank disconnect had been removed and the load bank cables were connected to conduct a rundown of the utility battery in accordance with an existing work order. The rope boundary was approximately 8 inches from the exposed conductor at its closest point versus the limited approach boundary of 3 feet 6 inches in accordance with National Fire Protection Association-70E. As such, the boundary was insufficient to prevent entry of an unqualified person inside the limited approach boundary. Appropriate levels of Battelle Energy Alliance management were notified of this event. The boundary rope was relocated to ensure the limited approach boundary was within the rope barrier.

Similar OR Report Number:

Facility Manager:

Name	SCHUEBERT, EDMOND J
Phone	(208) 533-4246
Title	ATR Operations Facility Manager

Originator:

Name	OWENS, MARJORIE A
Phone	(208) 533-4563
Title	ATR OPERATIONS FACILITY ADMINISTRATI

HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:

Date	Time	Person Notified	Organization
12/01/2011	11:26 (MTZ)	R. Denning	DOE-ID

Authorized Classifier(AC): Caleb Robison Date: 12/05/2011

7)Report Number:

[NE-ID--BEA-STC-2011-0007](#) After 2003 Redesign

Secretarial Office:

Nuclear Energy, Science and Technology

Lab/Site/Org:

Idaho National Laboratory

Facility Name:

Science and Technology Campus

Subject/Title:

Service Subcontractor Contacts De-energized Conduit at the INL Blackfoot Bus Lot

Date/Time Discovered:

11/13/2011 13:30 (MTZ)

Date/Time Categorized:

11/13/2011 15:00 (MTZ)

Report Type:

Update

Report Dates:

Notification	11/15/2011	08:48 (ETZ)
Initial Update	12/01/2011	10:45 (ETZ)
Latest Update	12/01/2011	10:45 (ETZ)
Final		

Significance Category:

3

Reporting Criteria:

2C(2) - Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or a site condition that results in the unexpected discovery of an uncontrolled hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas). 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
Steelhead Construction

Occurrence Description:

On November 13, 2011 at approximately 1230 a service subcontractor was working at the Idaho National Laboratory (INL) Blackfoot Bus Lot installing fence posts and parking barriers. During the installation of a fence post the service subcontractor contacted a de-energized conduit

containing 480 volt conductors and immediately stopped work and contacted INL management. There were no injuries to personnel as a result of this incident.

Initial investigation indicated a subsurface investigation was complete by "Dig-Line" however the subsurface investigation was only within the parameters of the main disconnect which did not include the area that the contact with the conduit was made. No other subsurface investigation was completed prior to the installation of the fence posts. The service subcontract Foreman indicated he knew there was conduit near the area where he was installing the fence post because of previous work that was completed earlier this year. He used a shovel to dig approximately 27 inches deep and found no obstructions. He then used a mechanical auger to drill the fence post hole deeper and came in contact with the conduit. The breaker controlling power to this conduit was off however it was not controlled by a Lockout/Tagout device.

Further investigation of this incident will continue.

Cause Description:

Operating Conditions: Normal

Activity Category: Construction

Immediate Action(s): Work at the Blackfoot Bus lot was stopped pending initial investigation. INL Management was notified at 1330. DOE-ID was notified of the event and initial categorization at 1500. A critique of this event was conducted on Monday 11-14-11.

FM Evaluation: On December 1, 2011 an update was submitted to change the responsible manager to Van Briggs, Manager INL Construction Services. Jim Geringer, DOE-ID notified on 12/1/2011.

DOE Facility Representative

Input:

DOE Program Manager

Input:

Further Evaluation is Required: Yes.
Before Further Operation? No
By Whom: INL Facility/Const. Mgmt
By When:

Division or Project: REC Facility Services

Plant Area: REC

System/Building/Equipment: Blackfoot Bus Lot

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)
 01N--Inadequate Conduct of Operations - Inadequate Job Planning (Other)
 07D--Electrical Systems - Electrical Wiring
 08F--OSHA Reportable/Industrial Hygiene - Industrial Operations Issues
 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 November 13, 2011, during the installation of a fence post and parking barriers at the Idaho National Laboratory (INL), a service subcontractor was working at the Blackfoot Bus Lot and contacted a de-energized conduit containing 480-volt conductors. The subcontractor immediately stopped work and contacted INL management. There were no injuries to personnel as a result of this incident. Initial investigation indicated a subsurface investigation was complete by "Dig-Line" however the subsurface investigation was only within the parameters of the main disconnect which did not include the area that the contact with the conduit was made. No other subsurface investigation was completed prior to the installation of the fence posts. The service subcontract Foreman indicated that he knew there was conduit near the area where he was installing the fence post because of previous work that was completed earlier this year. The subcontractor used a shovel to dig approximately 27 inches deep and found no obstructions. He then used a mechanical auger to drill the fence post hole deeper and came in contact with the conduit. The breaker controlling power to this conduit was off however, it was not controlled by a lockout/tagout device. Work at the Blackfoot Bus lot was stopped pending initial investigation. A critique of this event was conducted.

Similar OR Report Number:

Facility Manager:

Name	Briggs, Van W.
Phone	(208) 526-0950
Title	INL Construction Services Department Manager

Originator:

Name	LINDBERG, STEVEN
Phone	(208) 526-4007
Title	OPERATIONS MANAGER

HQ OC Notification:

Date	Time	Person Notified	Organization
12/01/2011	08:30 (MTZ)	Jim Geringer	DOE-ID

Other Notifications:

Date	Time	Person Notified	Organization
11/13/2011	13:30 (MTZ)	Steven Lindberg	BEA
11/13/2011	15:00 (MTZ)	Jim Geringer	DOE-ID

Authorized Classifier(AC): Jeffrey Garner **Date:** 11/14/2011

8)Report Number: [SC--ASO-ANLE-ANLEAPS-2011-0003](#) **After 2003 Redesign**
Secretarial Office: Science
Lab/Site/Org: Argonne National Laboratory East
Facility Name: Advanced Photon Source
Subject/Title: Worker Reports Receiving Minor Shock From Overhead Light Fixture
Date/Time Discovered: 11/17/2011 09:30 (CTZ)
Date/Time Categorized: 11/17/2011 11:00 (CTZ)
Report Type: Notification

Report Dates:

Notification	11/18/2011	17:44 (ETZ)
Initial Update		
Latest Update		
Final		

Significance Category: 2
Reporting Criteria: 2C(1) - Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or disturbance of a previously unknown or mislocated hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas) resulting in a person contacting (burn, shock, etc.) hazardous energy.

Cause Codes:

ISM:

Subcontractor Involved: No

Occurrence Description: On November 16, 2011, at approximately 1830 CST, two Advanced Photon Source (APS) workers were pulling non-energized computer network cables above a suspended ceiling in a conference room when one worker felt a tingling sensation in an arm touching the ceiling tile grid. The workers were engaged in non-electrical work which did not require a LOTO. The two workers (A & B) were working inside a 12 foot by 28 foot conference room. The computer network cables were being run along the long length of the room. They were using ladders to reach the ceiling tile, lift the tile off of the grid supporting it in place, and setting the tile to the side above the grid. They then climbed high enough to reach the end of the non-energized computer network cables they were pulling and to pull these cables across the space and far enough to the next side to reach from another ceiling tile further down the room. They would then climb down the ladders being used, reposition the ladders, and repeat these actions. When they were nearly done pulling the cables above the ceiling, one worker (Worker A) felt a tingling sensation in his arm where it was touching the ceiling tile grid. Worker A told the other worker (Worker B) that he may have been shocked and to stop working. Worker A (who is a

qualified electrical worker) then climbed down the ladder, got a Fluke Model 179 multimeter from his tool kit, and climbed back up the ladder. Worker A took three measurements. The first measurement was between a rivet on the light fixture housing nearest him and the ceiling tile grid where his arm had been resting. This measurement showed a voltage difference of 100 V. Worker A then moved the meter lead from the rivet to the flexible cable feeding the fixture and only a few millivolts difference were measured (it was the same reading as when the meter leads were not connected to anything). Worker A then moved the lead to a rivet in the housing of an adjacent light fixture and measured a voltage difference of 104 V. At this point he declared they would stop all further work, he replaced the ceiling tile, the ladders were secured, and they left the area.

The work being performed was not electrical work and no electrical hazard was expected to be encountered. Both workers were wearing safety glasses and leather gloves for the task. Worker A was wearing a cotton short sleeved shirt. Neither worker thought to call 911 and the incident was not reported until the following morning.

When Worker A came into work the morning of November 17, 2011, he held several discussions with staff members prior to reporting the incident to the designated ORPS facility manager. Two other APS Engineering Support (AES) staff members, an electrical engineer and the divisional Environment, Safety and Health (ESH) coordinator, were with Worker A when he came to the designated ORPS facility manager's office to report the incident. The ORPS facility manager directed Worker A to report to the medical department for an examination and asked the other two AES staff members to contact Facilities Management and Services-Building Maintenance (FMS-BS) to troubleshoot the lighting circuit. Worker A's medical examination found no evidence of damage occurring from the electric shock he received. The source of the shock and voltage measured by Worker A could not be determined by the initial FMS-BM troubleshooting efforts. Even Worker A could not measure any voltage differences when testing the same points she had measured the previous evening. However, a source associated with the grounding connection to the light fixtures was located during additional investigations conducted on the morning of November 18, 2011. The manufacturer has been contacted to obtain detailed information regarding installation instructions and once this information is obtained, further investigation will be performed to more definitively pinpoint what is causing the inadequate grounding which has been found.

Based on the shock having originated from the lighting circuit, the electrical severity has been calculated to be 3150 high.

Cause Description:

Operating Conditions:

Normal operations

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

Immediate Action(s): An initial informal fact finding meeting was held to determine the basics facts of the event. Following this Worker A was directed to report to the Argonne medical department for an examination. No evidence of damage from the shock event was found.

The lighting circuit was locked out until troubleshooting could be conducted and again after the initial troubleshooting did not find the source of the shock. While the lighting circuit was de-energized, the computer network cable was pulled the short amount that remained so no further work for this task needed to be conducted above the ceiling.

As the initial troubleshooting failed to locate a source for the shock, the APS electrical safety committee chair was contacted and requested to form a subcommittee to perform additional measurements and physical examination of the light fixtures. These actions were performed on the morning of November 18, 2011 and a source for the shock and subsequently measured voltages was identified. As the source is localized to the light fixtures, it was decided to leave the lighting circuit energized and to permit use of the conference room. However, no work on the light fixtures or at or above the ceiling level is being permitted pending further investigation.

The manufacturer of the light fixtures has been contacted to obtain additional information and further investigation will occur once that information is received.

FM Evaluation: At the time of preparation of this initial notification report, it had not been determined if the grounding problem found with the light fixture was due to how it was installed or to how the fixture grounding was designed or fabricated. The lighting fixture has a UL label.

DOE Facility Representative Input:

DOE Program Manager Input:

Further Evaluation is Required: Yes.
Before Further Operation? No
By Whom: ORPS facility manager
By When:

Division or Project: APS Engineering Support Division (AES)

Plant Area: Bldg 401 Room A1209A

System/Building/Equipment: Electrical/401/Lighting

Facility Function: Accelerators

Corrective Action:

Lessons(s) Learned:

HQ Keywords:

01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous)
 01P--Inadequate Conduct of Operations - Inadequate Oral Communication
 08A--OSHA Reportable/Industrial Hygiene - Electrical Shock
 12C--EH Categories - Electrical Safety
 14E--Quality Assurance - Work Process Deficiency

HQ Summary:

On November 16, 2011, two Advanced Photon Source workers were pulling non-energized computer network cables above a suspended ceiling in a conference room when one worker felt a tingling sensation in an arm touching the ceiling tile grid. The workers were engaged in non-electrical work which did not require a LOTO. The two workers (A & B) were working inside a 12 foot by 28 foot conference room; the computer network cables were being run along the long length of the room. When they were nearly done pulling the cables above the ceiling, one worker (Worker A) felt a tingling sensation in his arm where it was touching the ceiling tile grid. At this point they stopped all further work, replaced the ceiling tile, secured the ladders and left the area. Neither worker thought to call 911 and the incident was not reported until the following morning. Worker A was directed to report to the Argonne medical department for an examination. Based on the shock having originated from the lighting circuit, the electrical severity has been calculated to be 3150. No evidence of damage from the shock event was found. The manufacturer has been contacted to obtain detailed information regarding installation instructions and, once this information is obtained, further investigation will be performed to more definitively pinpoint what is causing the inadequate grounding that has been found. A fact finding meeting was held.

Similar OR Report Number:

Facility Manager:

Name	BARKALOW, THOMAS W
Phone	(630) 252-9243
Title	SUF ESH/QA COORDINATOR

Originator:

Name	BARKALOW, THOMAS W
Phone	(630) 252-9243
Title	SUF ESH/QA COORDINATOR

HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:

Date	Time	Person Notified	Organization
11/17/2011	11:45 (CTZ)	R. Colglazier	ANL-PMA
11/17/2011	12:30 (CTZ)	J. Houck	DOE-ASO

Authorized Classifier(AC):

9)Report Number: [SC--ASO-ANLE-ANLEFMS-2011-0017](#) After 2003 Redesign

Secretarial Office: Science

Lab/Site/Org: Argonne National Laboratory East

Facility Name: Facility Management Services

Subject/Title: Subcontractor Excavator Struck Buried Conduit

Date/Time Discovered: 11/16/2011 14:00 (CTZ)

Date/Time Categorized: 11/18/2011 16:30 (CTZ)

Report Type: Notification/Final

Report Dates:	Notification	11/22/2011	17:48 (ETZ)
	Initial Update	11/22/2011	17:48 (ETZ)
	Latest Update	11/22/2011	17:48 (ETZ)
	Final	11/22/2011	17:48 (ETZ)

Significance Category: 4

Reporting Criteria: 10(3) - A near miss, where no barrier or only one barrier prevented an event from having a reportable consequence. One of the four significance categories should be assigned to the near miss, based on an evaluation of the potential risks and the corrective actions taken. (1 of 4 criteria - This is a SC 4 occurrence)

Cause Codes:

ISM: 4) Perform Work Within Controls

Subcontractor Involved: Yes
Concord Excavating Enterprises, Inc.

Occurrence Description: At approximately 1400 hours on November 16, 2011, an excavation subcontractor to the Energy Sciences Building (ESB) struck and exposed a metallic electrical conduit for the Building 222 parking lot light fixture while digging in an area immediately east of the Building 222 loading dock. The conductors of the 277 volt lighting circuit were not energized as a timer used to control the light was not set to power the light until 1700 hours at twilight.

There was no injury in this event. Excavation work was paused. Notifications were made. An investigation involving the excavation contractor, the general contractor, and Facility Management & Services (FMS) project management was initiated.

Cause Description: Digging on the day of the incident had been authorized earlier in the week by three Argonne utility restrictors (personnel responsible for locating the underground utilities) in Area C on the east side of Building 222. The electrical utility restrictor authorized digging east of the sidewalk but not west of the sidewalk where a lighting fixture was located. That restrictor had expected to be recontacted when excavation activities needed to move

to the west side of the sidewalk but was not. The subcontractor understood that machine digging west of the sidewalk at a distance of greater than three feet from that lighting fixture was acceptable. The conduit struck was about seven feet from the lighting fixture and served the parking lot lighting fixture to the north of Building 222.

Operating Conditions: Daylight hours, dry weather conditions, excavation activities with machine.

Activity Category: Construction

Immediate Action(s): Excavation activities for this project were paused.

The FMS building maintenance group was notified and the line was confirmed as in a no power configuration at that time. The circuit was then locked out/tagged out at the breaker and verified as deenergized.

Project management personnel met with the general contractor on-site management and with the subcontractor excavation on-site management to initiate the investigation.

Additional notifications were completed the morning of November 17, 2011, including the FMS ORPS facility manager designee. An initial evaluation of the incident resulted in a screening of no ORPS but further consultations determined it to be reportable under a near-miss management concern.

FM Evaluation: The incident investigation has been conducted and documented using the (Argonne) ANL-239 Incident Description form and the (Clark Construction Group LLC) general contractor Incident Investigation Report Form. The excavation work was correctly paused. A fact-finding was conducted on November 21, 2011. Corrective actions have been submitted by the general contractor and accepted by FMS project management for the ESB.

It has been verified that a Dig Permit No. 85 was active for this Area C. Fact determined that:

The dig permit drawing shows the buried electrical line that was hit; shows it crossing the area where the digging occurred; and describes the line as "UE" (underground electrical) with "2' cover" (two feet of cover).

The parking lot is marked with red paint indicating the presence of underground electrical leading up to the parking lot light. The sidewalk light pole in the area of the digging was also marked at its base with red paint. (The drawing shows the electrical line running from the sidewalk light to the parking lot light, across the area where digging occurred.)

The permit for Area C includes standard Dig Permit Notes 2 and 4. Note 2 states: "Restrictor must be present when digging within 3'-0" of utilities, electric, telephone, gas and sewer."

Note 4 states: "Hand dig around any electric, telephone, utilities, gas, or

sewer until the line is fully exposed."

No Dig Restrictor was present during the digging, in non-compliance with Note 2.

The line was hit by an excavator, as opposed to during hand digging, which would indicate non-compliance with Note 4.

Corrective actions include removal of the subcontractor's foreman from the jobsite until he has reattended and successfully passed Excavation Competent Training. The subcontractor's superintendent has been removed from his position and replaced. The entire subcontractor's workforce has attended a mandatory Dig Permit Procedures training class facilitated by the general contractor. For the next four weeks, excavations in an area with restrictions or within ten feet of known marked utilities, the general contractor will attend the pre-dig meeting between the restrictors and the subcontractor. An improved dig permit request process has been implemented between the general and the excavation subcontractor. The Argonne procedure requiring an immediate 9-1-1 call when a dig encounters a utility has been implemented into the general contractor's ES&H Program and directed to the subcontractor. (The personnel of both organizations had been informed of this during their Contractor Safety Orientation presented by Argonne prior to working on the site.)

DOE Facility Representative

Input:

DOE Program Manager

Input:

Further Evaluation is Required: No

Division or Project: Fac. Mgmt. & Servs. Div./Office of Proj. Mgmt.

Plant Area: 200 Area

System/Building/Equipment: Parking Lot Light Electrical Circuit/222/Excavator

Facility Function: Balance-of-Plant - Site/outside utilities

Corrective Action:

Lessons(s) Learned:

HQ Keywords: 01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous)
01R--Inadequate Conduct of Operations - Management issues
07D--Electrical Systems - Electrical Wiring
08F--OSHA Reportable/Industrial Hygiene - Industrial Operations Issues
08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance
08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical)
11G--Other - Subcontractor
12K--EH Categories - Near Miss (Could have been a serious injury or fatality)
14E--Quality Assurance - Work Process Deficiency

14G--Quality Assurance - Procurement Deficiency

HQ Summary:

On November 16, 2011, an excavation subcontractor to the Energy Sciences Building (ESB) struck and exposed a metallic electrical conduit for the Building 222 parking lot light fixture while digging in an area immediately east of the loading dock. The conductors of the 277 volt lighting circuit were not energized as the timer used to control the light had not yet activated the circuit. Digging on the day of the incident had been authorized earlier in the week by three Argonne utility restrictors (personnel responsible for locating the underground utilities) in Area C on the east side of Building 222. The electrical utility restrictor authorized digging east of the sidewalk, but not west of the sidewalk where the lighting fixture was located. The restrictor had expected to be contacted when excavation activities needed to move to the west side of the sidewalk, but was not. The subcontractor understood that machine digging west of the sidewalk at a distance of greater than three feet from that lighting fixture was acceptable. The conduit struck was about seven feet from the lighting fixture and served the parking lot lighting fixture to the north of Building 222. There was no injury in this event. Excavation work was paused. Notifications were made. An investigation involving the excavation contractor, the general contractor, and Facility Management & Services project management was initiated.

Similar OR Report Number:

Facility Manager:

Name	K. Hellman
Phone	(630) 252-8930
Title	Associate Director, Facilities Mgmt & Services Div

Originator:

Name	BENKERT, JOHN J
Phone	(630) 252-4335
Title	

HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:

Date	Time	Person Notified	Organization
11/16/2011	18:56 (CTZ)	K. Hellman	ANLEFMS
11/17/2011	08:00 (CTZ)	C. Schumann	DOE-ASO

Authorized Classifier(AC):

10)Report Number: [SC--BHSO-BNL-BNL-2011-0030](#) After 2003 Redesign

Secretarial Office: Science

Lab/Site/Org: Brookhaven National Laboratory

Facility Name: Brookhaven National Laboratory (BOP)

Subject/Title: Electrical Shock from Light Switch

Date/Time Discovered: 11/03/2011 13:15 (ETZ)

Date/Time Categorized: 11/03/2011 16:00 (ETZ)

Report Type: Update

Report Dates:

Notification	11/04/2011	16:18 (ETZ)
Initial Update	11/08/2011	02:02 (ETZ)
Latest Update	11/08/2011	02:05 (ETZ)
Final		

Significance Category: 2

Reporting Criteria: 2C(1) - Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or disturbance of a previously unknown or mislocated hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas) resulting in a person contacting (burn, shock, etc.) hazardous energy.

Cause Codes:

ISM:

Subcontractor Involved: No

Occurrence Description: On November 3, 2011, at Brookhaven National Laboratory (BNL) an employee received an electrical shock when he attempted to turn off the lights (actuated wall light switch) while exiting Building 452. The employee was not injured.

On November 3, 2011, at 1345, this event was initially categorized as a Significance Category (SC)3 event. At 1600 it was re-categorized to a SC2 event.

Cause Description:

Operating Conditions: Normal Operations

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

Immediate Action(s): The worker was taken to the BNL Occupational Medical Clinic for evaluation and released. The electrical circuit supplying power to the switch was locked and tagged out. An investigation was commenced.

FM Evaluation: 11/08/2011, Update: Corrected dates listed in the Description of Occurrence field.

DOE Facility Representative

Input:

DOE Program Manager

Input:

Further Evaluation is Yes.

Required: Before Further Operation? No

By Whom:
By When:

Division or Project: Facility & Operations Directorate
Plant Area: Office
System/Building/Equipment: Building 452
Facility Function: Balance-of-Plant - Offices

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 November 3, 2011, at Brookhaven National Laboratory (BNL) an employee received an electrical shock when he attempted to turn off the lights (actuated wall light switch) while exiting Building 452. The employee was not injured and was taken to the BNL Occupational Medical Clinic for evaluation and released. The electrical circuit supplying power to the switch was locked and tagged out. An investigation was commenced.

Similar OR Report Number:

Facility Manager:

Name	COSTA, RAYMOND
Phone	(631) 344-8227
Title	F&O OPERATIONAL EXCELLENCE MANAGER

Originator:

Name	SIERRA, EDWARD A
Phone	(631) 344-4080
Title	LLL/ORPS COORDINATOR

HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:

Date	Time	Person Notified	Organization
11/03/2011	13:15 (ETZ)	K. Sullivan	BNL
11/03/2011	16:00 (ETZ)	A. Janczewski	DOE/BHSO

Authorized Classifier(AC):

11)Report Number: [SC--BHSO-BNL-BNL-2011-0031](#) After 2003 Redesign
Secretarial Office: Science
Lab/Site/Org: Brookhaven National Laboratory
Facility Name: Brookhaven National Laboratory (BOP)
Subject/Title: Unintended Contact with Energized Conductor

Date/Time Discovered: 11/02/2011 14:15 (ETZ)

Date/Time Categorized: 11/02/2011 15:15 (ETZ)

Report Type: Notification

Report Dates:

Notification	11/04/2011	16:19 (ETZ)
Initial Update		
Latest Update		
Final		

Significance Category: 3

Reporting Criteria: 2C(2) - Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or a site condition that results in the unexpected discovery of an uncontrolled hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas). 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
Conroy Electrical

Occurrence Description: While constructing a floor in Building 480 a contract worker inadvertently drove a screw into a metallic sheathed "BX" cable causing the 277 Volt energized conductor too short to the grounded metallic sheath. The installed electrical protection device (circuit breaker) tripped as designed in response to the short. The worker did not receive an electrical shock. No further damage occurred.

Cause Description:

Operating Conditions: Normal Operations

Activity Category: Construction

Immediate Action(s): All work was stopped and the electrical line was locked and tagged out until an investigation could be completed.

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: Facility & Operations Directorate

Plant Area: Building 480
System/Building/Equipment: Building 480
Facility Function: Balance-of-Plant - Offices
Corrective Action:
Lessons(s) Learned:

HQ Keywords: 08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical)
 11G--Other - Subcontractor
 12C--EH Categories - Electrical Safety
 14G--Quality Assurance - Procurement Deficiency

HQ Summary: On November 2, 2011, while constructing a floor in Building 480 a contract worker inadvertently drove a screw into a metallic sheathed "BX" cable causing the 277-volt energized conductor too short to the grounded metallic sheath. The installed circuit breaker tripped as designed in response to the short. The worker did not receive an electrical shock. No further damage occurred. All work was stopped and the electrical line was locked and tagged out until an investigation could be completed.

Similar OR Report Number:

Facility Manager:

Name	COSTA, RAYMOND
Phone	(631) 344-8227
Title	F&O OPERATIONAL EXCELLENCE MANAGER

Originator:

Name	SIERRA, EDWARD A
Phone	(631) 344-4080
Title	LLL/ORPS COORDINATOR

HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:

Date	Time	Person Notified	Organization
11/02/2011	15:40 (ETZ)	K. Sullivan	BNL
11/02/2011	16:40 (ETZ)	A. Janczewski	DOE/BHSO

Authorized Classifier(AC):

12)Report Number: [SC--TJSO-JSA-TJNAF-2011-0014](#) After 2003 Redesign
Secretarial Office: Science
Lab/Site/Org: Thomas Jefferson National Accelerator Site
Facility Name: Thomas Jefferson Nat'l Accelerator
Subject/Title: ACC-11-1117-NEW Near Miss while Resetting Power Supply Shunt MAQ1S01
Date/Time Discovered: 11/18/2011 10:00 (ETZ)
Date/Time Categorized: 11/21/2011 15:20 (ETZ)

Report Type: Notification

Report Dates:

Notification	11/22/2011	10:18 (ETZ)
Initial Update		
Latest Update		
Final		

Significance Category: 3

Reporting Criteria: 10(3) - A near miss, where no barrier or only one barrier prevented an event from having a reportable consequence. One of the four significance categories should be assigned to the near miss, based on an evaluation of the potential risks and the corrective actions taken. (1 of 4 criteria - This is a SC 3 occurrence)

Cause Codes:

ISM:

Subcontractor Involved: No

Occurrence Description: On Friday, November 18, 2011, shunt MAQ1S01 was reset using a paper clip. The shunt module floats at the box power supply voltage and the chassis is labeled with a high voltage warning. Typically a non-conductive tool, centrally located for use by all Operators, is used for this reset operation.

The metallic paperclip was inserted into the pencil point sized reset hole on the front of the chassis. Inserting a conductive element into the chassis exposed the operator to the operating voltage of the power supply. If the end of the paperclip had been mis-directed or touched another element of the shunt card and not the plastic end of the reset button, the operator could have received a shock.

Cause Description:

Operating Conditions: Normal Operations delivering Beam to Halls

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

Immediate Action(s):

- 1) Retrained all Operators on all shifts; beam was shut down and training was conducted at a power supply unit.
- 2) Danger labels were placed over shunt reset openings.
- 3) Two non-conductive reset tools were placed at each shunt chassis.

FM Evaluation:

DOE Facility Representative

Input:

DOE Program Manager

Input:

Further Evaluation is Required: Yes.
 Before Further Operation? No
 By Whom: Site Electrical SME
 By When:

Division or Project: Accelerator Division

Plant Area: North LINAC

System/Building/Equipment: Power Supply Shunt Reset button

Facility Function: Accelerators

Corrective Action:

Lessons(s) Learned:

HQ Keywords: 01E--Inadequate Conduct of Operations - Operations Procedure Noncompliance
 08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical)
 12K--EH Categories - Near Miss (Could have been a serious injury or fatality)
 14E--Quality Assurance - Work Process Deficiency

HQ Summary: On November 18, 2011, an operator reset a shunt to a power supply with a paper clip instead of a non-conductive tool available for this purpose. This is considered a near miss since the paper clip inserted by the operator into the front of the chassis could have touched a conductive element of the shunt card, thereby exposing the operator to the operating voltage of the power supply. The beam was shut down, danger labels were placed at all shunt reset openings, and all operators were retrained. Two non-conductive reset tools were placed at each shunt chassis.

Similar OR Report Number:

Facility Manager:

Name	SMITH, STEPHEN JAY
Phone	(757) 269-7007
Title	LEAD QUALITY AND SAFETY ENGINEER

Originator:

Name	SMITH, STEPHEN JAY
Phone	(757) 269-7007
Title	LEAD QUALITY AND SAFETY ENGINEER

HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:

Date	Time	Person Notified	Organization
11/18/2011	10:51 (ETZ)	Steve Neilson	TJSO

Authorized Classifier(AC): Stephen Smith Date: 11/21/2011

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