Office of Health, Safety and Security

Monthly Analysis of Electrical Safety Occurrences

June 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

There were sixteen electrical safety occurrences reported in June, compared to six occurrences reported in May. The total number of electrical shocks increased in June; however, the electrical severity index for the DOE complex decreased. One area for discussion by the electrical safety community concerns the safe and proper use of electrical test equipment. In June there were two occurrences in which testing equipment (e.g., motor rotation meters) failed when they were exposed to energized circuits. Similar occurrences have happened in the past, one in 2010 and another in 2006. Although the motor rotation meters are marked to indicate that they are not to be connected to energized circuits, they can easily be confused with another meter (phase sequence indicator) from the same manufacturer, which is used energized. Work control documents need to identify these types of potential traps to help increase worker awareness. Lessons learned and corrective actions from these types of occurrences should be highlighted shared throughout the DOE complex.

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).

Electrical Shock

There were five occurrences in June that resulted in an electrical shock. Two of the shocks were deemed non-hazardous (static and radio frequency) and the other three were related to equipment maintenance or inspection issues and an abandoned energized hazard (120-volt

circuit emergency lighting circuit). In most cases, these types of shocks can be prevented. These occurrences are summarized below.

1. While performing maintenance on a diesel generator, a mechanic sustained a shock when his arm brushed against an abandoned energized 120-volt electrical circuit, which was part of an emergency lighting circuit. The mechanic received a small burn mark on his right wrist.

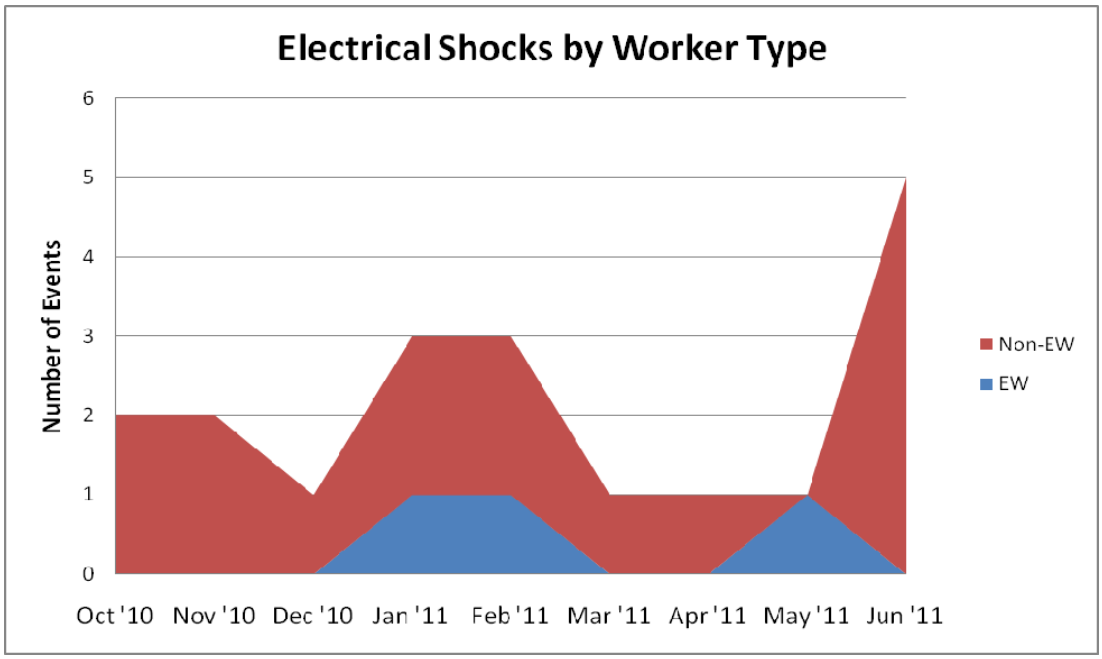
2. An employee received a static shock while removing lead shielding windows from a hot cell. Electricians performed zero energy verifications, and notifications were made to other projects with similar windows. Bonding of the window could have prevented the buildup of static electricity.

3. A nuclear chemical operator received an electrical shock while manipulating a toggle switch on a lighting control box. The operator was medically evaluated and the power was isolated.

4. During the inspection of a weld, a welding inspector felt a tingling sensation from a non-hazardous electrical shock to both of his hands and arms when he touched the pipe being welded and a grounded structure at the same time that an arc was struck. An electrical safety officer found zero voltage between those locations and verified continuity to ground. The sensation felt by the inspector resulted from the high frequency transient created by the arc strike.

5. A technician received an electrical shock from exposed 110-volt terminals on a piece of electrical equipment that was built by an outside group. The equipment was not listed by a Nationally Recognized Testing Laboratory and had not been reviewed per the site's electrical equipment inspection program.

The following chart shows that non-electrical workers have experienced the majority of the electrical shocks. Since the beginning of FY 2011, 84 percent of the occurrences that resulted in contact with electrical energy involved non-electrical workers. It is expected that electrical workers would have a low incidence of electrical shock because of their knowledge, skills and abilities. Electrical safety awareness training is important for non-electrical workers, but we also need to eliminate hazards that might not be obvious to the non-electrical worker. These hazards can be in the form of poorly maintained equipment (e.g., not properly bonded or grounded), faulty switches, outlets and electrical connections, or energized circuits that are abandoned in place.



Electrical Intrusions

In June there were three occurrences involving electrical penetration/cutting of electrical conductors and only one of them was a planned penetration event. These occurrences are summarized below.

1. While moving an equipment cart (tank dolly), the stabilizing guard on the dolly accidentally cut the insulation on an energized 120-volt extension cord, tripping a GFCI. The work instructions clearly included steps to prevent cords from being in the pathway of the dollies. Adherence to those instructions as well as a housekeeping inspection before using the tank dolly would likely have prevented this event.

2. While moving an A-frame hoist, a 440-volt electrical cable was cut, severing some of the conductors. The cable that was coiled on a bracket attached to a cord reel was pulled tight against the framework when personnel heard a "pop." After the equipment was placed in a safe condition, personnel noted burn marks on the cable and the metal bracket. All personnel were 10 feet away from the A-frame when the event occurred.

3. An electrician accidentally drilled into an energized lighting circuit conduit while performing a blind penetration of a gypsum wall. The electrician was wearing dielectric gloves and had a Class I Penetration Permit and was working in accordance with an Integrated Work Document for the work. The electrician used a screw driver to probe into the both sides of the wall and did not detect the metal conduit, which was located flush with the edge of a steel stud. The electrician then used a hole saw to drill through two layers of drywall and wire mesh. The pilot bit of the hole saw drilled into the conduit and tripped the circuit breaker.

There was one vehicle intrusion occurrence, in which the boom of an excavator accidentally struck and damaged an energized 120-volt overhead light fixture. The fixture was knocked

free of its electrical connections and fell to the ground next to the excavator. There was no electrical exposure to personnel. Most events that involve vehicle intrusion, penetration, or excavation are associated with industrial operations and typically have nothing to do with planned electrical work. They are typically prevented by sound conduct of operations practices.

Hazardous Energy Control

In June there were three reported occurrences involving lockout/tagout (LOTO) issues. These occurrences are summarized below.

1. After deactivation of a Radio Fire Alarm Reporter and the Fire Alarm Control Panel it was found that the LOTO process was not followed properly.

2. Electrical and Instrumentation technicians were preparing to replace a relay for a weld test cell door, when they discovered 120-volts on the relay. The LOTO was established following determination of safe energy state, but that determination was at the LOTO boundary rather than at the relay work location. Because the lockout contained warnings that the work was in the vicinity of other energized components, the technicians elected to test all accessible components within the cabinet and found the energized relay.

3. Two vendor technicians, who were onsite for training, inappropriately performed troubleshooting on an elevator and opened a 480-volt electrical panel without following the site's hazardous energy control procedures. The panel was secured and there was no contact with electrical energy.

The Department recognized May as *National Electrical Safety Month* with a focus on hazardous energy control awareness. The EFCOG Electrical Safety Task Group prepared training materials, posters, and other important information for the campaign. This material is available at http://www.efcog.org/wg/esh_es/electrical_safety_month.htm .

The following table shows a breakdown of the outcomes, performance issues, and worker types associated with electrical safety occurrences for June, 2011.

Number of Occurrences	Involving:	Last Month
5	Electrical Shocks	1
1	Electrical Burns	0
3	Hazardous Energy Control	5
1	Inadequate Job Planning	2
3	Inadvertent Drilling/Cutting of Electrical Conductors	0
0	Excavation of Electrical Conductors	1
1	Vehicle Intrusion of Electrical Conductors or Equipment	0

Number of Occurrences	Involving:	Last Month
5	Electrical Near Misses	3
5	Electrical Workers	3
11	Non-Electrical Workers	3
3	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.

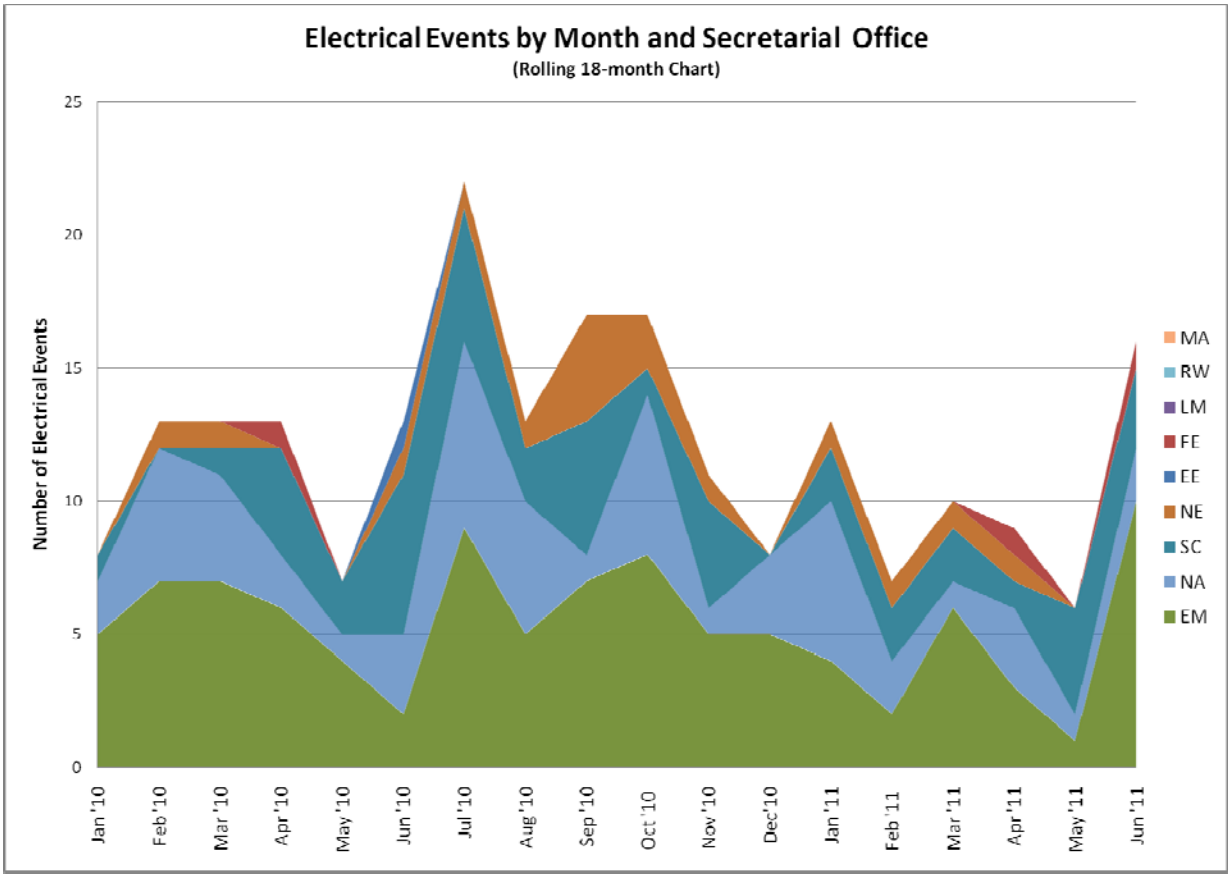
In compiling the monthly totals, the search initially looked for occurrence discovery dates in this month (excluding Significance Category R reports), and for the following ORPS "HQ keywords":
01K – Lockout/Tagout Electrical, 01M - Inadequate Job Planning (Electrical),
08A – Electrical Shock, 08J – Near Miss (Electrical), 12C – Electrical Safety

Below is the current summary of the electrical safety occurrences for CY 2011:

Period	Electrical Safety Occurrences	Shocks	Burns	Fatalities
June	16	5	1	0
May	6	1	0	0
April	9	1	0	0
March	10	1	0	0
February	7	3	0	0
January	13	3	1	0
2011 total	61 (avg. 10.2/month)	14	2	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 increased from last month's average of 9.0 because of the increase in the number of occurrences. The six month average for the previous four years is 10.5, which puts June 2011 just slightly below at 10.2 events per month.

The following chart shows the distribution of electrical safety occurrences by secretarial office. As can be seen, the biggest contributor for June was from activities reported at Environmental Management sites.

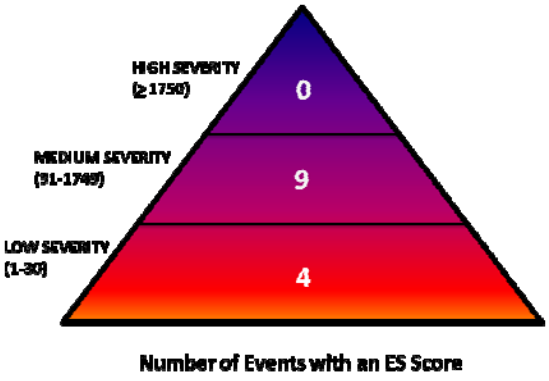


Electrical Severity

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.

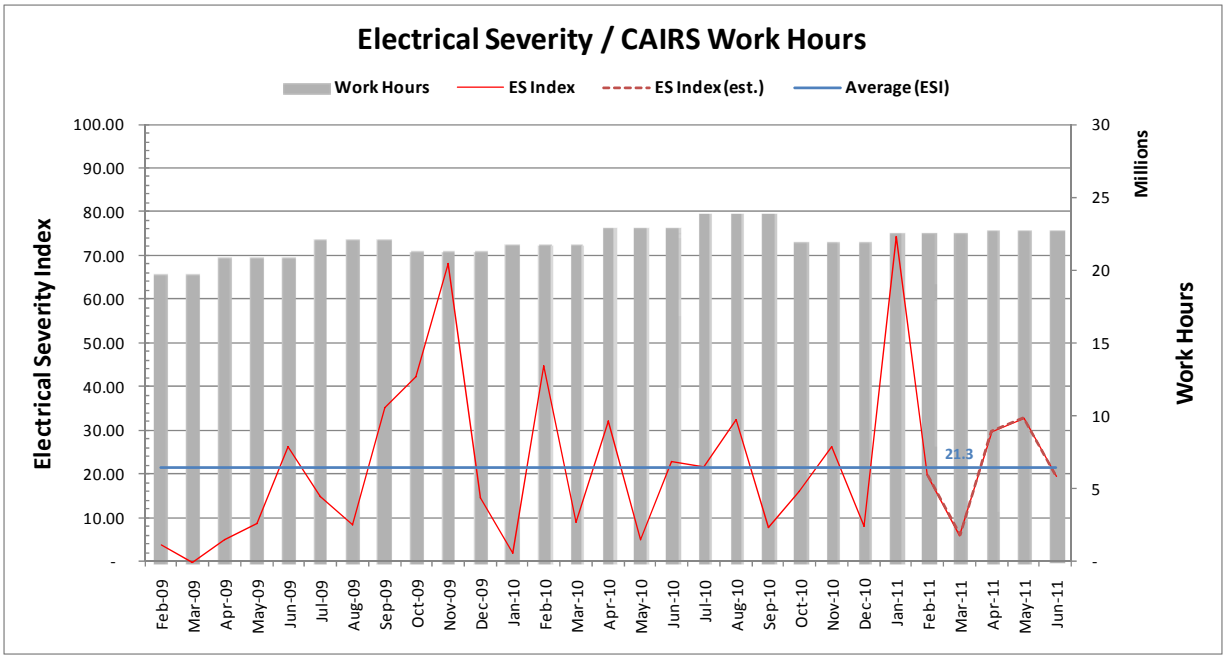
Electrical Severity Scores

The electrical severity scores 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. Three of the electrical occurrences this month did not have an Electrical Severity (ES) score. The other 13 events are distributed as shown in the triangle, with the highest ES score being 1050. The actual score for each event is provided in the event tables (Attachment 1).



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. Each DOE site calculates their own ESI and sets their own annual ESI goals. These ESI goals can vary from 0.22 to 160.0. Presently, the DOE complex goal is for the monthly ESI to be below the average ESI and to reduce the average ESI for the DOE complex to < 20.0. This average ESI goal was established based on the average ESI for 2009 (18.99) and 2010 (19.03). The following chart shows a calculated ESI for the DOE complex.



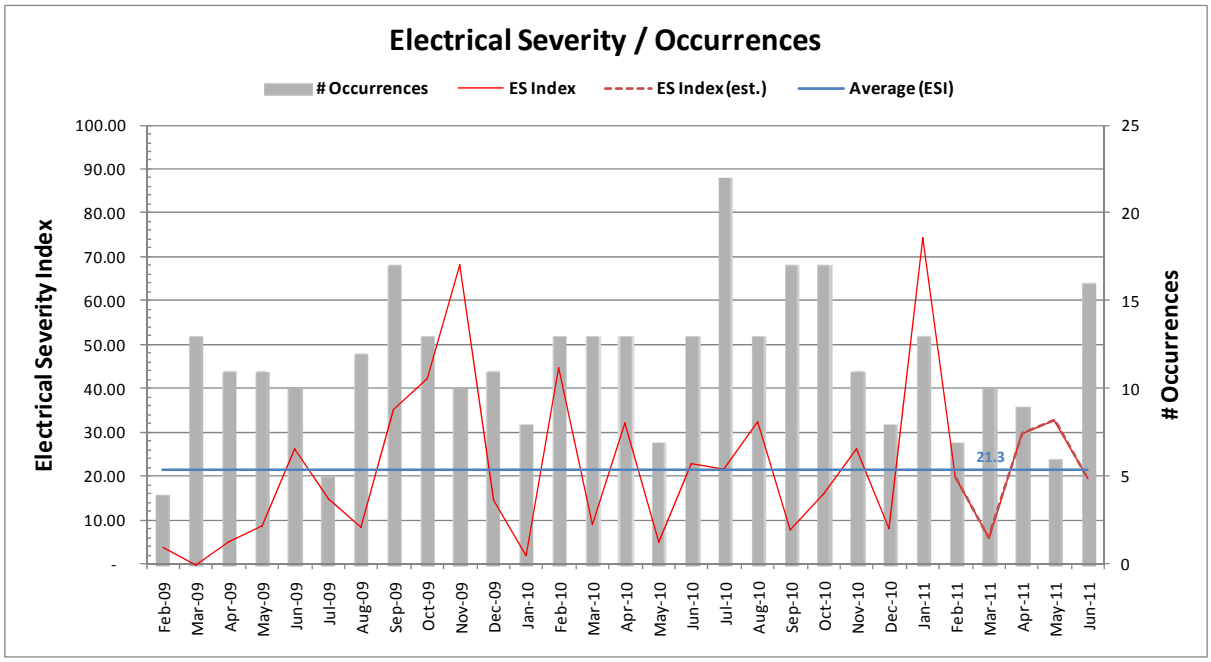
Note: An estimated ESI is calculated until accurate CAIRS man-hours are available. The chart is updated monthly.

Category	May	June	Δ
Total Occurrences	6	16	+10
Total Electrical Severity	3,700	2211	-1489
Estimated Work Hours	22,629,634* (22,301,737)	22,631,855	+2,221
ES Index	32.70* (33.18)	19.54	-13.16
Average ESI	21.4	21.3	-0.1

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

Electrical Severity Index = (Σ Electrical Severity / Σ Work Hours) 200,000

The following chart shows ESI with the number of Occurrences instead of work hours.

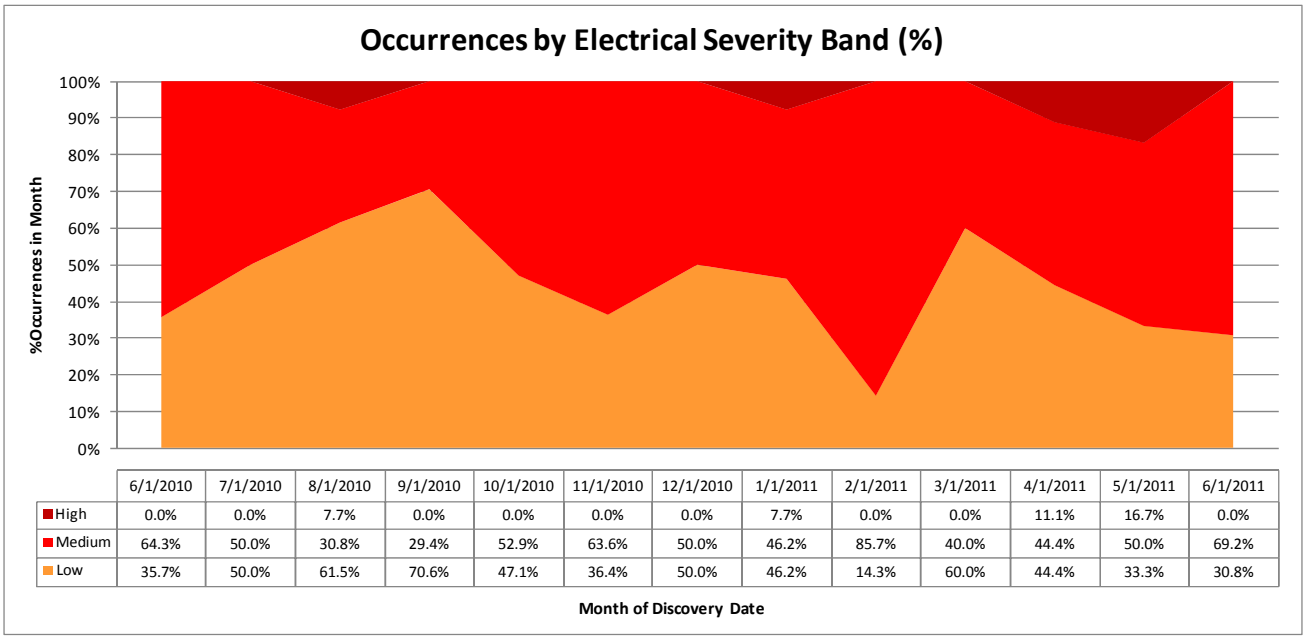


The average ESI has increased from 19.2 in June 2010 to 21.3 in June 2011. The ongoing efforts of the EFCOG Electrical Safety Subgroup and the recommendations from the various subcommittees (e.g., Hazardous Energy Control, Subsurface Investigation, etc.) can help reduce the number of medium and high electrical severity events and thus reduce the ESI.

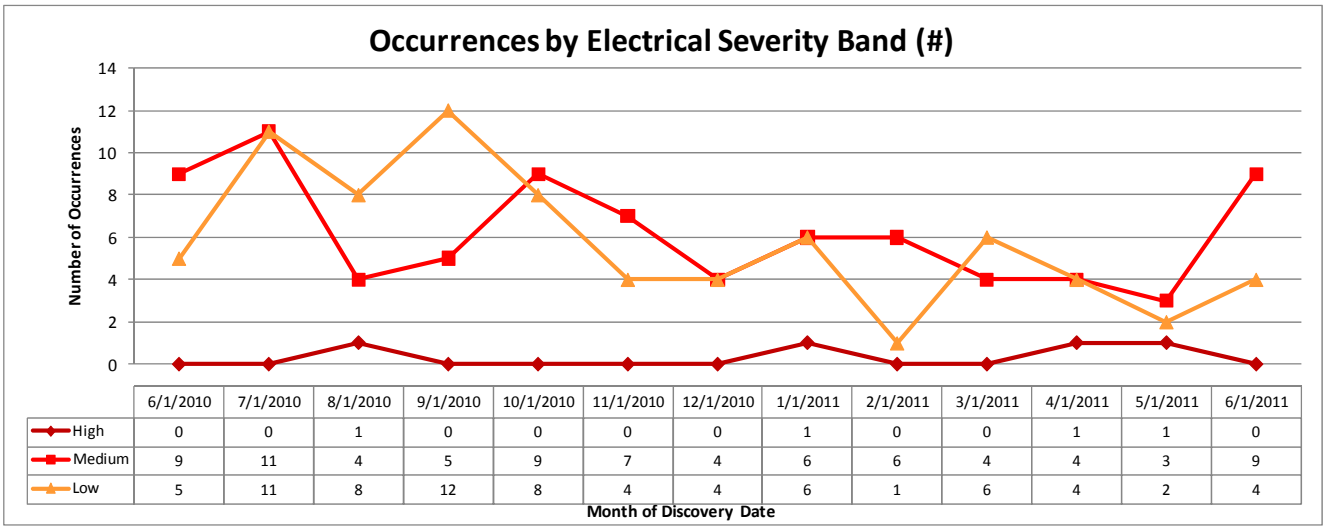
Summary of Occurrences by Severity Band

For the interval June 2010 through June 2011 (current month and the past 12), the next two charts summarize occurrences by severity band and month of discovery date:

- By percentage of total occurrences in month
- By number of occurrences in month



	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010	1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011
High	0.0%	0.0%	7.7%	0.0%	0.0%	0.0%	0.0%	7.7%	0.0%	0.0%	11.1%	16.7%	0.0%
Medium	64.3%	50.0%	30.8%	29.4%	52.9%	63.6%	50.0%	46.2%	85.7%	40.0%	44.4%	50.0%	69.2%
Low	35.7%	50.0%	61.5%	70.6%	47.1%	36.4%	50.0%	46.2%	14.3%	60.0%	44.4%	33.3%	30.8%

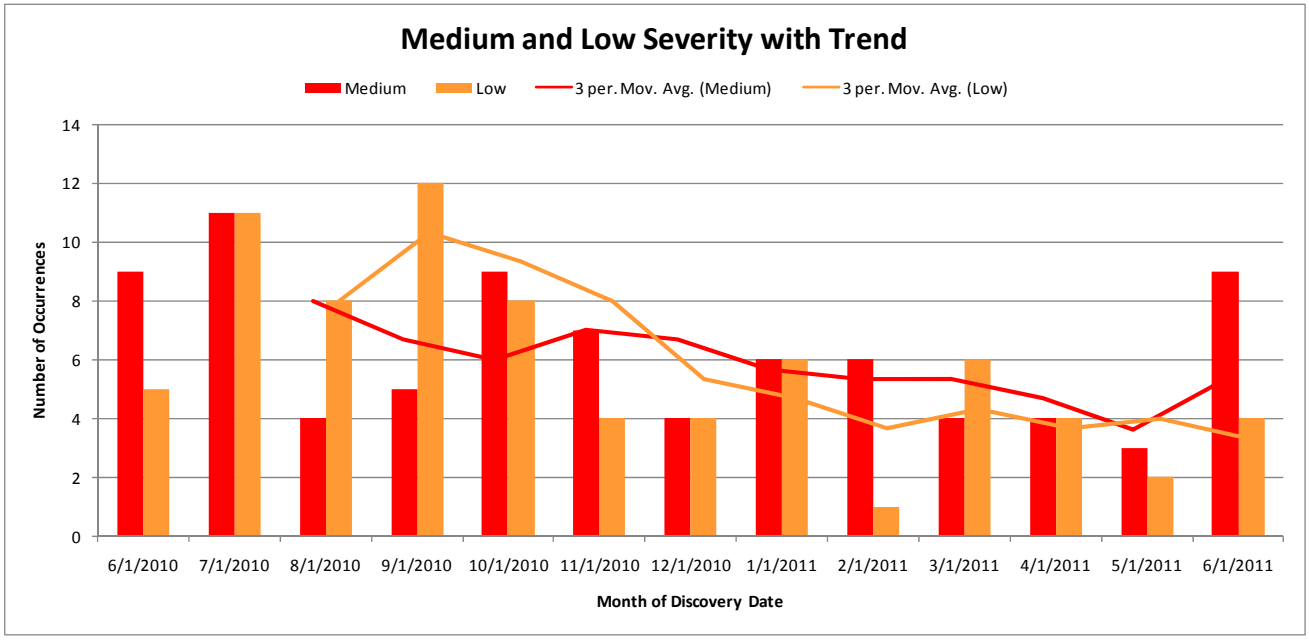


	6/1/2010	7/1/2010	8/1/2010	9/1/2010	10/1/2010	11/1/2010	12/1/2010	1/1/2011	2/1/2011	3/1/2011	4/1/2011	5/1/2011	6/1/2011
High	0	0	1	0	0	0	0	1	0	0	1	1	0
Medium	9	11	4	5	9	7	4	6	6	4	4	3	9
Low	5	11	8	12	8	4	4	6	1	6	4	2	4

What we can see from the previous two charts is that the number of occurrences with High electrical severity scores decreased to zero for the June and that the number of occurrences with Low electrical severity scores and Medium scores both increased. There were more Medium severity occurrences than Low severity occurrences. Ideally, we want to see more Low than Medium severity occurrences as in September 2010 and March 2011.

Medium and Low Severity with Trend

The following chart focuses on the Medium and Low severity data series for June 2010 through June 2011. Trend lines are included for each, using a 3-month moving average.



The 3-month moving average shows continued improvement in Low severity events and slight increase in Medium 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 – June 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--BHSO-BNL-BNL-2011-0014	A mechanic's arm touched an abandoned energized 120V emergency lighting circuit.	X	X							2	2C(1)	330
2	EM-ID--CWI-BIC-2011-0004	An employee received a static shock while removing a lead shielding window.	X								2	2C(1)	1
3	EM-ID--CWI-IWTU-2011-0007	Carpenters found a damaged 240V energized electrical cable.									3	2C(2)	100
4	EM-ID--CWI-IWTU-2011-0008	A phase rotation meter failed when it was incorrectly connected to a pump circuit.									3	2C(2)	50
5	EM-RL--CPRC-CENTPLAT-2011-0004	The LOTO process was not followed when deactivating a radio fire alarm reporter and fire alarm control panel.				X					3	2C(2)	0
6	EM-RL--CPRC-CENTPLAT-2011-0005	Energized 120V extension cord insulation was cut resulting in a spark and GFCI trip.							X		4	10(2)	0
7	EM-RL--CPRC-SNF 2011-0003	An operator received a shock while positioning a toggle switch on a lighting control box.	X								2	2C(1)	110
8	EM-RL--CPRC-SOLIDWASTE-2011-0007	Boom of an excavator struck and damaged an energized 120V overhead light fixture.								X	3	10(2)	10
9	EM-RL--CPRC-SOLIDWASTE-2011-0008	While moving an A-frame hoist, a 440V cable was cut, severing some of the conductors.							X		3	10(2)	50
10	EM-SR--SRR-WVIT-2011-0004	Initial zero-energy check did not identify 120V source to a relay that was locked out for replacement.				X					3	2C(2)	10
11	FE--NETL-GOPE-NETLMGN-2011-0004	An electrician used the wrong test equipment on an energized circuit and damaged the meter.									4	10(3)	1050

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]
12	NA--LASO-LANL-ADOADMIN-2011-0006	An electrician drilled into an energized lighting circuit conduit.					X		X		3	2C(2)	50
13	NA--LASO-LANL-ADOADMIN-2011-0007	A welding inspector received a shock to both hands and arms while touching a conduit and a section of unistrut.	X								2	2C(1)	0
14	SC--PNSO-PNNL-PNNLBOPER-2011-0006	Vendor technicians opened a 480V electrical panel without following hazardous energy control procedures.				X					3	2C(2)	100
15	SC--PNSO-PNNL-PNNLBOPER-2011-0008	A researcher cut a TC and caused a 120V spark when the diagonal cutter touched the casing.									3	2C(2)	20
16	SC--SSO-SU-SLAC-2011-0009	A technician received a 110V shock from exposed wiring in non-listed equipment.	X								3	2C(2)	330
	TOTAL		5	1	0	3	1	0	3	1			

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 event, (7) SC = ORPS significance category, (8) RC = ORPS reporting criteria, (9) ES = electrical severity

ES Scores: High is $\geq$ 1750, Medium is 31-1749, and Low is 1-30

Attachment 1

Electrical Safety Occurrences – June 2011

No	Report Number	Event Summary	EW[1]	N-EW[2]	SUB[3]	HFW[4]	WFH[5]	PPE[6]	70E[7]	VOLT[8] H	VOLT[8] L	C/I[9]	NEUT[10]	NM[11]
1	EM--BHSO-BNL-BNL-2011-0014	A mechanic's arm touched an abandoned energized 120V emergency lighting circuit.		X		X					X			
2	EM-ID--CWI-BIC-2011-0004	An employee received a static shock while removing a lead shielding window.		X		X					X			
3	EM-ID--CWI-IWTU-2011-0007	Carpenters found a damaged 240V energized electrical cable.		X			X				X			X
4	EM-ID--CWI-IWTU-2011-0008	A phase rotation meter failed when it was incorrectly connected to a pump circuit.	X			X					X			
5	EM-RL--CPRC-CENTPLAT-2011-0004	The LOTO process was not followed when deactivating a radio fire alarm reporter and fire alarm control panel.		X			X				X			
6	EM-RL--CPRC-CENTPLAT-2011-0005	Energized 120V extension cord insulation was cut resulting in a spark and GFCI trip.		X		X					X			
7	EM-RL--CPRC-SNF-2011-0003	An operator received a shock while positioning a toggle switch on a lighting control box.		X		X					X			
8	EM-RL--CPRC-SOLIDWASTE-2011-0007	Boom of an excavator struck and damaged an energized 120V overhead light fixture.		X		X					X			X
9	EM-RL--CPRC-SOLIDWASTE-2011-0008	While moving an A-frame hoist, a 440V cable was cut, severing some of the conductors.		X		X					X			X
10	EM-SR--SRR-WVIT-2011-0004	Initial zero-energy check did not identify 120V source to a relay that was locked out for replacement.	X				X				X			
11	FE--NETL-GOPE-NETLMGN-2011-0004	An electrician used the wrong test equipment on an energized circuit and damaged the meter.	X		X	X		X	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] H	VOLT[8] L	C/I[9]	NEUT[10]	NM[11]
12	NA--LASO-LANL-ADOADMIN-2011-0006	An electrician drilled into an energized lighting circuit conduit.	X			X					X			
13	NA--LASO-LANL-ADOADMIN-2011-0007	A welding inspector received a shock to both hands and arms while touching a conduit and a section of unistrut.		X	X	X					X			
14	SC--PNSO-PNNL-PNNLBOPER-2011-0006	Vendor technicians opened a 480V electrical panel without following hazardous energy control procedures.	X		X		X				X			
15	SC--PNSO-PNNL-PNNLBOPER-2011-0008	A researcher cut a TC and caused a 120V spark when the diagonal cutter touched the casing.		X		X					X			X
16	SC--SSO-SU-SLAC-2011-0009	A technician received a 110V shock from exposed wiring in non-listed equipment.		X		X					X			
	TOTAL		5	11	3	12	4	1	1	0	16	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 55280 OR(s) with 58590 occurrences(s) as of 7/18/2011 8:43:46 AM
Query selected 16 OR(s) with 16 occurrences(s) as of 7/18/2011 10:28:45 AM

Download this report in Microsoft Word format.

1)Report Number:	EM--BHSO-BNL-BNL-2011-0014 **After 2003 Redesign**
Secretarial Office:	Environmental Management
Lab/Site/Org:	Brookhaven National Laboratory
Facility Name:	Brookhaven National Laboratory (BOP)
Subject/Title:	Heavy Equipment Mechanic Sustains Electrical Shock
Date/Time Discovered:	06/15/2011 14:30 (ETZ)
Date/Time Categorized:	06/15/2011 14:40 (ETZ)
Report Type:	Update
Report Dates:	Notification 06/17/2011 09:23 (ETZ) Initial Update 06/23/2011 06:15 (ETZ) Latest Update 06/23/2011 06:15 (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:	While conducting maintenance on a diesel generator in building 912A a mechanic brushed his arm against an abandoned live electrical circuit (120VAC) which was part of the emergency lighting circuit. The mechanic sustained a mild shock.
Cause Description:	
Operating Conditions:	Maintenance of diesel generators
Activity Category:	Maintenance
Immediate Action(s):	The mechanic proceeded to the OMC for evaluation and was transported to a local hospital for further evaluation. There was a small burn mark on his right wrist. The mechanic did not identify any injury beyond the small burn and said that he felt fine.

	Electricians traced out the electrical line and de-energized it at the source. An investigation is underway.
FM Evaluation:	An evaluation is underway.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	Yes. Before Further Operation? No By Whom: By When:
Division or Project:	Site Resources Division
Plant Area:	Building 912-A
System/Building/Equipment:	Building 912-A
Facility Function:	Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)
Corrective Action:	
Lessons(s) Learned:	
HQ Keywords:	07D--Electrical Systems - Electrical Wiring 08A--OSHA Reportable/Industrial Hygiene - Electrical Shock 08D--OSHA Reportable/Industrial Hygiene - Injury 12C--EH Categories - Electrical Safety 14L--Quality Assurance - No QA Deficiency
HQ Summary:	On June 15, 2011, while performing maintenance on a diesel generator in Building 912A, a mechanic sustained a shock when he brushed his arm against an abandoned energized 120-volt electrical circuit, which was part of the emergency lighting circuit. The mechanic proceeded to the Occupational Medicine Clinic for evaluation and was transported to a local hospital for further evaluation. There was a small burn mark on his right wrist. The mechanic did not identify any injury beyond the small burn and said that he felt fine.
Similar OR Report Number:	
Facility Manager:	Name: KRASNER, KENNETH Phone: (631) 344-2563 Title: Occurrence Categorizer
Originator:	Name: KRASNER, KENNETH Phone: (631) 344-2563 Title:
HQ OC Notification:	Date | Time | Person Notified | Organization

	NA | NA | NA | NA
Other Notifications:	Date: 06/15/2011, Time: 14:30 (ETZ), Person Notified: P. Sullivan, Organization: BHSO Date: 06/15/2011, Time: 14:30 (ETZ), Person Notified: T. Lambertson, Organization: BNL/BSA
Authorized Classifier(AC):	

2)Report Number:	EM-ID--CWI-BIC-2011-0004 **After 2003 Redesign**
Secretarial Office:	Environmental Management
Lab/Site/Org:	Idaho National Laboratory
Facility Name:	ICP Demolition and Decommissioning Activities
Subject/Title:	Employee Receives a Static Shock While Removing Lead Shielding Windows From a Hot Cell
Date/Time Discovered:	06/09/2011 15:20 (MTZ)
Date/Time Categorized:	06/13/2011 15:35 (MTZ)
Report Type:	Notification
Report Dates:	Notification: 06/14/2011 19:27 (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 Thursday, June 9th, employees were in the process of removing the fourth of five lead shielding windows from TRA-632 Hot Cell #3 using a steel sledge hammer. After removing nearly a third of the fifth pane of the window an employee received a static shock. Work was suspended, foreman was notified and the area was properly posted to prevent inadvertent entry. Employee was taken to medical for a thorough evaluation and was returned to work with no restrictions.
Cause Description:	
Operating Conditions:	Demolition
Activity Category:	Facility Decontamination/Decommissioning

Immediate Action(s):	Foreman was notified, work was suspended, area was posted, employee was evaluated by medical and returned to work, electricians performed zero energy verifications, notifications were made to other projects with similar windows,
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:	CWI D&D
Plant Area:	ATRx
System/Building/Equipment:	TRA-632 Hot Cell #3
Facility Function:	Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)
Corrective Action:	
Lessons(s) Learned:	
HQ Keywords:	08A--OSHA Reportable/Industrial Hygiene - Electrical Shock 12C--EH Categories - Electrical Safety 14L--Quality Assurance - No QA Deficiency
HQ Summary:	On June 9, 2011, an employee received a static shock while removing the fifth of six lead shielding windows from TRA-632 Hot Cell #3. After removing nearly a third of the fifth pane of the window with a steel sledge hammer, the employee received the static shock. Work was suspended and the foreman was notified. The area was properly posted to prevent inadvertent entry. The employee was taken to medical for a thorough evaluation and returned to work with no restrictions. Electricians performed zero energy verifications, and notifications were made to other projects with similar windows.
Similar OR Report Number:	
Facility Manager:	Name: LANDGRAVER, CHARLES M. Phone: (208) 351-5908 Title: D & D NUCLEAR FACILITY MANAGER
Originator:	Name: BERTRAM, JESSICA C. Phone: (208) 533-0008 Title: D&D PROGRAM ADMINISTRATOR
HQ OC Notification:	Date | Time | Person Notified | Organization

	NA | NA | NA | NA
Other Notifications:	Date: 06/13/2011 | Time: 15:35 (MTZ) | Person Notified: William Watson | Organization: DOE-ID
Authorized Classifier(AC):	M. S. Casteel Date: 06/14/2011

3)Report Number:	EM-ID--CWI-IWTU-2011-0007 **After 2003 Redesign**
Secretarial Office:	Environmental Management
Lab/Site/Org:	Idaho National Laboratory
Facility Name:	Integrated Waste Treatment Unit
Subject/Title:	Damaged 240 Volt Energized Electrical Cable Found During Repair Of Temporary Building
Date/Time Discovered:	06/16/2011 11:30 (MTZ)
Date/Time Categorized:	06/16/2011 14:50 (MTZ)
Report Type:	Notification
Report Dates:	Notification: 06/20/2011 18:26 (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:	No
Occurrence Description:	At approximately 1130 hours on 6/16/2011 two carpenters repairing the fabric covering on a temporary building (referred to as the "Air Lock") discovered a live 240 volt power cable. The outer cable cover and insulation on one conducting wire was worn away exposing a bare conductor. The power cable supplied temporary power to the temporary building. The temporary building is located northwest of the IWTU bulk nitrogen and oxygen storage pad. The carpenters noticed flashes of light coming through the fabric wall they were repairing. The carpenters stopped work and entered the temporary building to investigate the source of the flashes and discovered the damaged cable and exposed conductor. The cable was hanging alongside a support column. The cable showed

	signs of arcing. The cable was live. The carpenters immediately left the area and notified supervision and a safety professional. The carpenters were not injured nor were anyone else. The DOE Facility Representative was notified at 1455 a few minutes after the Operations Manager was notified and the event categorized. The DOE Facility Representative concurred with the initial categorization. The breaker supplying the temporary power cable was immediately opened by a construction electrician and guarded until IWTU operations could apply a lock and tag to the breaker. In addition, construction electricians walked down other temporary power cables to ensure similar conditions did not exist. A witness statement was provided by the carpenter.
Cause Description:	
Operating Conditions:	Winds gusting at 15 to 20 mph
Activity Category:	Maintenance
Immediate Action(s):	Employees stopped work when flash was noticed Employees investigated and identified damaged electrical cable Employees notified safety professional Safety professional notified the safety manager Safety professional requested the shift supervisor to lock and tag the breaker Shift Supervisor notified the Operations Manager Shift Supervisor locked and tagged the breaker Shift Electricians walked down all temporary power cables to verify their condition.
FM Evaluation:	At 1450 the Operations Manager categorized the event as ORPS reportable. Group 2 - Personnel Safety and Health, Subgroup C - Hazardous Energy Control, Sequence 2, Significance Category 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."
DOE Facility Representative Input:	
DOE Program Manager Input:	

Further Evaluation is Required:	No
Division or Project:	IWTU-Idaho Completion Project
Plant Area:	IWTU - CPP- 1619
System/Building/Equipment:	Temporary Building - Remote Tools Storage
Facility Function:	Nuclear Waste Operations/Disposal
Corrective Action:	
Lessons(s) Learned:	
HQ Keywords:	01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control 07D--Electrical Systems - Electrical Wiring 08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical) 12C--EH Categories - Electrical Safety 14D--Quality Assurance - Documents and Records Deficiency
HQ Summary:	On June 16, 2011, two carpenters, who were repairing the fabric covering on a temporary building (referred to as the "Air Lock"), discovered an energized 240-volt power cable. The outer cable cover and insulation on one conducting wire were worn away exposing a bare conductor. The power cable supplied temporary power to the building. The carpenters had noticed flashes of light coming through the fabric wall they were repairing. They stopped work and entered the building to investigate the source of the flashes and discovered the damaged cable and exposed conductor. The cable was hanging next to a support column and it showed signs of arcing. The carpenters immediately left the area and notified supervision and a safety professional. A construction electrician opened the circuit breaker supplying the temporary power cable and guarded it until Integrated Waste Treatment Unit operations personnel could apply a lock and tag. In addition, construction electricians walked down other temporary power cables to ensure similar conditions did not exist.
Similar OR Report Number:	
Facility Manager:	Name: White, James M Phone: (208) 533-0872 Title: Operations Manager
Originator:	Name: BOSLEY, JAMES B Phone: (208) 351-5969 Title: STAFF ENGINEER - ISSUE MANAGEMENT CO
HQ OC Notification:	Date: NA; Time: NA; Person Notified: NA; Organization: NA
Other Notifications:	Date; Time; Person Notified; Organization

	06/16/2011 | 14:55 (MTZ) | Daphne Larsen | DOE-ID
Authorized Classifier(AC):	Vaden, Randall R Date: 06/20/2011

4)Report Number:	EM-ID--CWI-IWTU-2011-0008 **After 2003 Redesign**
Secretarial Office:	Environmental Management
Lab/Site/Org:	Idaho National Laboratory
Facility Name:	Integrated Waste Treatment Unit
Subject/Title:	Phase Rotation Meter Incorrectly Connected to Waste Feed Pump Circuit
Date/Time Discovered:	06/16/2011 23:30 (MTZ)
Date/Time Categorized:	06/23/2011 11:15 (MTZ)
Report Type:	Notification
Report Dates:	Notification 06/27/2011 17:19 (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:	4) Perform Work Within Controls
Subcontractor Involved:	No
Occurrence Description:	At approximately 2330 hours on June 16, 2011, the electricians heard a loud pop in the work area. The electricians had been assisting the IWTU test engineer with grooming package 8401; checking power to the waste feed pump control circuit. The electricians had completed the required steps in the grooming package and were picking up their tools at the time of incident. The test engineer had requested the IWTU operators to place the relays in the by-pass position when the incident occurred. The electricians donned their flash gear (20 Cal), opened the electrical panel, and identified that the motor and phase rotation tester installed earlier had arced and smoked. They notified the test engineer and construction superintendent. The electricians guarded the area while the Operations shift supervisor placed a lock and tag (LO/TO) on the system. The electrician performed zero-energy checks and the panel was inspected and photographed.

	The inspection by the construction superintendent, test engineer, and electrician determined that the motor and phase rotation tester had been hooked incorrectly to the motor rotation side of the tester. The motor rotation side states: "Do not connect to live voltage." When the relays were set in the by-pass position, the circuit was completed sending 480 volt through the waste feed pump contactor to the tester. The facility manager categorized this event on June 23, 2011 at 1115 hours as a Group 2, Subgroup C, Sequence Number (2), Significance Category 3. The DOE facility representative concurs with the categorization.
Cause Description:	
Operating Conditions:	Work was being performed indoors with adequate lighting.
Activity Category:	Facility/System/Equipment Testing
Immediate Action(s):	Electrician donned PPE before opening cabinet. Electrician visually checked panel. Electrician notified the construction superintendent. Construction superintendent notified the shift supervisor. Operation hung LO/TO on waste feed pump system. IWTU project manager stopped testing and grooming activities.
FM Evaluation:	Based on the information provided at the June 23, 2011 fact finding, the facility manager has determined that the event meets the criteria for reportability for failure to follow the prescribed hazardous energy control process (Group 2, Subgroup C, Sequence Number (2), Significance Category 3). The DOE facility representative concurs with the event categorization.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	No
Division or Project:	IWTU-Idaho Completion Project
Plant Area:	IWTU CPP-1696
System/Building/Equipment:	IWTU CPP-1696
Facility Function:	Nuclear Waste Operations/Disposal
Corrective Action:	
Lessons(s) Learned:	
HQ Keywords:	01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous) 01Q--Inadequate Conduct of Operations - Personnel error 08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance

	08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical) 12C--EH Categories - Electrical Safety 14E--Quality Assurance - Work Process Deficiency
HQ Summary:	On June 16, 2011, while assisting the Integrated Waste Treatment Unit (IWTU) test engineer with grooming package 8401, checking power to the waste feed pump control circuit, electricians heard a loud pop in the work area. The electricians had completed the required steps in the grooming package and were picking up their tools at the time of incident. The test engineer had requested the IWTU operators to place the relays in the by-pass position when the incident occurred. The electricians donned their flash gear (20 Cal), opened the electrical panel, and identified that the motor and phase rotation tester installed earlier had arced and smoked. They notified the test engineer and construction superintendent. The electricians guarded the area while the Operations shift supervisor placed a lock and tag on the system. The electrician performed zero-energy checks and the panel was inspected and photographed. It was determined that the motor and phase rotation tester had been hooked incorrectly to the motor rotation side of the tester. When the relays were set in the by-pass position, the circuit was completed sending 480 volts through the waste feed pump contactor to the tester. The IWTU project manager stopped testing and grooming activities.
Similar OR Report Number:	
Facility Manager:	Name: White, James M Phone: (208) 533-0872 Title: Operations, Facility Manager
Originator:	Name: BOSLEY, JAMES B Phone: (208) 351-5969 Title: STAFF ENGINEER - ISSUE MANAGEMENT CO
HQ OC Notification:	Date: 06/23/2011 | Time: 11:30 (MTZ) | Person Notified: Daphne Larsen | Organization: DOE-ID
Other Notifications:	Date: 06/16/2011 | Time: 23:45 (MTZ) | Person Notified: Daphne Larsen | Organization: DOE-ID Date: 06/17/2011 | Time: 06:45 (MTZ) | Person Notified: Daphne Larsen | Organization: DOE-ID
Authorized Classifier(AC):	Casteel, Michael S Date: 06/23/2011

5)Report Number:	EM-RL--CPRC-CENTPLAT-2011-0004 **After 2003 Redesign**
Secretarial Office:	Environmental Management
Lab/Site/Org:	Hanford Site
Facility Name:	Central Plateau Remediation Project

Subject/Title:	U Plant Fire Panel Deactivation Without Lockout/Tagout - ARRA
Date/Time Discovered:	06/09/2011 12:18 (PTZ)
Date/Time Categorized:	06/09/2011 13:00 (PTZ)
Report Type:	Update
Report Dates:	Notification 06/11/2011 19:16 (ETZ) Initial Update 06/13/2011 15:30 (ETZ) Latest Update 06/13/2011 15:30 (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:	Yes Mission Support Alliance
Occurrence Description:	On 6/9/11, after deactivation of the Radio Fire Alarm Reporter (RFAR) and Fire Alarm Control Panel (FACP)by Mission Support Alliance (MSA) Fire Systems Maintenance personnel, in the 221-U Building, at 200 West Area, it was found that the Lockout/Tagout process was not followed properly. There was no personnel injury as a result of this event.
Cause Description:	
Operating Conditions:	Work was underway to prepare the facility for decontamination and decommissioning.
Activity Category:	Facility Decontamination/Decommissioning
Immediate Action(s):	1. The Building Emergency Director was notified. 2. Senior Management was notified. 3. RL Facility Representative was notified. 4. A critique was scheduled an conducted.
FM Evaluation:	The facility remains in a safe condition pending further investigation of the event.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	Yes. Before Further Operation? Yes

	By Whom: Cold & Dark Management By When: 06/23/2011
Division or Project:	CHPRC/D&D Project/Cold and Dark/S&M Ops
Plant Area:	221-U Bldg/200W Area
System/Building/Equipment:	U Plant/221-U Building/Fire Panel
Facility Function:	Nuclear Waste Operations/Disposal
Corrective Action:	
Lessons(s) Learned:	
HQ Keywords:	01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical) 12I--EH Categories - Lockout/Tagout (Electrical or Mechanical) 13H--Management Concerns - American Recovery and Reinvestment Act (ARRA) 14E--Quality Assurance - Work Process Deficiency
HQ Summary:	On June 9, 2011, after deactivation of the Radio Fire Alarm Reporter and the Fire Alarm Control Panel, in the 221-U Building, at 200 West Area, it was found that the Lockout/Tagout process was not followed properly. Management notifications were made. A critique was held. There was no personnel injury as a result of this event.
Similar OR Report Number:	1. None.
Facility Manager:	Name: C.D. Lucas Phone: (509) 373-1006 Title: Director, CHPRC Cold and Dark
Originator:	Name: FEIL, RHONDA K Phone: (509) 373-4551 Title: ADMINISTRATIVE SPECIALIST
HQ OC Notification:	Date: NA; Time: NA; Person Notified: NA; Organization: NA
Other Notifications:	06/09/2011 12:18 (PTZ) C.D. Lucas CPRC/D&D 06/09/2011 12:19 (PTZ) K.L. Kehler CPRC/D&D 06/09/2011 12:25 (PTZ) R.V. Johnson RL/OOD 06/09/2011 13:00 (PTZ) ONC MSA
Authorized Classifier(AC):	

6)Report Number:	EM-RL--CPRC-CENTPLAT-2011-0005 **After 2003 Redesign**
Secretarial Office:	Environmental Management
Lab/Site/Org:	Hanford Site

Facility Name:	Central Plateau Remediation Project
Subject/Title:	Extension Cord Insulation Breach Results in Spark at 209E Critical Mass Lab
Date/Time Discovered:	06/28/2011 10:45 (PTZ)
Date/Time Categorized:	06/28/2011 12:29 (PTZ)
Report Type:	Notification/Final
Report Dates:	Notification 06/30/2011 18:09 (ETZ) Initial Update 06/30/2011 18:09 (ETZ) Latest Update 06/30/2011 18:09 (ETZ) Final 06/30/2011 18:09 (ETZ)
Significance Category:	4
Reporting Criteria:	10(2) - An event, condition, or series of events that does not meet any of the other reporting criteria, but is determined by the Facility Manager or line management to be of safety significance or of concern to other facilities or activities in the DOE complex. One of the four significance categories should be assigned to the occurrence, 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:	No
Occurrence Description:	On 6/27/11 at 0930 Hours, a stabilizing guard on an equipment cart at the D&D Project 209E Critical Mass Lab Critical Assembly Room (CAR) breached the insulation on a 120VAC extension cord. The Ground Fault Circuit Interrupter (GFCI) that was provided tripped, and the work team observed a spark. Work was stopped and the work team safely exited the work area. An initial investigation was conducted on 6/28/11. Work Evolution Detail: Removal of six slab tanks from the CAR within the Critical Mass Lab began in May 2011. Three of these tanks were removed without incident. Work on the fourth tank, TK-101, began on 6/23/11 with removal from the wall and application of fixative. The fixative application required use of a glove bag and HEPA vacuum. A Variable Speed Control (VSC) unit was used to the control the HEPA fan. This was powered from a "spider" bang board located near the entrance of the CAR. The fixative work finished up that weekend with the removal of the glove bag and HEPA vacuum. The VSC was left in place, plugged into the spider. Dismantling of Slab Tank TK-101 cooling tubes began on the morning of

	6/27/11 (Work Instruction CP-11-00433, WCN-4, Step 6.2.9). The work team, consisting of 4 pipefitters, 2 Nuclear Chemical Operators (NCOs) and 2 Radiological Control Technicians (RCTs), attended the pre-job briefing and entered the CAR to move Tank TK-101 into position for cutting off the coolant tubes from one side of the tank. The pre-job briefing covered the work instruction, including Precautions and Limitations and the need for Spotters to prevent interference with objects, and tending of the various power cables (Step 4.10, Precautions, exits and paths of egress). The task began with lifting Tank TK-101 onto the two dollies, then maneuvering the dollies and tank around a welded floor base obstacle (approximate footprint of 10 feet by 10 feet). Isle width around this obstacle was approximately 6 feet. The plan was to work the dollies around the corners of the obstacle such that the tank would straddle the obstacle, to reach the preferred location for the pipefitters to perform the tube cutting on the tank. A backup was required when circling the dollies around the final corner, which may have caused one of the front dolly wheels to stub the obstacle corner. Such an action would lead to the stabilizing sheet metal outside of the dolly wheels to hit the floor and prevent a tip-over of the tank. This sheet metal skirting normally floats about 1/4 to 1/2 inch above the floor. If in the path of the dolly, extension cords could easily pass under a stabilizer and get hung up. The stabilizers appear from photos to be 3/16 inch aluminum sheet metal. Tank TK-101 was stated as having a total weight of 1,500 pounds; enough weight to sever the insulating jacket of most extension cords when applied by the shearing action of the aluminum sheet metal. According to one of the four pipefitters positioning the tank, the spark occurred when moving forward, right after backing up to get around the final obstacle corner. The back and forth movement to get around the corner may have taken the cart off the intended pathway. The dolly may also have rocked on a second bounce into the obstacle corner (there are six sets of wheels on each cart), forcing the outside stabilizer to sheer down onto the VSC cord, and causing a short between the cord conductors. Work was then stopped and the work team safely exited the work area. An Electrician was brought in to inspect the scene. The breaker was shut off, the VSC was removed, the GFCI was reset, and 24 photos of the CAR conditions were taken. Notifications were made, and statements were taken from the eight workers present in the CAR at the time of the spark event. An initial investigation was scheduled and conducted the following day.
Cause Description:	
Operating Conditions:	The 209E Facility is undergoing normal D&D activities.

Activity Category:	Facility Decontamination/Decommissioning
Immediate Action(s):	1. Workers recognized the spark hazard, stopped work, and safely exited the work area. 2. Required notifications were made. 3. A pre-job briefing was conducted to recover from the cord spark. 4. A qualified Electrician performed an inspection, disconnected teh breaker, removed the VSC, and reset the GFCI. 5. An initial investigation was scheduled, resulting in the determination to categorize the event as a management concern.
FM Evaluation:	There was no personnel injury as a result of this event. The GFCI served its intended purpose as described in the work instruction and was a barrier to potential shock. The only damage to equipment was to the extension cord. The work area is in a safe condition, and the extension cord has been removed from service.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	No
Division or Project:	CHPRC/D&D Project/D4
Plant Area:	200 East Area
System/Building/Equipment:	209E Critical Mass Lab/120VAC Extension Cord
Facility Function:	Nuclear Waste Operations/Disposal
Corrective Action:	
Lessons(s) Learned:	The work instructions for this evolution clearly included steps to prevent cords from being in the pathway of the dollies. Adherence to those instructions as well as a housekeeping inspection prior to tank dolly use would likely have prevented this event. A Hanford Site lessons learned is planned for issuance.
HQ Keywords:	07D--Electrical Systems - Electrical Wiring 08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance 12C--EH Categories - Electrical Safety 14E--Quality Assurance - Work Process Deficiency
HQ Summary:	On June 27, 2011, a stabilizing guard on an equipment cart at the D&D Project 209E Critical Mass Lab Critical Assembly Room breached the insulation on a 120-VAC extension cord. The Ground Fault Circuit Interrupter that was provided tripped, and the work team observed a spark. The spark occurred when moving the dolly forward, right after backing up to get around an obstacle corner. This back and forth movement may have taken the cart off the intended pathway. Work was stopped and the work team safely exited the work area. The work instructions for this evolution clearly included steps to prevent cords from being in the pathway of the

	dollies. An initial investigation was conducted.
Similar OR Report Number:	1. None.
Facility Manager:	Name: R.A. Trevino Phone: (509) 373-2933 Title: D&D Project Area Manager
Originator:	Name: FEIL, RHONDA K Phone: (509) 373-4551 Title: ADMINISTRATIVE SPECIALIST
HQ OC Notification:	Date: NA; Time: NA; Person Notified: NA; Organization: NA
Other Notifications:	06/28/2011 12:29 (PTZ) ONC MSA 06/28/2011 12:35 (PTZ) R.V. Johnson RL/OOD
Authorized Classifier(AC):	

7)Report Number:	EM-RL--CPRC-SNF-2011-0003 **After 2003 Redesign**
Secretarial Office:	Environmental Management
Lab/Site/Org:	Hanford Site
Facility Name:	Spent Nuclear Fuels Project
Subject/Title:	Electrical Shock to Worker While Securing Garnet Filter Enclosure Lighting at 100K Area
Date/Time Discovered:	06/01/2011 15:30 (PTZ)
Date/Time Categorized:	06/01/2011 16:00 (PTZ)
Report Type:	Update
Report Dates:	Notification 06/02/2011 17:08 (ETZ) Initial Update 07/12/2011 17:13 (ETZ) Latest Update 07/12/2011 17:13 (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 6/1/11, at 1530 Hours, a Nuclear Chemical Operator (NCO) received an electrical shock while manipulating a toggle switch on a lighting control box to secure Garnet Filter Enclosure lighting. The individual was taken to the site medical provider for evaluation, power was isolated, the area was barricaded to prevent further access, and notifications were completed. Update 07/12/11: Submittal of the final occurrence report for this event is extended from 7/14/11 to 7/21/11. Additional time is required to perform a thorough root cause evaluation based on additional information received on the mechanics involved in the switch failure. The responsible RL Facility Representative concurs with this extension.
Cause Description:	
Operating Conditions:	Normal operations.
Activity Category:	Normal Operations (other than Activities specifically listed in this Category)
Immediate Action(s):	1. The worker was taken to the site medical provider for evaluation. 2. Power was isolated. 3. The area was barricaded to prevent further access. 4. Notifications were completed.
FM Evaluation:	The worker was evaluated at the site medical provider immediately following the event and was returned to work without restriction. The facility was placed in a safe condition and access controlled pending completion of the initial incident investigation and completion of actions deemed appropriate prior to release.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	Yes. Before Further Operation? Yes By Whom: facility operations By When: 07/21/2011
Division or Project:	CHPRC/100K Area
Plant Area:	100K Area
System/Building/Equipment:	Garnet Filter Enclosure Lighting Control Box/105 KW Basin
Facility Function:	Nuclear Waste Operations/Disposal
Corrective Action:	
Lessons(s) Learned:	
HQ Keywords:	07D--Electrical Systems - Electrical Wiring 08A--OSHA Reportable/Industrial Hygiene - Electrical Shock 12C--EH Categories - Electrical Safety

	14L--Quality Assurance - No QA Deficiency
HQ Summary:	On June 1, 2011, a nuclear chemical operator (NCO) received an electrical shock while manipulating a toggle switch on a lighting control box to secure Garnet Filter Enclosure lighting. The NCO was taken to the site medical provider for evaluation, power was isolated, the area was barricaded to prevent further access, and management notifications were completed. The NCO was released to return to work with no restrictions.
Similar OR Report Number:	1. None.
Facility Manager:	Name: R. K. Nissen Phone: (509) 373-1178 Title: Manager, K West Facility
Originator:	Name: FEIL, RHONDA K Phone: (509) 373-4551 Title: ADMINISTRATIVE SPECIALIST
HQ OC Notification:	Date: NA, Time: NA, Person Notified: NA, Organization: NA
Other Notifications:	06/01/2011 15:30 (PTZ) R.K. Nissen CHPRC/KB 06/01/2011 15:33 (PTZ) D.H. Splett RL/OOD
Authorized Classifier(AC):	

8)Report Number:	EM-RL--CPRC-SOLIDWASTE-2011-0007 **After 2003 Redesign**
Secretarial Office:	Environmental Management
Lab/Site/Org:	Hanford Site
Facility Name:	Solid Waste Facility
Subject/Title:	Excavator Struck Overhead Light in Weather Enclosure (ARRA)
Date/Time Discovered:	06/27/2011 13:30 (PTZ)
Date/Time Categorized:	06/27/2011 14:15 (PTZ)
Report Type:	Notification
Report Dates:	Notification: 06/29/2011 15:09 (ETZ) Initial Update: Latest Update: Final:
Significance Category:	3
Reporting Criteria:	10(2) - An event, condition, or series of events that does not meet any of the other reporting criteria, but is determined by the Facility Manager or line management to be of safety significance or of concern to other

	facilities or activities in the DOE complex. One of the four significance categories should be assigned to the occurrence, 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 June 22, 2011, a heavy equipment operator was performing excavation inside the weather enclosure at Trench 17 of the 218-E-12B Low Level Burial Ground. As the excavator was emptying material onto the spoil pile, the boom struck an overhead light in the weather enclosure. The light fell onto the spoil pile next to the excavator. The area surrounding the excavator had been barricaded to prevented personnel access in the swing radius. No personnel were in the immediate area at the time the event occurred. During the investigation, management determined that a procedural weakness had contributed to the event. Waste Retrieval had changed to a larger excavator to extend the reach into the trench. When this change occurred, the overhead hazards were not re-evaluated based on the changed equipment. Management determined to issue a management concern occurrence report.
Cause Description:	
Operating Conditions:	Normal Operations
Activity Category:	Normal Operations (other than Activities specifically listed in this Category)
Immediate Action(s):	An investigation was performed. Work using excavators and cranes in the weather enclosure was suspended pending the results of the investigation. The supply breaker to the affected lighting string was locked out.
FM Evaluation:	
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	Yes. Before Further Operation? No By Whom: WRP Operations By When: 08/11/2011
Division or Project:	Waste and Fuels Management Project
Plant Area:	200 East
System/Building/Equipment:	218-E-12B Low Level Burial Ground
Facility Function:	Nuclear Waste Operations/Disposal
Corrective Action:	

Lessons(s) Learned:	
HQ Keywords:	01G--Inadequate Conduct of Operations - Inadequate Procedure 01N--Inadequate Conduct of Operations - Inadequate Job Planning (Other) 05D--Mechanical/Structural - Mechanical Equipment Failure/Damage 08F--OSHA Reportable/Industrial Hygiene - Industrial Operations Issues 08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical) 12G--EH Categories - Industrial Operations 13H--Management Concerns - American Recovery and Reinvestment Act (ARRA) 14D--Quality Assurance - Documents and Records Deficiency 14E--Quality Assurance - Work Process Deficiency
HQ Summary:	On June 22, 2011, the boom of an excavator struck an overhead light while a heavy equipment operator was performing excavation inside the weather enclosure at Trench 17 of the 218-E-12B Low Level Burial Ground. The light fell onto the spoil pile next to the excavator. The area surrounding the excavator had been barricaded to prevent access in the swing radius and no personnel were in the immediate area at the time the event occurred. The supply breaker to the affected lighting string was locked out. During the investigation, management determined that a procedural weakness had contributed to the event. Waste Retrieval had changed to a larger excavator to extend the reach into the trench. When this change occurred, the overhead hazards were not re-evaluated based on the changed equipment.
Similar OR Report Number:	
Facility Manager:	Name: Phillips, Carroll V Phone: (509) 372-2336 Title: Director, Waste Retrieval Project
Originator:	Name: POOLE, M ELIZABETH Phone: (509) 373-0522 Title:
HQ OC Notification:	Date: NA; Time: NA; Person Notified: NA; Organization: NA
Other Notifications:	06/27/2011 13:30 (PTZ) CV Phillips WRP 06/27/2011 14:50 (PTZ) JE Trevino DOE RL 06/27/2011 15:44 (PTZ) N Crary MSA ONC
Authorized Classifier(AC):	

9)Report Number:	EM-RL--CPRC-SOLIDWASTE-2011-0008 **After 2003 Redesign**
Secretarial Office:	Environmental Management

Lab/Site/Org:	Hanford Site
Facility Name:	Solid Waste Facility
Subject/Title:	Electrical Cord Cut During Movement of A Frame Hoist (ARRA)
Date/Time Discovered:	06/30/2011 15:45 (PTZ)
Date/Time Categorized:	06/30/2011 15:56 (PTZ)
Report Type:	Notification
Report Dates:	Notification 07/06/2011 10:36 (ETZ) Initial Update Latest Update Final
Significance Category:	3
Reporting Criteria:	10(2) - An event, condition, or series of events that does not meet any of the other reporting criteria, but is determined by the Facility Manager or line management to be of safety significance or of concern to other facilities or activities in the DOE complex. One of the four significance categories should be assigned to the occurrence, 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:	While moving an A frame hoist at the 218-E-12B Low Level Burial Ground, a 440 volt electrical cable that was coiled on a bracket attached to a cord reel was pulled tight against the framework and was cut, severing some of the conductors. Personnel heard a "pop". After the equipment was placed in a safe condition, personnel noted burn marks on the cable and the metal bracket. All personnel were ten feet away from the A frame at the time the event occurred, and there was no risk of personnel injury. The A Frame was also grounded. Management determined that this issue should be categorized as a Management Concern.
Cause Description:	
Operating Conditions:	Normal Operations
Activity Category:	Normal Operations (other than Activities specifically listed in this Category)
Immediate Action(s):	The equipment was de-energized and tagged out of service. An investigation was initiated.
FM Evaluation:	
DOE Facility Representative Input:	
DOE Program Manager	

Input:	
Further Evaluation is Required:	Yes. Before Further Operation? No By Whom: WRP Operations By When: 08/14/2011
Division or Project:	Waste and Fuels Management Project
Plant Area:	200 East
System/Building/Equipment:	218-E-12B Low Level Burial Ground
Facility Function:	Nuclear Waste Operations/Disposal
Corrective Action:	
Lessons(s) Learned:	
HQ Keywords:	07B--Electrical Systems - Electrical Distribution 08F--OSHA Reportable/Industrial Hygiene - Industrial Operations Issues 08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical) 12C--EH Categories - Electrical Safety 13H--Management Concerns - American Recovery and Reinvestment Act (ARRA) 14E--Quality Assurance - Work Process Deficiency
HQ Summary:	On June 30, 2011, while moving an A-frame hoist at the 218-E-12B Low Level Burial Ground, a 440-volt electrical cable was cut, severing some of the conductors. The cable that was coiled on a bracket attached to a cord reel was pulled tight against the framework when personnel heard a "pop." After the equipment was placed in a safe condition, personnel noted burn marks on the cable and the metal bracket. All personnel were ten feet away from the A-frame at the time the event occurred, and there was no risk of personnel injury. The A-frame was grounded. The equipment was de-energized and tagged out of service and an investigation was initiated.
Similar OR Report Number:	
Facility Manager:	Name: Phillips, Carroll V Phone: (509) 372-2336 Title: Director, Waste Retrieval Project
Originator:	Name: POOLE, M ELIZABETH Phone: (509) 373-0522 Title:
HQ OC Notification:	Date: NA; Time: NA; Person Notified: NA; Organization: NA
Other Notifications:	06/30/2011 15:45 (PTZ) CV Phillips WRP 06/30/2011 16:10 (PTZ) B Wallace DOE RL

	06/30/2011 | 16:35 (PTZ) | K Davis | MSA ONC
Authorized Classifier(AC):	

10)Report Number:	EM-SR--SRR-WVIT-2011-0004 **After 2003 Redesign**
Secretarial Office:	Environmental Management
Lab/Site/Org:	Savannah River Site
Facility Name:	Vitrification Facility
Subject/Title:	Inadequate Lockout/Tagout (L/T) 200/S-11-266 with LTA Determination of Safe Energy State (DSES)
Date/Time Discovered:	06/25/2011 14:45 (ETZ)
Date/Time Categorized:	06/25/2011 14:45 (ETZ)
Report Type:	Notification
Report Dates:	Notification: 06/28/2011 14:02 (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:	No
Occurrence Description:	Electrical and Instrumentation (E&I) Technicians were preparing to replace relay No. 4 for weld test cell door 82. Prior to establishing Lockout/Tagout 200/S-11-266 the technicians discovered induced voltage that required installation of a grounding cluster to mitigate. Lockout/Tagout 200/S-11-266 was established at 1323 following determination of safe energy state. Determination was performed in accordance with Manual 8Q, Procedure 32, but at the L/T boundary rather than the relay work location(less desirable). The grounding cluster was installed without incident and resolved the induced voltage concern. Since the lockout contained warnings that the work was in the vicinity of other energized components, the E&I Technicians elected to test all accessible components within the cabinet and found 120 VAC on the relay to be replaced (relay No. 4).
Cause Description:	

Operating Conditions:	DWPF was operating under normal conditions.
Activity Category:	Maintenance
Immediate Action(s):	Stopped work on weld test cell door 82 relay No. 4. Ensured work area was safe and stable. Management put a hold on all DWPF electrical lockouts until after the fact finding schedule for Monday 6/27/11.
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:	Defense Waste Processing Facility
Plant Area:	S-Area
System/Building/Equipment:	221-S
Facility Function:	Nuclear Waste Operations/Disposal
Corrective Action:	
Lessons(s) Learned:	
HQ Keywords:	01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical) 12I--EH Categories - Lockout/Tagout (Electrical or Mechanical) 14E--Quality Assurance - Work Process Deficiency
HQ Summary:	On June 25, 2011, Electrical and Instrumentation (E&I) Technicians were preparing to replace relay No. 4 for weld test cell door 82, when they discovered 120 VAC on the relay. Prior to establishing Lockout/Tagout 200/S-11-266, the technicians discovered induced voltage that required installation of a grounding cluster to mitigate. Lockout/Tagout 200/S-11-266 was established following determination of safe energy state. Determination was performed in accordance with Manual 8Q, Procedure 32, but at the lockout/tagout boundary rather than at the relay work location. The grounding cluster was installed without incident, which resolved the induced voltage concern. Since the lockout contained warnings that the work was in the vicinity of other energized components, the E&I Technicians elected to test all accessible components within the cabinet and found 120 VAC on the relay to be replaced. Work was stopped and management ensured that the work area was safe and stable. All DWPF electrical lockouts were put on hold until the fact finding meeting was held.
Similar OR Report Number:	
Facility Manager:	Name SONNENBERG, LESLIE K

	Phone: (803) 208-6022 Title: FACILTY MANAGER
Originator:	Name: GREEN, MICHAEL J. Phone: (803) 208-3171 Title: PROGRAM MANAGER C
HQ OC Notification:	Date: NA, Time: NA, Person Notified: NA, Organization: NA
Other Notifications:	06/25/2011 14:45 (ETZ) Steve Wilkerson WT Mgr 06/25/2011 15:02 (ETZ) Patrick Schneider DOps Mgr 06/25/2011 15:09 (ETZ) Bill Barnes DFac Mgr 06/25/2011 15:14 (ETZ) Tom Cochran DOE FRep 06/25/2011 15:17 (ETZ) Tom Occhipinti Engr Mgr 06/25/2011 15:20 (ETZ) Greg Peterson SIRIM 06/25/2011 15:32 (ETZ) John Gall S&H Mgr 06/25/2011 15:36 (ETZ) Mark Sautman DNFSB 06/25/2011 15:40 (ETZ) Dan Burnfield DNFSB 06/25/2011 15:41 (ETZ) David Mills SERB
Authorized Classifier(AC):	

11)Report Number:	FE--NETL-GOPE-NETLMGN-2011-0004 **After 2003 Redesign**
Secretarial Office:	Fossil Energy
Lab/Site/Org:	National Energy Technology Laboratory
Facility Name:	NETL - Morgantown
Subject/Title:	Electrical Voltage Applied to a Motor Rotation Indicator
Date/Time Discovered:	06/19/2011 22:20 (ETZ)
Date/Time Categorized:	06/20/2011 09:00 (ETZ)
Report Type:	Notification/Final
Report Dates:	Notification 06/22/2011 17:16 (ETZ) Initial Update 06/22/2011 17:16 (ETZ) Latest Update 06/22/2011 17:16 (ETZ) Final 06/22/2011 17:16 (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:	A3B1C03 - Human Performance Less Than Adequate (LTA); Skill Based Errors; Incorrect performance due to mental lapse -->couplet - A7B1C01 - Other problem; External Phenomena; Weather or ambient conditions LTA
ISM:	2) Analyze the Hazards
Subcontractor Involved:	Yes Mon-Valley Electric
Occurrence Description:	A power outage was being performed on June 18 and 19, 2011 at the National Energy Technology Laboratory (NETL) Morgantown facility to upgrade some of the old feeder cables that were part of the underground electrical distribution system. The cable replacement was being performed by Mon-Valley Electric Inc., which is a subcontractor to Schuck Construction the prime contractor on this project. The crew performing the work was scheduled to work 16-hour shifts both days. The site power was taken down on the morning of June 18, 2011 at approximately 0600 EDT. Electrical power was maintained to various projects and facilities via back-up or stand-by generators or by electrical feeders that were not in the vicinity where the contractors were working. The site power was kept down until approximately 2200 EDT on June 19, 2011. As part of bringing the site power back up after the outage, a phase sequence test was required to be performed to ensure the new underground feeder connections had been installed properly. The phase sequence test is used to determine the phase sequence (A-B-C or C-B-A) of three-phase voltage systems. It is important that the phase sequence is known prior to energizing electrical motors and other equipment, as incorrect connection could cause damage to site equipment. The Mon-Valley electrician who was going to perform the phase sequence test prepared to do the work by donning insulated gloves with leather protectors, a flash resistant (FR) face shield, leather shoes, and a FR hard hat. The electrician then collected what he thought was a Greenlee Phase Sequence Indicator and connected the clip of the blue lead to the C phase and pressed the white lead to the B phase and the red lead to the A phase. When he did this the instrument he was using failed. The description of the failure was that there was a small pop and a flash approximately equivalent that given by a flashbulb. It was determined that the instrument he used to perform the check was a Greenlee motor rotation indicator rather than the intended Greenlee phase sequence indicator. The motor rotation instrument is not intended to be attached to a live electrical circuit.

	When the electrician attempted to check the phase sequence, there were two electricians from Mon-Valley Electric standing approximately five feet west of the incident site and an NETL electrician standing approximately four feet north of the incident site. There were no injuries sustained by any of the involved individuals.
Cause Description:	The planned 16-hour shift on June 18 ended up being about 18 hours long. The work shift on June 19 also exceeded the 16-hour schedule when the incident occurred. It is believed that the long work hours performed, coupled with dark, rainy conditions and the use of flashlights due to the lack of power, contributed to the incident.
Operating Conditions:	Scheduled electrical outage was occurring.
Activity Category:	Facility/System/Equipment Testing
Immediate Action(s):	The appropriate phase sequence indicator was used subsequent to the incident to determine phase sequence. A safety analysis was also initiated by a safety incident review team.
FM Evaluation:	Upcoming scheduled electrical outages have been scheduled to be initiated Friday evening rather than the originally scheduled Saturday operation. This will allow the contractor and subcontractor to assign personnel to 8-hour shifts rather than the originally scheduled 16-hour shifts.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	No
Division or Project:	Office of Institutional Operations
Plant Area:	Transformer Station
System/Building/Equipment:	B-14
Facility Function:	Balance-of-Plant - Site/outside utilities
Corrective Action:	
Lessons(s) Learned:	The Greenlee motor rotation and phase indicator are sold as a kit with one carrying case. The similarities in appearance between the two units and the single carrying case increase the odds of selecting an inappropriate indicator for the required task. Personnel should not perform the type of work that was scheduled for longer than 12 hours at a time.
HQ Keywords:	01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous) 01Q--Inadequate Conduct of Operations - Personnel error 01R--Inadequate Conduct of Operations - Management 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) 14E--Quality Assurance - Work Process Deficiency 14G--Quality Assurance - Procurement Deficiency
HQ Summary:	On June 19, 2011, a Mon-Valley subcontractor electrician accidentally connected a Greenlee motor rotation indicator to an energized circuit causing the instrument to fail with a pop and flash. The electrician was attempting to perform a phase sequence test as part of bringing site power back up after a power outage to upgrade some of the old feeder cables that were part of an underground electrical distribution system. The phase sequence test was required to ensure the new underground feeder connections had been installed properly. The electrician was supposed to use a Greenlee Phase Sequence Indicator instead of the Greenlee motor rotation indicator, which is not intended to be used on energized circuits. The Greenlee motor rotation and phase indicator are sold as a kit with one carrying case. The similarities in appearance between the two units and the single carrying case increase the odds of selecting an inappropriate indicator for the required task. The electrician was wearing insulated gloves with leather protectors, a flash resistant (FR) face shield, leather shoes, and a FR hard hat. The appropriate phase sequence indicator was used after the incident to determine phase sequence. A safety analysis was also initiated by a safety incident review team. It is believed that long work hours, coupled with dark, rainy conditions and the use of flashlights due to the lack of power, contributed to the incident. There were no injuries.
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: NA; Time: NA; Person Notified: NA; Organization: NA
Other Notifications:	06/19/2011 22:30 (ETZ) Keith Knotts NETL 06/19/2011 23:00 (ETZ) Mike Monahan NETL 06/20/2011 08:30 (ETZ) Bill Lowry NETL
Authorized Classifier(AC):	

12)Report Number:	NA--LASO-LANL-ADOADMIN-2011-0006 **After 2003 Redesign**

Secretarial Office:	National Nuclear Security Administration
Lab/Site/Org:	Los Alamos National Laboratory
Facility Name:	ADO Administration
Subject/Title:	Electrician Drills into Lighting Circuit Conduit
Date/Time Discovered:	06/13/2011 09:20 (MTZ)
Date/Time Categorized:	06/13/2011 15:30 (MTZ)
Report Type:	Notification
Report Dates:	Notification 06/14/2011 16:31 (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:	No
Occurrence Description:	MANAGEMENT SYNOPSIS: On June 13, 2011 at the Radiological Laboratory/Utility/Office Building (RLUOB), at approximately 0920, a Los Alamos National Laboratory (LANL), Materials and Site Services (MSS) Electrician (E1) drilled into an electrical conduit while performing a blind penetration into a gypsum wall. E1 was wearing dielectric gloves and had a Class I Penetration Permit and was working in accordance with the Integrated Work Document (IWD) for the work. E1 was adding a 2" conduit from a cable try in the basement corridor near the elevator into the library. E1 first used a screw driver to probe into the wall from the library side and penetrated the opposite wall. he did not detect the EMT conduit, while probing with the screwdriver, which was located next to the steel stud flush with the edge of the steel stud on the elevator side of the wall. After probing the wall from the library side, E1 moved to elevator side and using a hole saw drilled through two layers of drywall and wire mesh. The pilot bit of the hole saw drilled into the conduit and tripped lighting circuit #5.

	E1 immediately stopped work when the lighting went out and notified his supervisor. The Supervisor (S1) and E1 investigated the area and determined that the lighting circuit had tripped. S1 applied lock out/tag out (LOTO) and immediately made the appropriate notifications. The LANL Electrical Safety Officer (ESO) determined the Electrical Severity score for the event to be 50. The score of 50 is based upon the fact that live conductors were indeed breeched allowing contact via the bit used to core drill the hole causing the breaker feeding the conductors to trip. The electrical severity score was determined using the LANL electrical severity tool. The electrical severity tool rates the electrical severity on a scale of 0 to greater than 310,000. This range provides an exponentially rising severity that, when based on a logarithmic scale, breaks down into four categories of significance, Extreme, High, Medium, and Low. The Electrical Severity score of 50 falls into the Low range. There were no injuries to the worker. A Critique was held at 1500 on June 13, 2011 at which time the Facility Operations Director Designee determined the event to be reportable against ORPS criterion, 2C(2), significance category 3.
Cause Description:	
Operating Conditions:	Startup Operations
Activity Category:	Construction
Immediate Action(s):	-Stand down for all RLUOB MSS electricians. -Direction to MSS and STRs that all Class (Hollow Walls) penetrations are paused.
FM Evaluation:	
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	Yes. Before Further Operation? No By Whom: CAO-PF, RLUOB By When: 08/04/2011
Division or Project:	CMRR RLUOB
Plant Area:	Basement
System/Building/Equipment:	CMRR RLUOB
Facility Function:	Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)

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) 07D--Electrical Systems - Electrical Wiring 12C--EH Categories - Electrical Safety 14D--Quality Assurance - Documents and Records Deficiency 14E--Quality Assurance - Work Process Deficiency
HQ Summary:	On June 13, 2011, a Materials and Site Services (MSS) electrician drilled into an electrical conduit at the Radiological Laboratory/Utility/Office Building (RLUOB) while performing a blind penetration into a gypsum wall. The electrician was wearing dielectric gloves and had a Class I Penetration Permit and was working in accordance with the Integrated Work Document (IWD) for the work. The electrician was adding a 2-inch conduit from a cable tray in the basement corridor near the elevator into the library. He first used a screw driver to probe into the wall from the library side and penetrated the opposite wall and did not detect the metal conduit, which was located next to the steel stud, flush with the edge of the steel stud on the elevator side of the wall. After probing the wall from the library side, the electrician moved to elevator side and used a hole saw to drill through two layers of drywall and wire mesh. The pilot bit of the hole saw drilled into the conduit and tripped the circuit breaker for lighting circuit #5 causing the lights to go out. The electrician immediately stopped and notified his supervisor. The Supervisor applied a lockout/tagout and immediately made the appropriate notifications. A stand down for all RLUOB MSS electricians was initiated and a critique was held.
Similar OR Report Number:	1. NA--LASO-LANL-ADOADMIN-2011-0004
Facility Manager:	Name: Richard Holmes Phone: (505) 606-2394 Title: Facility Operations Director
Originator:	Name: WATERS, MARTHA D. Phone: (505) 606-0277 Title: OCCURRENCE INVESTIGATOR
HQ OC Notification:	Date: NA; Time: NA; Person Notified: NA; Organization: NA
Other Notifications:	Date: 06/13/2011; Time: 12:00 (MTZ); Person Notified: Ed Christie; Organization: DOE/LASO
Authorized Classifier(AC):	Martha D. Waters Date: 06/14/2011

13)Report Number:	NA--LASO-LANL-ADOADMIN-2011-0007 **After 2003 Redesign**
Secretarial Office:	National Nuclear Security Administration
Lab/Site/Org:	Los Alamos National Laboratory
Facility Name:	ADO Administration
Subject/Title:	Welding Inspector Receives an Electrical Shock During Weld Inspection
Date/Time Discovered:	06/16/2011 11:15 (MTZ)
Date/Time Categorized:	06/16/2011 13:14 (MTZ)
Report Type:	Notification
Report Dates:	Notification 06/17/2011 18:34 (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:	Yes JB Henderson and Yearout Mechanical
Occurrence Description:	MANAGEMENT SYNOPSIS: On June 16, 2011, at 1115, a CMRR welding inspector (WI) received an electrical shock to both of his hands and arms as he touched a conduit while moving a jack-stand which came in contact with a unistrut during inspection of a weld at Technical Area 55, Building 400. The WI stated that he felt a tingling sensation from his fifth finger to his elbow on both of his hands and arms. He immediately notified the person-in-charge (PIC) and a group of Henderson subcontractor welders working approximately forty (40) feet away from him. The Henderson welders paused their work and barricaded their work area. The WI then notified the electrical safety officer of the event. At 1133, an MSS carpenter transported the WI to the Laboratory's occupational medicine facility (OMF) for evaluation. Laboratory medical personnel conducted two EKGs of the WI with normal results. Following his evaluation, medical personnel scheduled the WI for a follow-up evaluation on June 17, 2011, and then released the WI to work with no restrictions.
Cause Description:	
Operating Conditions:	Welding Inspection Activities

Activity Category:	Inspection/Monitoring
Immediate Action(s):	1. An MSS carpenter transported the WI to the OMF for evaluation. Following his evaluation, Laboratory medical personnel scheduled the WI for a follow-up evaluation on June 17, 2011, and then released the WI to work with no restrictions. 2. A CMRR ESO began testing the facility's electrical system to determine the source of the shock. The ESO checked for voltage potential between the conduit and the unistrut and found zero voltage between those locations. He also ran a continuity check between those locations and ground. This check confirmed continuity to ground. 3. The CMRR Division management paused all work activities in the facility pending further review. Work activities, except for welding activities, were resumed on June 17, 2011. 4. A safety briefing outlining what was known about the event at the time was held at 2:00 p.m. on the day of the event. 5. A critique was held at 3:15 on the day of the event.
FM Evaluation:	
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	Yes. Before Further Operation? No By Whom: CMRR-DO & CAO-PF By When: 07/21/2011
Division or Project:	CMRR
Plant Area:	TA-55-400
System/Building/Equipment:	Radioactive Liquid Waste Piping
Facility Function:	Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)
Corrective Action:	
Lessons(s) Learned:	
HQ Keywords:	08A--OSHA Reportable/Industrial Hygiene - Electrical Shock 11G--Other - Subcontractor 12C--EH Categories - Electrical Safety 14L--Quality Assurance - No QA Deficiency
HQ Summary:	On June 16, 2011, a CMRR welding inspector, during inspection of a weld at Technical Area 55, Building 400, received an electrical shock to both of

	his hands and arms as he touched a conduit while moving a jack-stand, which touched a section of unistrut. The inspector stated that he felt a tingling sensation from his fifth finger to his elbow on both of his hands and arms. He immediately notified the person-in-charge and a group of Henderson subcontractor welders working approximately 40 feet away from him. The Henderson welders stopped their work and barricaded their work area. The inspector then notified the electrical safety officer of the event. The inspector was transported to the Laboratory's occupational medicine facility for evaluation. Laboratory medical personnel conducted two EKGs that had normal results. The inspector returned to work with no restrictions. A CMRR electrical safety officer (ESO) tested the facility's electrical system to determine the source of the shock. The ESO checked for voltage potential between the conduit and the unistrut and found zero voltage between those locations. He also ran a continuity check between those locations and ground. This check confirmed continuity to ground. A critique was held.
Similar OR Report Number:	
Facility Manager:	Name: William Wagner Phone: (505) 664-0012 Title: CMRR Facility Operations Director Designee
Originator:	Name: KIRSCH, MICHELLE M Phone: (505) 665-8146 Title: OCCURRENCE INVESTIGATOR
HQ OC Notification:	Date: NA; Time: NA; Person Notified: NA; Organization: NA
Other Notifications:	06/16/2011 12:39 (MTZ) Notification Hotline LASO 06/16/2011 14:00 (MTZ) Art Trujillo LASO
Authorized Classifier(AC):	Linda Collier Date: 06/17/2011

14)Report Number:	SC--PNSO-PNNL-PNNLBOPER-2011-0006 **After 2003 Redesign**
Secretarial Office:	Science
Lab/Site/Org:	Pacific Northwest National Laboratory
Facility Name:	Energy Research Programs (PNNL)
Subject/Title:	Vendor Noncompliance with Hazardous Energy Controls
Date/Time Discovered:	06/01/2011 16:00 (PTZ)
Date/Time Categorized:	06/02/2011 09:00 (PTZ)
Report Type:	Final

Report Dates:	Notification 06/06/2011 13:08 (ETZ) Initial Update 07/15/2011 17:37 (ETZ) Latest Update 07/15/2011 17:37 (ETZ) Final 07/15/2011 17:37 (ETZ)
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:	A3B2C01 - Human Performance Less Than Adequate (LTA); Rule Based Error; Strong rule incorrectly chosen over other rules -->couplet - NA A3B2C03 - Human Performance Less Than Adequate (LTA); Rule Based Error; Too much activity was occurring and error made in problem solving -->couplet - NA A3B2C05 - Human Performance Less Than Adequate (LTA); Rule Based Error; Situation incorrectly identified or represented results in wrong rule used -->couplet - NA A5B4C01 - Communications Less Than Adequate (LTA); Verbal Communications LTA; Communication between work groups LTA
ISM:	4) Perform Work Within Controls
Subcontractor Involved:	Yes Otis Elevator Co.
Occurrence Description:	On Wednesday, June 1, 2011, two vendor technicians on site for training inappropriately performed trouble shooting on a 3425 Building elevator, opening a 480-Volt electrical panel without following PNNL hazardous energy control procedures. On Thursday, June 2, 2011, the incident was reported to the Building Manager (BM) who determined the event was reportable under criteria 2C(2), SC-3.
Cause Description:	The recently constructed 3425 Building has been operational since June 2010. Lydig-Grant is the general contractor for construction and subcontracted with Otis Elevator for the installation, emergency call response and warranty work for the 3425 elevator required within the first year of operation. On May 25, 2011 and May 31, 2011, requests were made by PNNL to Lydig-Grant for repairs needed on the elevator. PNNL requested that repairs be made by June 2, 2011, to support operational needs within the facility. Training requirements, however, caused this date to be slipped to June 3, 2011.

	Due to expired badges and training, Lydig-Grant requested that Otis Elevator contact the PNNL Construction Coordinator to renew badges and schedule the training required which included Lock and Tag gap, Electrical Safety, and 3425 Building Orientation training. Lock and Tag gap training was scheduled for June 1, 2011, and Electrical Safety training was originally scheduled for June 2, 2011. On June 1, 2011, the two Otis Elevator technicians arrived onsite, picked up their badges, completed 3425 Orientation Training, and attended Lockout/Tagout gap training. Immediately following completion of Lock and Tag training, both Otis Elevator technicians traveled to the 3425 Building to expedite the elevator services requested to be completed by June 2, 2011. The technicians performed initial trouble-shooting by opening the elevator control cabinet in order to review LED trouble-indicators located inside the control panel. (If power is disconnected prior to reviewing the control panel, the trouble codes cannot be retrieved.) The control panel contains 24-Volt for the LED display and 120-Volt and 480-Volt electrical conductors. The Otis Elevator technicians placed an electrical insulating blanket over the 480-Volt drive located on the left side of the control panel as the door was partially open and could not be latched while the right side was open to see the LED panel. After viewing the LED indicators, the Otis Elevator technicians shut off power to the control panel but did not apply lock and tag to control the electrical disconnect. A 3425 Building Power Operator responded to a system alarm and saw the Otis Elevator technicians working in the open energized panel. The Power Operator told the technicians that they could not have the panel door open. The Power Operator contacted the Building Engineer regarding the work being performed. The Building Engineer talked with the Otis Elevator technicians and requested that they stop work until training was complete and an Energized Electrical Work Permit (EEWP) was developed. However, the Building Engineer did not contact the Building Manager or the PNNL Operations Center to report the event so that it could be evaluated and categorized in a timely manner. An EEWP was initiated by the Safety and Health Representative in anticipation of work to be performed on June 3, 2011. The apparent cause for this event was task performance error. The Otis Elevator technicians understood PNNL's original desire to restore service to the elevator by June 2, 2011 (a new due date had been set for June 3, 2011 based on slippage caused by the training requirements) and thought that it might easily be accomplished once they identified the failure. However, in an attempt to quickly troubleshoot or restore service to the elevator, neither technician complied with multiple known requirements while performing work including: A3B2C01 - Human Performance LTA | Rule Based Error | Strong rule incorrectly chosen over other rules

Performing energized electrical work without the appropriate controls in place: Both Otis Elevator technicians had previous experience with PNNL Electrical Safety requirements and EEWPs for diagnostic and testing or de-energizing electrical equipment as they were required to use them during construction and installation of the elevator. Based on the co-location of the 24-Volt LED display inside of the control panel with higher voltage electrical conductors, an EEWP is required when the panel needs to be accessed to view error indicators or to perform diagnostic and testing/de-energizing of the panel. Still, although the Otis Elevator technicians had not completed their Electrical Safety training, they believed that they could look at the elevator and perform trouble-shooting. (See action #1, 2 & 5.)

A3B2C03 - Human Performance LTA | Rule Based Error | Too much activity was occurring and error made in problem solving

Performing electrical work without current Electrical Safety Training: The required Electrical Safety Training, Course 1014/2000, had expired for both Otis Elevator technicians. The Electrical Safety training scheduled for June 2, 2011 was required to be completed prior to performing electrical work and service to the elevator was contingent upon its completion. (See action #2 & 5.)

A3B2C05 - Human Performance LTA | Rule Based Error | Situation incorrectly identified or represented resulting in wrong rule used

Not applying lock and tag to the electrical disconnect: The Otis Elevator technicians did not follow PNNL lock and tag requirements included in the training they had just completed. After leaving the lock and tag training, the technicians entered the 3425 Building and de-energized the control panel with the electrical disconnect. Even though the Otis Elevator technicians had not completed their PNNL training (that is, Electrical Safety training remained to be completed), they believed that they could look at the elevator and perform trouble-shooting. In addition, the technicians did not apply their Authorized Worker locks and tags but chose to control the electrical disconnect visually which is inconsistent with PNNL's hazardous energy program. (See action #1, 2 & 5.)

A5B4C01 - Communications LTA | Verbal Communications Not Used | Communications between work groups LTA

Not reporting to the Lydig-Grant field-office trailer prior to the start of work: Lydig-Grant has a long standing procedure that all subcontractors are to stop at their construction field-office trailer and sign the log prior to the start of work. This procedure allows Lydig-Grant to be aware of what

	subcontractors are on-site, what work is being performed, and coordinate activities with PNNL staff, as required. This procedure has been in place and utilized by Otis Elevator previously during installation and other warranty work performed. Lydig-Grant was not aware that the technicians were at the 3425 Building or that work was being performed because Otis Elevator did not communicate their work schedule, nor did they sign in at the trailer, as required. Had they followed this standing protocol, they would have been informed of the due date extension prompted by the training requirements and would have been stopped from performing the work until their training was completed. The June 2, 2011, onsite arrival was the second instance that the lead Otis Elevator technician had not contacted Lydig-Grant when arriving onsite. During the critique, the lead Otis Elevator technician stated that he responded to an emergency call from the 3425 elevator on May 17, 2011 to release stranded passengers. The lead Otis Elevator technician stated that he reported directly to the 3425 Building without checking in at the Lydig-Grant trailer nor did he call Lydig-Grant regarding his arrival onsite to perform work. (See action #3.)
Operating Conditions:	Indoor, dry
Activity Category:	Maintenance
Immediate Action(s):	The Building Engineer (BE) was contacted at the time of discovery and directed the technicians to stop work. The vendor was instructed to not perform any work activities in PNNL facilities until further investigation is complete. The panel was secured and the BM was notified the next day. There was no contact with hazardous electrical energy and there were no injuries. A critique of the event was held on Friday, June 3, 2011.
FM Evaluation:	There was no contact with hazardous energy and no impact to workers. There was little impact to the facility or R&D programs. When the original requested date of June 2 slipped to June 3 due to retraining requirements, arrangements were made to transport smaller quantities of needed materials and staff using the stairs. Results of the Electrical Severity calculations for this event: EHF)*[(1+EF+SPF+AFPF+TPF)*IF]=ES EHF (Electrical Hazard Factor) = 50 EF (Environmental Factor) = 0 SPF (Shock Proximity Factor) = 1 AFPF (Arc Flash Proximity Factor) = 0 TPF (Thermal Proximity Factor) = 0 IF (Injury Factor) = 1 (50)*[(1+0+1+0+0)*1] = 100 Medium Severity

	Review of Similar Occurrences (see Item 37): SC--PNSO-PNNL-PNNLBOPER-2008-0019 and Critique Report This occurrence was similar in that the electrician did not "check in" prior to starting work, but this was due ore to the workers interpretation of what constituted performing work "on the site" troubleshooting was performed on the construction field office trailer and not in one of the buildings under construction). Also, there were some communications problems between the various layers of contractors and subcontractors not experienced in this latest occurrence. But, it was similar in that there were some perceived schedule pressures by the technicians onsite, even though the completion date had been adjusted due to the delays caused by the retraining requirements. SC--PNSO-PNNL-PNNLBOPER-2010-0019 and Critique Report This occurrence was similar in that the equipment technician believed it was okay to remove panels and work near high voltage components that are considered finger-safe during troubleshooting. This, however, was part of his company's training and through communications inadequacies, the technician had not received PNNL training prior to the start of work; whereas, the Otis Elevator technicians had. Following this event, the contract with Otis Elevator was terminated two weeks early of its expiration date. The decision to terminate and contract with another elevator service provider was due to the lack of appropriate management response on behalf of Otis Elevator to PNNL's concern regarding the workers disregard for multiple requirements while performing onsite work. Once the contract was terminated, the emergency call for the 3425 elevator was reprogrammed to the PNNL Operations Center consistent with other elevators throughout the campus.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	No
Division or Project:	Strategic Projects Division / Operational Systems
Plant Area:	PNNL Site
System/Building/Equipment:	3425 Bldg Elevator
Facility Function:	Laboratory - Research & Development
Corrective Action 01:	**Target Completion Date:**06/06/2011 **Tracking ID:**00406.1

	Lydig-Grant will contact Otis Elevator to inform them that Lockout/Tagout re-training is required for both technicians, and that work will not be performed until the course has been repeated.
Corrective Action 02:	**Target Completion Date:**06/27/2011 **Tracking ID:**00406.6
	Lydig-Grant will communicate to Otis Elevator that they are not allowed on site for any further work associated with Contract No. 62217. Another qualified vendor will perform repairs.
Corrective Action 03:	**Target Completion Date:**06/15/2011 **Tracking ID:**00406.3
	Lydig-Grant will communicate with all subcontractors reiterating the requirement to check in at the Lydig-Grant trailer prior to starting work at PNNL.
Corrective Action 04:	**Target Completion Date:**06/23/2011 **Tracking ID:**00406.4
	Work with the DOE Regulatory Compliance Program Manager to determine electrical noncompliance and if the event is NTS reportable.
Corrective Action 05:	**Target Completion Date:**06/10/2011 **Tracking ID:**00406.7
	Reprogram PSF facility elevator trouble alarms to the PNNL Control Room and schedule any further maintenance with another qualified vendor.
Corrective Action 06:	**Target Completion Date:**07/29/2011 **Tracking ID:**00406.8
	Discuss with the Building Engineer the importance of reporting event to the Operations Center and Building Manager to initiate prompt reporting and categorization of events.
Lessons(s) Learned:	A vendors desire to meet or exceed perceived customer expectations can influence decision making regarding compliance with requirements. This desire to satisfy, coupled with varying standards in external industry for compliance with electrical safety requirements for visual inspection of electrical components can create an opportunity for unsafe behavior and actions in our more rigorous environment. Continued clear communications with external vendors regarding expectations for rigorous compliance with requirements is a must.
HQ Keywords:	01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical) 11L--Other - Supplier 12I--EH Categories - Lockout/Tagout (Electrical or Mechanical) 14E--Quality Assurance - Work Process Deficiency 14G--Quality Assurance - Procurement Deficiency
HQ Summary:	On June 1, 2011, two vendor technicians, who were onsite for training, inappropriately performed troubleshooting on an elevator in the 3425 Building and opened a 480-volt electrical panel without following PNNL hazardous energy control procedures. The building engineer was contacted

	at the time of discovery and directed the technicians to stop work. The vendor was instructed not to perform any work in PNNL facilities until further investigation is completed. The panel was secured and the building manager was notified on June 2. There was no contact with hazardous electrical energy and there were no injuries. A critique of the event was held.
Similar OR Report Number:	1. SC--PNSO-PNNL-PNNLBOPER-2008-0019
	2. SC--PNSO-PNNL-PNNLBOPER-2010-0019
Facility Manager:	Name: Pittman, J. P. Phone: (509) 371-7056 Title: Project Manager, Physical Sciences Facility Constr
Originator:	Name: POLLARI, ROGER A Phone: (509) 371-7700 Title:
HQ OC Notification:	Date: NA; Time: NA; Person Notified: NA; Organization: NA
Other Notifications:	Date: 06/02/2011; Time: 10:15 (PTZ); Person Notified: Christ, Josef; Organization: PNSO
Authorized Classifier(AC):	Pollari, R. A. Date: 07/15/2011

15)Report Number:	SC--PNSO-PNNL-PNNLBOPER-2011-0008 **After 2003 Redesign**
Secretarial Office:	Science
Lab/Site/Org:	Pacific Northwest National Laboratory
Facility Name:	Energy Research Programs (PNNL)
Subject/Title:	Discovery of Uncontrolled Hazardous Energy Source (120V)
Date/Time Discovered:	06/24/2011 13:35 (PTZ)
Date/Time Categorized:	06/24/2011 15:06 (PTZ)
Report Type:	Notification
Report Dates:	Notification: 06/28/2011 15:38 (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:	5) Provide Feedback and Continuous Improvement
Subcontractor Involved:	No
Occurrence Description:	On Friday, June 24, 2011, at approximately 1345 hours, during an activity to verify the identity and location of thermocouples connected from a data logging computer to six forced air convection heating ovens in lab 202 at the Applied Process Engineering Laboratory (APEL), it was discovered that one thermocouple (TC) was broken. The researcher attempted to extract the broken end of the TC from the oven using a pliers, but could only pull it out a short distance. After determining it was stuck, he used a diagonal cutter to cut off the end that was sticking out of the oven. When he cut the TC, a spark was observed between the cutter and the casing. The researcher was not shocked. The researcher immediately turned the oven off and locked and tagged the plug. Both the pliers and cutters had insulating handles.
Cause Description:	
Operating Conditions:	Laboratory - dry conditions
Activity Category:	Research
Immediate Action(s):	The researcher called the PNNL Single Point of Contact (375-2400) to report the event. He then opened the oven and observed that the thermocouple had been incorrectly routed through the ventilation port inside the oven, and was located near the heating elements instead of inside the sample chamber. The sample chamber is physically separated from the heating elements by a sheet metal barrier, but the side ventilation port provides access to both via a screened grating. Closer examination revealed that the thermocouple had welded itself to a heating element. A qualified electrical worker took apart the oven to examine it. He determined the voltage going to the heating elements was 120VAC. This constitutes the discovery of an uncontrolled hazardous energy source.
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:	Energy and Environment Directorate
Plant Area:	RCHN Area

System/Building/Equipment:	APEL/Lab 202
Facility Function:	Laboratory - Research & Development
Corrective Action:	
Lessons(s) Learned:	
HQ Keywords:	01S--Inadequate Conduct of Operations - Incorrect/Inadequate Installation 04A--Instrumentation and Controls - I & C Equipment 08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical) 12C--EH Categories - Electrical Safety 14E--Quality Assurance - Work Process Deficiency
HQ Summary:	On June 24, 2011, during an activity to verify the identity and location of thermocouples connected from a data logging computer to six forced air convection heating ovens in laboratory 202 at the Applied Process Engineering Laboratory, a spark was observed. During the verification activity, one thermocouple (TC) was discovered to be broken. The researcher attempted to extract the broken end of the TC from the oven using pliers, but could only pull it out a short distance. After determining it was stuck, he used a diagonal cutter to cut off the end that was sticking out of the oven. When he cut the TC, a spark was observed between the cutter and the casing. The researcher was not shocked. The researcher immediately turned the oven off and locked and tagged the plug. Both the pliers and cutters had insulating handles. The thermocouple had been incorrectly routed through the ventilation port inside the oven and had welded itself to a heating element. A qualified electrical worker took apart the oven to examine it and determined that the voltage going to the heating elements was 120VAC.
Similar OR Report Number:	
Facility Manager:	Name: Johnson, B. R. Phone: (509) 372-1635 Title: Manager, Radiological Matl's & Tech Dev
Originator:	Name: POLLARI, ROGER A Phone: (509) 371-7700 Title:
HQ OC Notification:	Date: NA; Time: NA; Person Notified: NA; Organization: NA
Other Notifications:	Date: 06/24/2011; Time: 15:06 (PTZ); Person Notified: Carlson, J. L.; Organization: PNSO
Authorized Classifier(AC):	Pollari, R. A. Date: 06/28/2011

16)Report Number:	SC--SSO-SU-SLAC-2011-0009 **After 2003 Redesign**
Secretarial Office:	Science

Lab/Site/Org:	Stanford Linear Accelerator Center
Facility Name:	Stanford Linear Accelerator Center
Subject/Title:	Electrical Shock First Aid From Exposed Electrical Contact
Date/Time Discovered:	06/09/2011 11:50 (PTZ)
Date/Time Categorized:	06/09/2011 15:15 (PTZ)
Report Type:	Notification
Report Dates:	Notification 06/10/2011 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:	No
Occurrence Description:	An Accelerator Directorate (AD) technician received a shock from exposed 110v terminals on a piece of equipment built by a group outside of SLAC. This occurred at Test Stand 2, in Klystron Test Lab. The worker is from the Accelerator Research Division (AARD). The electrical equipment was non-listed (i.e., no label from a Nationally Recognized Testing Laboratory) and had not gone through the Electrical Equipment Inspection Program (EEIP) review. The technician was evaluated by SLAC Occupational Health Center and cleared to return to work (First Aid only).
Cause Description:	
Operating Conditions:	Does not apply.
Activity Category:	Normal Operations (other than Activities specifically listed in this Category)
Immediate Action(s):	Equipment was immediately taken out of service for inspection by the Electrical Safety Officer. Affected person was take to Medical and an Investigation initiated.
FM Evaluation:	
DOE Facility Representative Input:	
DOE Program Manager	

Input:	
Further Evaluation is Required:	Yes. Before Further Operation? No By Whom: Electrical Safety Officer By When:
Division or Project:	Accelerator Directorate
Plant Area:	Building 044
System/Building/Equipment:	Klystron Test Lab - Building 044
Facility Function:	Accelerators
Corrective Action:	
Lessons(s) Learned:	
HQ Keywords:	01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control 07D--Electrical Systems - Electrical Wiring 08A--OSHA Reportable/Industrial Hygiene - Electrical Shock 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 14H--Quality Assurance - Inspection and Acceptance Testing Deficiency
HQ Summary:	On June 9, 2011, an Accelerator Directorate technician received an electrical shock from exposed 110-volt terminals on a piece of equipment. The equipment was built by a group outside of SLAC. This electrical shock occurred at Test Stand 2, in the Klystron Test Lab. The electrical equipment was non-listed (i.e., no label from a Nationally Recognized Testing Laboratory) and had not gone through the SLAC Electrical Equipment Inspection Program review. The technician was evaluated by the SLAC Occupational Health Center and cleared to return to work. Management notifications were made. The equipment was immediately taken out of service for inspection by the Electrical Safety Officer. An investigation was initiated.
Similar OR Report Number:	
Facility Manager:	Name: LOUGEE, LAWRENCE Phone: (650) 926-2997 Title: FACILITY MANAGER DESIGNEE
Originator:	Name: JOHNSON, HOPE E Phone: (650) 926-4322 Title: FACILITY MANAGER ADMIN.
HQ OC Notification:	Date: NA; Time: NA; Person Notified: NA; Organization: NA

Other Notifications:	

Date	Time	Person Notified	Organization
06/09/2011	12:10 (PTZ)	Lance Lougee	SLAC
06/09/2011	12:35 (PTZ)	Donald Wilhelm	SSO DOE
06/09/2011	12:35 (PTZ)	Tom Rizzi	SSO DOE

Authorized Classifier(AC):	