

August 2007 Electrical Safety Occurrences

There were 15 electrical safety occurrences for August 2007:

- 5 resulted in shocks to a worker (an increase over last month)
- 1 involved an arc flash
- 1 involved excavation
- 3 involved cutting conduit and electrical cords
- 2 involved lockout/tagout
- 4 involved electrical workers and 11 involved non-electrical workers
- 2 involved subcontractors

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),

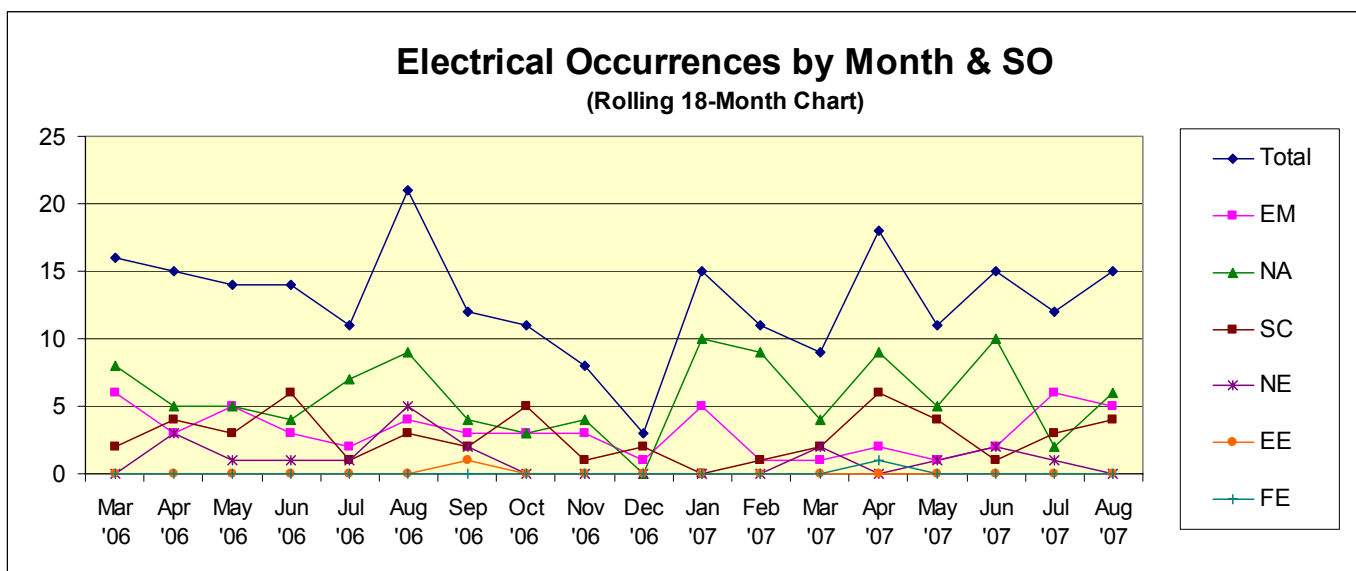
08A – Electrical Shock, 08J – Near Miss (Electrical), 12C – Electrical Safety

The initial search yielded 15 occurrences and a review of these determined none needed to be culled out.

Below is the current summary of 2007 electrical safety occurrences:

Period	Electrical Safety Occurrences	Shocks	Burns	Fatalities
Jan-07	15	1	0	0
Feb-07	11	3	0	0
Mar-07	9	1	0	0
Apr-07	18	3	1	0
May-07	11	1	0	0
Jun-07	15	5	0	0
Jul-07	12	3	1	0
Aug-07	15	5	0	0
2007 total	106 (avg. 13.3/month)	22	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 average rate of electrical safety occurrences in 2007 is now 13.3 per month, which remains less than the average rate of 13.8 per month experienced in 2006.



Electrical Safety Occurrences – August 2007

No	Report Number	Subject/Title	EW ⁽¹⁾	N-EW ⁽²⁾	SUB ⁽³⁾	SHOCK	BURN	ARCF ⁽⁴⁾	LOTO ⁽⁵⁾	EXCAV ⁽⁶⁾	CUT/D ⁽⁷⁾	VEH ⁽⁸⁾
1	EM-RL--PHMC-FSS-2007-0011	Hazardous Energy Control Error, Building 712	X						X			
2	EM-RL--PHMC-TPLANT-2007-0004	Construction Worker Experiences Minor Electrical Shock During Piping Inspection		X		X						
3	EM-RL--PHMC-WESF-2007-0001	Energized Lead Found During Facility Modification	X									
4	EM-RP--BNRP-RPPWTP-2007-0015	Power Cord Pulled from Male Cord Cap		X							X	
5	EM-SR--WSRC-SUD-2007-0004	Fuses Failed to Operate as Designed on 13.8 KV Electrical Distribution System	X									
6	NA--KCSO-AS-KCP-2007-0008	Minor Electrical Shock from Damaged Fluorescent Light Clip		X		X						
7	NA--KCSO-AS-KCP-2007-0011	Accidental Core Drilling into an Embedded Electrical Conduit		X							X	
8	NA--LSO-LLNL-LLNL-2007-0038	Mild electrical shock while plugging in soldering iron in Building 231		X		X						
9	NA--SS-SNL-1000-2007-0015	Miswired Battery Charger Melts Wires		X	X							
10	NA--SS-SNL-5000-2007-0003	Employee Cut an Energized Power Cord in Bldg. 962		X							X	
11	NA--SS-SNL-CASITE-2007-0004	B968 Chiller Pump Replacement		X					X			
12	SC--ASO-ANLE-ANLEAPS-2007-0003	Employee Reports Electrical Shock While Plugging Power Adaptor Into Surge Suppressor		X		X						
13	SC--FSO-FNAL-FERMILAB-2007-0006	Transformer Arc Flash	X					X				
14	SC--PNSO-PNNL-PNNLBOPER-2007-0009	Damaged Direct-Buried 277V Cable Encountered During Sprinkler Repair		X	X					X		
15	SC--SSO-SU-SLAC-2007-0009	Employee Receives Mild Sensation at Stanford Synchrotron Radiation Laboratory (SSRL)		X		X						
	TOTAL		4	11	2	5		1	2	1	3	

Key

(1)EW = electrical worker, (2)N-EW = non-electrical worker, (3)SUB = subcontractor, (4)ARCF = significant arc flash, (5)LOTO = lockout/tagout, (6)EXCAV = excavation, (7)CUT/D = cutting or drilling, (8)VEH = vehicle event

ORPS Operating Experience Report

Production GUI - New ORPS

ORPS contains 53607 OR(s) with 56925 occurrences(s) as of 2/19/2008 12:21:46 PM
Query selected 15 OR(s) with 15 occurrences(s) as of 2/19/2008 3:24:42 PM

Download this report in Microsoft Word format. 

1)Report Number:	EM-RL--PHMC-FSS-2007-0011 After 2003 Redesign		
Secretarial Office:	Environmental Management		
Lab/Site/Org:	Hanford Site		
Facility Name:	Facility & Site Services		
Subject/Title:	Hazardous Energy Control Error, Building 712		
Date/Time Discovered:	08/22/2007 15:30 (PTZ)		
Date/Time Categorized:	08/22/2007 15:45 (PTZ)		
Report Type:	Final		
Report Dates:	Notification	08/23/2007	19:58 (ETZ)
	Initial Update	09/28/2007	04:12 (ETZ)
	Latest Update	09/28/2007	04:12 (ETZ)
	Final	09/28/2007	04:12 (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:	A3B3C05 - Human Performance Less Than Adequate (LTA); Knowledge Based Error; Incorrect assumption that a correlation exists between two or more facts -->couplet - A4B1C01 - Management Problem; Management Methods Less Than Adequate (LTA); Management policy guidance / expectations not well-defined, understood or enforced		
ISM:	3) Develop and Implement Hazard Controls		
Subcontractor Involved:	No		
Occurrence Description:	SUMMARY: On August 15, 2007, an Electrician was assigned to replace plug-in emergency lighting in Building 712 and as a late change, to re-lamp a string of six fluorescent ceiling fixtures with many non-working lamps. The 6-light string crossed the facility between two doors.		

After the lamps were replaced, two of the fixtures on the ends of the string still would not light. The Electrician turned off Breaker 26, saw the four center lights turn off, and assumed the two end ballasts should be replaced.

The Electrician returned to the Controlling Organization/ Maintenance Supervisor for the Eight-Criteria Checklist required for this work, which the Supervisor completed using the Electrician's description and the Panel Schedule as a reference.

The Electrician locked out the indicated single power source at Breaker 26, completed the Safe-To-Work Check, and changed the ballasts. On restoring the circuit, the Electrician found that the two end-lights still would not light and notified the Controlling Organization Supervisor.

Troubleshooting was interrupted by a large wild land fire that swept across the site. When troubleshooting resumed the following week, a drawing review and facility walk-down identified that the two non-working lights were on Circuit 36, which was open. The lockout/ tagout error was determined following a critique meeting the next day.

No injury occurred to the Electrician because Breaker 36 was open and the panel Caution Tagged to prevent closing open breakers, and the Electrician was wearing PPE. The Electrician made an incorrect assumption after a series of work evolutions involving this panel and light string. Had the Electrician performed a check for positive energy at the end-lights, the absence of electricity to these ballasts would have indicated a different circuit. Another factor was that Management Expectations did not reinforce the importance of identifying the lockout/ tagout boundary using any means necessary when completing an Eight-Criteria Checklist.

NARRATIVE:

When all the lamps were replaced, the Electrician closed Breaker 26 and the four light fixtures in the middle of the string worked, but the two fixtures at either end of the string did not. The Panel Schedule did not clearly show that these lights were on a different breaker (Breaker 26 was labeled "vault lights isle 7 south"). The Electrician did not check for electricity at the ballasts and could not troubleshoot by checking any of the open breakers because of the Caution Tag.

In accordance with the work package requirement to check with the Controlling Organization before changing a ballast, the Electrician went back to the Controlling Organization/ Maintenance Supervisor to discuss energy isolation. Hanford site procedure HNF-PRO-081 "Lockout/ Tagout"

allows the use of an Eight-Criteria Checklist when the eight criteria are met, including a single energy source that can be readily identified and isolated.

The Maintenance Supervisor at the 2266E Building completed an "Eight-Criteria Checklist" with the Panel Schedule and the Electrician's recent experience with Circuit 26 for reference. The Checklist identified Breaker 26 as the single source of power for this light string. Returning to Building 712, the Electrician opened and isolated Circuit 26 using an Authorized Worker Lock (AWL). [Building 712 is in Richland and Building 2266E is greater than 20 miles away in 200 East.]

The Electrician completed the Safe-To-Work Check and replaced the ballasts, restored the circuit, and discovered the two fixtures still would not light. The Electrician notified the Controlling Organization/ Supervisor who determined that a walk-down and troubleshooting were necessary. The Maintenance Supervisor notified the Facility Manager, and work was suspended on the 16th because of the site wild land fire (EM-RL--PHMC-FSS-2007-0010 "Range Fire on the Hanford Site and Arid Lands Ecology Reserve").

When troubleshooting resumed on August 21st, the Maintenance Supervisor and a Maintenance Planner reviewed the drawings, which showed that the two non-working light fixtures were on Circuit 36. The drawings had been updated in about 1987 and were verified during troubleshooting.

On August 22, 2007, the Maintenance Supervisor and two Electricians walked down the Building 712 circuits and verified the two light fixtures were on Breaker 36 which was found open. A Caution Tag was hung in the panel directing that circuits marked "Leave off" were not to be turned on without specific permission.

The Electrician, protected by PPE, had not been exposed to hazardous energy because the safe-to-work check verified no energy and because breaker 36 was found open (when breaker 36 is closed, the two outside light fixtures are activated by closing a door). The Caution Tag was hung in the panel (Panel L1) with a handwritten note that before turning any circuit on, one of two individuals should be contacted. (The Caution Tag had likely been in place since the 1990s; one of the two named individuals had retired and the other had transferred to a different organization.) Several breakers in addition to Circuit 36 were open and troubleshooting was suspended pending investigation by Engineering.

The Critique Team on August 22nd determined this event represents an externally reportable violation of HNF-PRO-081 "Lockout/Tagout" for the failure to correctly identify the two non-working lights were on a separate breaker.

<p>Cause Description:</p>	<p>[Apparent] A3B3C05 - Incorrect assumption that a correlation exists between two or more facts - Wrong assumptions were made based on the belief that two or more facts are related to each other and incorrect actions were taken based on the assumption.</p> <p>Many lamps in the six-light fluorescent string were burned out and the Electrician re-lamped the entire string. When the circuit was restored and the two end lights were still dark, the Electrician assumed these ballasts had also failed. The Electrician and the Controlling Organization/ Maintenance Supervisor believed that the entire string was on Circuit 26 as indicated on the lighting Panel Schedule, the Electrician's description of the circuit configuration, and previous relamping experience in other facilities. However, the end lights were on Circuit 36, which was open and the panel was Caution Tagged.</p> <p>This causal factor is addressed by the corrective action to brief Authorized Workers to verify the presence of energy and the absence of energy during pre- and post-checks for voltage (Action 1), and to brief Controlling Organization personnel about identifying hazardous energy isolation points (Action 2).</p> <p>[Couplet for the A3B3C05 Human Error and Root] A4B1C01 - Management policy guidance / expectations not well-defined, understood or enforced - Personnel exhibited a lack of understanding of existing policy and/ or expectations, or policy/ expectations were not well-defined or policy/ expectation is not enforced.</p> <p>The process for completing an Eight-Criteria Checklist includes a provision to "identify the lockout/ tagout boundary using any means necessary (e.g., drawings, databases, documents, and/ or a field walk down)." Management has not effectively disseminated the expectation that field teams identify the isolation boundary in accordance with HNF-PRO-081 "Lockout/Tagout".</p> <p>This causal factor is addressed by the actions to brief Controlling Organization personnel about identifying the isolation boundary (Action 2) and to develop a Lessons Learned document for site distribution (Action 3).</p> <p>The factor tree technique was used to analyze the causal factors surrounding this event. Contact report originator for document.</p>
<p>Operating Conditions:</p>	<p>Normal Operations</p>
<p>Activity Category:</p>	<p>Maintenance</p>
<p>Immediate Action(s):</p>	<ol style="list-style-type: none"> 1. The work activity was suspended and placed in a safe configuration. 2. Proper notifications made.

	<p>3. Controlling Organization delegate performed further investigation of the drawings and field conditions, identifying the second circuit.</p> <p>A critique meeting was held on 08/22/2007 at 1400 hours to determine the apparent causes for the event and provide for a path forward. The results of the Critique Report are incorporated into this Occurrence Report.</p>
FM Evaluation:	<p>Previous occurrences of lockout/ tagout events are EM-RL--PHMC-FSS-2007-0001 "Hazardous Energy was found on the line side plug during the safe to work check of the lighting system at 2101M" and EM-RL--PHMC-GENERAL-2006-0002 "Repetitive Issue: Hazardous Energy Control/ Lockout-Tagout Process". These reports describe events where Authorized Workers were not successful at ready identification of a single energy source (the Eight-Criteria Checklist specifies that a single energy source be readily identifiable).</p> <p>EM-RL--PHMC-FSS-2007-0001 was similar in involving a light string with two power sources. The sketch in the Facility Modification Package used to develop the Eight Criteria Checklist showed only one power source. The electrical drawing showed the circuits accurately but was not used.</p> <p>EM-RL--PHMC-GENERAL-2006-0002 is a Repetitive Issue report describing the common cause analysis of previous hazardous energy control occurrences across the Hanford Site, including other examples of lockout/ tagout technical review errors.</p> <p>Specific to this 712 building event, the Controlling Organization/ Maintenance Supervisor and the Electrician did not recognize the Lockout/Tagout process requirement for a thorough investigation and technical review before using the Eight Criteria Checklist. In this case a drawing review would have surfaced the additional single energy source at Breaker 36 for the two end light fixtures and may prevent recurrence of this type event.</p> <p>A couple actions are included to address Extraneous Conditions Adverse to Safety involving the lighting panel (PNL L1) surfaced during investigation of this event. Action 4 is to clear or properly install the Caution Tag and Action 5 is to address clarification of the panel schedule.</p>
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	No
Division or Project:	Fluor Hanford/Closure Services & Infrastructure

Plant Area:	RCHN		
System/Building/Equipment:	Electrical System/ 712 Building/ lighting panel		
Facility Function:	Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)		
Corrective Action 01:	<table border="1"> <tr> <td>Target Completion Date:11/05/2007</td> <td>Tracking ID:CARF 20070736</td> </tr> </table> <p>[NTS] Brief Authorized Workers to the importance of verifying the presence and absence of energy during pre- and post-checks for voltage. Closure is a brief description, a list of the people who needed the briefing and a list of the people who received the briefing and documentation such as an attendance roster to show who received the briefing. NSRC approval required to close this assignment.</p> <p>TL Ostrander, Manager Facility Support JW Legge, Mechanical/ Electrical</p>	Target Completion Date: 11/05/2007	Tracking ID: CARF 20070736
Target Completion Date: 11/05/2007	Tracking ID: CARF 20070736		
Corrective Action 02:	<table border="1"> <tr> <td>Target Completion Date:08/27/2007</td> <td>Tracking ID:CARF 20070736</td> </tr> </table> <p>[NTS] CS&I Controlling Organization personnel were briefed to the HNF-PRO-081 "Lock/ Tagout" requirements for performing a thorough technical review for establishing the energy isolation boundary and approving an Eight Criteria Checklist. The briefing emphasized Sections 5.2, 5.9, and the Appendix A definition "readily identifiable". Closure is a brief description, a list of the people who needed the briefing and a list of the people who received the briefing. NSRC approval required to close this assignment.</p> <p>JW Strege, Manager Facility & Support Services Planning This action is complete.</p>	Target Completion Date: 08/27/2007	Tracking ID: CARF 20070736
Target Completion Date: 08/27/2007	Tracking ID: CARF 20070736		
Corrective Action 03:	<table border="1"> <tr> <td>Target Completion Date:11/09/2007</td> <td>Tracking ID:CARF 20070736</td> </tr> </table> <p>[NTS] Submit a draft of the lessons to be learned from this event to the PHMC Lessons Learned Coordinator for consideration as a formal lessons learned. Closure is a copy of the lessons learned submittal and the e-mail transmitting the lessons learned to the PHMC Lessons Learned Coordinator. NSRC approval required to close this assignment.</p> <p>JW Strege, Manager Facility & Support Services Planning</p>	Target Completion Date: 11/09/2007	Tracking ID: CARF 20070736
Target Completion Date: 11/09/2007	Tracking ID: CARF 20070736		
Corrective Action 04:	<table border="1"> <tr> <td>Target Completion Date:11/09/2007</td> <td>Tracking ID:CARF 20070736</td> </tr> </table> <p>Clear or properly install the Caution Tag in Building 712 PNL L1. Closure is a description of what was done to resolve the action and completion date.</p> <p>CW Stolle, Manager Facility & Land Management</p>	Target Completion Date: 11/09/2007	Tracking ID: CARF 20070736
Target Completion Date: 11/09/2007	Tracking ID: CARF 20070736		
Corrective Action 05:	<table border="1"> <tr> <td>Target Completion Date:11/09/2007</td> <td>Tracking ID:CARF 20070736</td> </tr> </table> <p>Clarify the Panel Schedule for PNL L1. Closure is a description of what was done to resolve the action and completion date.</p>	Target Completion Date: 11/09/2007	Tracking ID: CARF 20070736
Target Completion Date: 11/09/2007	Tracking ID: CARF 20070736		

	CW Stolle, Manager Facility & Land Management
Corrective Action 06:	Target Completion Date: 11/15/2007 Tracking ID: CARF 20070736
	<p>[NTS] Perform an Extent of Condition evaluation a) to determine whether FH Projects are utilizing the proper methods to identify the correct isolation boundaries for Eight-Criteria work, and b) to identify what administrative controls Projects have in place for Caution Tags on equipment. Closure is a copy of the evaluation. Enter any additional actions from the EOC evaluation to this occurrence report under this CARF. NSRC approval required to close this assignment.</p> <p>DJ Wiatrak, Manager FH Occupational Safety & Health JP Kinz/ KW Gray, FH Occupational Safety & Health</p>
Corrective Action 07:	Target Completion Date: 05/08/2008 Tracking ID: CARF 20070736
	<p>Perform an Effectiveness Review.</p> <p>DJ Wiatrak/ BJ Gray, Manager FH Occupational Safety & Health</p>
Lessons(s) Learned:	<p>Both the Electrician and Controlling Organization/ Maintenance Supervisor were responsive to the customer's last minute request to re-lamp a six-fixture fluorescent light string at the same time the facility emergency lighting was repaired. The work package for this work allowed changing ballasts with Controlling Organization concurrence (HNF-PRO-081 "Lockout/ Tagout"). The lighting Panel Schedule indicated that all the lights in this string were on Breaker 26.</p> <p>After the lamps were replaced and the circuit was restored, the lights on the two end fixtures still did not work. The Electrician became convinced by the available evidence (including the Panel Schedule) that the fluorescent ballasts in these fixtures had failed. The Electrician and Controlling Organization/ Maintenance Supervisor then completed an Eight-Criteria Checklist to isolate circuit 26 and replace the ballasts. The new ballasts did not correct the problem because the end lights were on Circuit 36 and Breaker 36 was open.</p> <p>Both people were relatively new to the Hanford Site but were already aware that facility electrical drawings do not always reflect the as-built circuit configuration. Neither recognized the HNF-PRO-081 "Lockout/Tagout" process requirement to verify the correct Lockout/ Tagout circuit using any means necessary. Because the investigation and technical review were not rigorous, the drawings were not reviewed (and the Electrician did not check for positive energy at the end lights), the second circuit on Breaker 36 was not identified and the appropriate hazard controls were not implemented. The Electrician was not exposed to hazardous energy after the Safe-To-Work check because Breaker 36 was open and the panel Caution Tagged</p>

(and the Electrician was wearing PPE that likely would have prevented contact with live parts).

The lessons to be learned from this event are that even a relatively minor Eight-Criteria Checklist should include a review of electrical drawings and additional planning to ensure the hazards are correctly identified and properly controlled. Also, Management must be alert for organizational weaknesses such as failing to reinforce the need to ensure the energy isolation point has been correctly identified.

HQ Keywords:

01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous)
01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical)
01M--Inadequate Conduct of Operations - Inadequate Job Planning (Electrical)
01O--Inadequate Conduct of Operations - Inadequate Maintenance
01R--Inadequate Conduct of Operations - Management issues
12I--EH Categories - Lockout/Tagout (Electrical or Mechanical)
14C--Quality Assurance - Quality Improvement Deficiency
14E--Quality Assurance - Work Process Deficiency

HQ Summary:

After maintenance personnel had replaced two light fixture ballasts in Building 712A, it was determined that the two lights were on a different circuit from the circuit that was opened and isolated for the work activity. Fortunately, this second circuit powering the two lights was also in an open configuration (although not isolated, as required) and the worker was not exposed to hazardous electrical energy. The work activity was suspended and placed in a safe configuration, appropriate notifications were made, and a fact-finding critique was held.

Similar OR Report Number:

- 1. EM-RL--PHMC-FSS-2007-0001
- 2. EM-RL--PHMC-GENERAL-2006-0002

Facility Manager:

Name	C.W. Stolle
Phone	(509) 376-9080
Title	Manager, Facilities & Land Management

Originator:

Name	CRARY, NEWELL L
Phone	(509) 376-3030
Title	OCCURRENCE NOTIF. CTR. DUTY OFFICER

HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:

Date	Time	Person Notified	Organization
08/22/2007	15:45 (PTZ)	L.E. Earley	DOE-RL

	08/22/2007	15:45 (PTZ)	R.G. Slocum	FH
Authorized Classifier(AC):				

2)Report Number:	EM-RL--PHMC-TPLANT-2007-0004 After 2003 Redesign		
Secretarial Office:	Environmental Management		
Lab/Site/Org:	Hanford Site		
Facility Name:	T-Plant Facility		
Subject/Title:	Construction Worker Experiences Minor Electrical Shock During Piping Inspection		
Date/Time Discovered:	08/23/2007 11:15 (PTZ)		
Date/Time Categorized:	08/23/2007 12:09 (PTZ)		
Report Type:	Final		
Report Dates:	Notification	08/27/2007	20:22 (ETZ)
	Initial Update	10/04/2007	15:26 (ETZ)
	Latest Update	10/04/2007	15:26 (ETZ)
	Final	10/04/2007	15:26 (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:	A2B2C04 - Equipment/ material problem; Periodic/Corrective Maintenance LTA; Equipment history LTA A3B3C01 - Human Performance Less Than Adequate (LTA); Knowledge Based Error; Attention was given to wrong issues -->couplet - A4B5C04 - Management Problem; Change Management LTA; Risks / consequences associated with change not adequately reviewed / assessed		
ISM:	3) Develop and Implement Hazard Controls		
Subcontractor Involved:	No		
Occurrence Description:	A Construction Services pipefitter was performing repairs to Fire Suppression System sprinkler piping. No electrical work was involved and no isolation of electrical energy was required to perform the work. The pipefitter brushed an elbow against an unused incandescent lighting fixture (luminaire) located approximately 16 inches from the pipe. The worker felt a slight tingling sensation. The worker immediately stopped work and reported to management. Investigation found that the luminaire, which had the base of a broken lamp inserted into the fixture, was energized at 120		

volts.

Background:

Construction Services personnel were working on an ongoing project to install sprinkler piping in the T Plant Facility. The scope of work for the day was to repair previously identified leaks, then partially charge the installed system to 100 pounds per square inch (psi), check for leaks, and repair any identified leaks. Two leaks had been found the previous day in the T Plant lunchroom and were repaired prior to charging the system. The piping was charged to 100 psi, and two additional leaks were identified. These were also located in the T Plant lunchroom.

At approximately 1105 hours, the pipefitter went up on a ladder to attempt to repair one of the identified leaks. The crew was trying to complete the job in order to allow personnel into the lunchroom at 1130 hours for lunch. The pipefitter was working to remove a pipe from a 90 degree angle. He was handing down the pipe when his right elbow contacted an unused stem-hung incandescent luminaire. He felt a slight tingling sensation on his elbow. He stopped work and made notifications to management about the event.

The pipefitter was taken to First Aid, checked out, and returned to work without restriction. A Construction Services electrician used a proximity meter to check the luminaire. Closer examination of the fixture found that the base of a broken-off incandescent lamp was still present in the fixture and that the fixture was energized at 120 volts.

T Plant management suspended Construction activities pending further investigation. Appropriate energy isolation was installed and the incandescent luminaire was physically removed. The T Plant electrical subject matter expert (SME) is tracing circuits to verify that no other potential hazards are present.

The incandescent luminaires in the T Plant lunchroom have been out of service for approximately twenty years. Current lighting is provided by fluorescent drop-in panels integrated into a suspended ceiling.

Using the Energy Facility Contractor's Group (EFCOG) Electrical Severity Index Tool, the event scored 330, "moderately high severity."

Cause Description:

A causal analysis was performed using Barrier Analysis technique.

Apparent Cause:

A2B2C04, Equipment History LTA

Use of the luminaire had ended approximately 20 years ago. At the time, the

power to the luminaire was not terminated. The reason for not terminating the power is unknown. During a walkdown to review for similar hazards, several other energized lighting fixtures were found in the facility. Some were located in the overhead, but not all were hidden by false ceilings. Each of the fixtures identified was located in out of the way, non-routinely accessed areas. Some of these legacy fixtures were connected to systems that still needed power, which would provide a basis for why the fixtures were not de-energized.

To address this causal factor, T Plant disconnected power and physically remove the luminaire (Action 1). T Plant performed a walk down of the facility to identify other similar hazards (Action 2). The facility mitigated the hazard for any additional identified equipment (physically disconnect or place in safe condition) (Action 3).

Root Cause

A3B3C01, Knowledge Based Error, Attention Given to Wrong Issues Coupled with A4B5C04, Risk/Consequences Related to Change Not Adequately Identified.

The fixtures identified were legacy equipment, some of which were installed during the construction of T Plant in the 1940's. Many of these fixtures were similar to the luminaire, in that physical appearance of the equipment masked its actual use (the luminaire involved in this event appeared to be a lighting hanger). Because personnel were unaware of the use of the equipment, this influenced the recognition of the potential hazard.

The pre-work walkdown of the area was also an unsuccessful barrier. Pre-construction initial walkdowns conducted over a year ago. Ceiling panels were still up when these walkdowns were performed. After the ceiling panels were removed, there was not a follow-up inspection to review for new or changed hazards. However, during construction activities, a condition was observed where non-terminated wires were identified when a ceiling panel was observed. Following this discovery, additional inspections were performed for similar hazards. These inspections did not detect the luminaire, either because of its appearance or because the work in the lunchroom had been completed at that time. It should be noted that viewing the fixture from the floor level likely would not have revealed the broken-off incandescent light bulb. Only close inspection would identify the true nature of the hazard.

To address these causal factors, Construction revised the JSA to require an independent inspection for hazards by a Field Work Supervisor and an electrician (Action 4). T Plant will enter lessons learned from this event into

	<p>the Job Control System database for retrieval during future planning activities (Action 5). A lessons learned will be documented and provided to FH Lessons Learned Coordinator for dissemination (Action 6). FH will perform an extent of condition review (Action 7).</p>
Operating Conditions:	Construction
Activity Category:	Construction
Immediate Action(s):	<p>The worker was taken to First Aid and was returned to work with no restrictions.</p> <p>Management placed a temporary hold on Construction work pending further investigation.</p> <p>The area was cordoned off to prevent personnel access.</p> <p>Appropriate energy isolation was installed in accordance with HNF-PRO-081 and the luminaire was physically removed.</p> <p>A critique was conducted.</p>
FM Evaluation:	<p>This event presented the potential for a worker injury. The identification of the problem and the response by personnel was timely and performed well. The T Plant facility was constructed in the 1940's. Over the life of the facility, many issues have been discovered due to lack of configuration information on systems. To address this lack of information, T Plant adopted two practices which have been useful. One practice is to perform a full walkdown validation of electrical work to ensure that the configuration is known. The second is to terminate legacy components to prevent discovery of energized systems during the eventual decommissioning of the facility.</p> <p>While increased walkdowns and better information on legacy equipment can help to mitigate events, these actions cannot prevent discovery of an unknown condition. These steps can assist in identifying issues at a point in the process where the condition has minimal impact to worker safety.</p> <p>A review of the Occurrence Reporting and Processing System identified three similar events, in which pipefitter were working adjacent to lighting fixtures and receiving a minor shock due to contact with the fixture. One of these event occurred at the T Plant facility. Based on the descriptions provided, these legacy fixtures were readily identifiable as lighting fixtures, and were still in service. No additional actions or lessons learned were obtained from review of these events.</p>
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	No
Division or Project:	Waste Stabilization and Disposition
Plant Area:	200 West

System/Building/Equipment:	271T T Plant
Facility Function:	Nuclear Waste Operations/Disposal
Corrective Action 01:	Target Completion Date: 08/24/2007 Tracking ID: CARF 20070739
	Disconnect power and physically remove the luminaire. Responsible Manager: Metzger
Corrective Action 02:	Target Completion Date: 08/30/2007 Tracking ID: CARF 20070739
	Perform walk down of T Plant to identify other similar hazards. Responsible Manager: Metzger
Corrective Action 03:	Target Completion Date: 08/30/2007 Tracking ID: CARF 20070739
	Mitigate the hazard for any additional identified equipment (physically disconnect or place in safe condition). Responsible Manager: Metzger
Corrective Action 04:	Target Completion Date: 08/30/2007 Tracking ID: CARF 20070739
	Revised JSA to require an independent inspection for hazards by FWS and electrician. Responsible Manager: Adkins
Corrective Action 05:	Target Completion Date: 12/01/2007 Tracking ID: CARF 20070739
	Enter lessons learned from this event into the Job Control System database for retrieval during future planning activities. Responsible Manager: Metzger
Corrective Action 06:	Target Completion Date: 12/01/2007 Tracking ID: CARF 20070739
	Document a lessons learned and provide to FH lessons learned coordinator for dissemination. Responsible Manager: Burrow
Corrective Action 07:	Target Completion Date: 12/01/2007 Tracking ID: CARF 20070739
	Perform an Extent of Condition review. Responsible Manager: Adkins
Corrective Action 08:	Target Completion Date: 06/08/2008 Tracking ID: CARF 20070739
	Perform an Effectiveness Review for the corrective actions. Responsible Manager: Adkins

Lessons(s) Learned:	Older facilities may contain hazards that are difficult to discern. In this event, an unused incandescent lighting fixture (luminaire) had the appearance of a piece of piping used as a hanger. Only close inspection would identify the true nature of the hazard. When conducting inspections of older facilities, it is important to look not only for expected hazards, but for unexpected ones. This involves confirming that you know the purpose of each piece of equipment in the vicinity of the work area.															
HQ Keywords:	01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous) 01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control 01N--Inadequate Conduct of Operations - Inadequate Job Planning (Other) 01R--Inadequate Conduct of Operations - Management issues 05D--Mechanical/Structural - Mechanical Equipment Failure/Damage 08A--OSHA Reportable/Industrial Hygiene - Electrical Shock 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:	A pipefitter at the T-Plant was performing repairs to Fire Suppression System sprinkler piping, and experience a minor shock when his elbow contacted a nearby unused incandescent lighting fixture. The worker immediately stopped work and reported to management. He reported to first aid and was examined and released without restrictions. Investigation found that the lighting fixture, which had the base of a broken lamp inserted into it, was energized at 120 volts. The fixture was removed.															
Similar OR Report Number:	1. EM-ORO--BNFL-K33-2004-0004 2. EM-RL--WHC-TPLANT-1996-0015 3. EM-ORO--ORNL-X10ATY12-2000-0002 4.															
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td colspan="3">Gregory, Robert E</td> </tr> <tr> <td>Phone</td> <td colspan="3">(509) 373-9980</td> </tr> <tr> <td>Title</td> <td colspan="3">Facility Manager</td> </tr> </table>				Name	Gregory, Robert E			Phone	(509) 373-9980			Title	Facility Manager		
Name	Gregory, Robert E															
Phone	(509) 373-9980															
Title	Facility Manager															
Originator:	<table border="1"> <tr> <td>Name</td> <td colspan="3">POOLE, M ELIZABETH</td> </tr> <tr> <td>Phone</td> <td colspan="3">(509) 373-0522</td> </tr> <tr> <td>Title</td> <td colspan="3"></td> </tr> </table>				Name	POOLE, M ELIZABETH			Phone	(509) 373-0522			Title			
Name	POOLE, M ELIZABETH															
Phone	(509) 373-0522															
Title																
HQ OC Notification:	<table border="1"> <thead> <tr> <th>Date</th> <th>Time</th> <th>Person Notified</th> <th>Organization</th> </tr> </thead> <tbody> <tr> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> </tr> </tbody> </table>				Date	Time	Person Notified	Organization	NA	NA	NA	NA				
Date	Time	Person Notified	Organization													
NA	NA	NA	NA													
Other Notifications:	<table border="1"> <thead> <tr> <th>Date</th> <th>Time</th> <th>Person Notified</th> <th>Organization</th> </tr> </thead> <tbody> <tr> <td>08/23/2007</td> <td>11:20 (PTZ)</td> <td>S Metzger</td> <td>T Plant</td> </tr> </tbody> </table>				Date	Time	Person Notified	Organization	08/23/2007	11:20 (PTZ)	S Metzger	T Plant				
Date	Time	Person Notified	Organization													
08/23/2007	11:20 (PTZ)	S Metzger	T Plant													

	08/23/2007	12:23 (PTZ)	N Crary	FH ONC
	08/23/2007	12:25 (PTZ)	DH Splett	DOE RL

Authorized Classifier(AC):

3)Report Number:	EM-RL--PHMC-WESF-2007-0001 After 2003 Redesign		
Secretarial Office:	Environmental Management		
Lab/Site/Org:	Hanford Site		
Facility Name:	Waste Encapsulation & Storage Fac.		
Subject/Title:	Energized Lead Found During Facility Modification		
Date/Time Discovered:	08/02/2007 13:55 (PTZ)		
Date/Time Categorized:	08/02/2007 16:20 (PTZ)		
Report Type:	Final		
Report Dates:	Notification	08/06/2007	19:48 (ETZ)
	Initial Update	09/14/2007	12:54 (ETZ)
	Latest Update	09/14/2007	12:54 (ETZ)
	Final	09/14/2007	12:54 (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:	A1B5C02 - Design/Engineering Problem; Operability of Design / Environment LTA; Physical environment LTA A5B3C01 - Communications Less Than Adequate (LTA); Written Communications Not Used; Lack of written communication		
ISM:	2) Analyze the Hazards		
Subcontractor Involved:	No		
Occurrence Description:	<p>Work was being performed to remove two electrical panels to correct NEC noncompliances. The panel the electrician was working on had been physically disconnected. The electrician was pulling a white wire when he noted a small electrical spark. He checked the wire with a voltmeter and found the wire to be energized with 115 volts.</p> <p>Background</p> <p>A Work Package had been developed to address National Electrical Code (NEC) noncompliances in the 225BD building. These NEC upgrades, which</p>		

had been identified by workers as a safety concern. Part of the Work Package involved removing two old electrical panels and replacing the panels with a single upgraded model. Because the 225BD houses the facility stack monitoring equipment, power had to be maintained for essential equipment.

In order to isolate the panels for removal, an Authorized Worker Lock was hung on a manual isolation switch, which disconnects power to the transformer feeding the distribution panels being removed. The isolation point had been identified by the controlling organization and the design authority. This isolation point was identified by a review of the available drawings and a walkdown of the work site. A Safe to Work Check was performed by visually confirming that power was shut down, and by checking at the transformer primary disconnect with an adequately rated voltmeter. No power was found. The two electrical panels were removed from the circuit, and the AWL was removed. The workers provide temporary power to essential equipment through a mini power center, which was fed from a different source.

The electrician began to pull wires back to a convenient location so that they could work on the conduit. The electrician was pulling a white wire when he noted a small spark. He checked the wire with a voltmeter and found the conductor was energized with 115 volts. The wire had been connected to a neutral buss. The worker was not injured and there was no damage to equipment.

The electrician placed the energized lead into a safe condition. He installed a barrier tape around the area. Based on visual inspection by the electrician, the conduit containing the energized wire led to a junction box on the outside of the 225B truck lock (a separate building from where the work was being conducted).

Cause Description:

An Apparent Cause Analysis was performed.

A1B5C02, Design Operability, Physical Environment
A5B3C01, Written Communication, Lack of Written Communication

The neutral wire seems to have been installed after the other system wires. All the system wires were stranded wire except the neutral. The neutral in question was solid wire. The drawing wire run list does not show the neutral wire. Because the panel was installed in 1999, the reason for this installation can only be surmised. However, it is believed the neutral was installed during the Acceptance Test Procedure to address a problem with the system, and therefore was not incorporated into the drawing.

When the neutral was installed, it was improperly routed. Because of this routing, when the Mini-Power Center was energized to power essential

	<p>equipment, the neutral completed its path from the circuit breaker panelboard to the Mini Power Center through building steel. When the improperly routed neutral was lifted from ground, it rose to 120 volts. This is not a shared neutral condition. Any time the neutral is separated (broken) on an energized circuit, it will go "hot".</p> <p>To address these causal factors, A design change was released to properly connect the neutral at the relay enclosure and update the drawings (Action 1). The change was incorporated into the work package and the neutral was properly re-routed (Action 2)</p>
Operating Conditions:	Maintenance - Performing Facility Modification
Activity Category:	Maintenance
Immediate Action(s):	<p>Stopped work.</p> <p>Placed energized wire into a safe configuration.</p> <p>Blocked the area off with barrier tape.</p> <p>Made notifications to supervision.</p> <p>The work package was suspended pending further investigation.</p> <p>A critique was performed.</p>
FM Evaluation:	<p>The electrician did a good job of recognizing and isolating a potential hazard. Because he treated the equipment as though energy might be present, his caution helped to identify the condition and prevent injury to himself or others.</p> <p>To address this event, every panel, conduit, and box associated with the circuit breaker panelboards and relay enclosure were opened for inspection. Each wire was physically traced for proper routing. The only misrouting was the neutral wire.</p> <p>The event was not due to a shared neutral, but was caused by an improperly routed neutral. Both panelboards that were being removed had been physically disconnected. Because the neutral was misrouted, it completed its path through the circuit panel board to the energized Mini Power Center through building steel. Electricians would not be able to identify that the neutral had power until it was disconnected from ground.</p> <p>A search was performed of the Occurrence Reporting and Processing System. An event in which a misrouted neutral wire resulted in a shock was identified in EM-RL--PHMC-PFP-2005-0011. No additional actions or lessons learned were identified.</p>
DOE Facility Representative Input:	
DOE Program Manager Input:	

Further Evaluation is Required:	No
Division or Project:	Waste Stabilization and Disposition
Plant Area:	200 East
System/Building/Equipment:	225 BD
Facility Function:	Nuclear Waste Operations/Disposal
Corrective Action 01:	Target Completion Date: 08/16/2007 Tracking ID: CARF 20070688
	Every panel, conduit, and box associated with the circuit breaker panelboards and relay enclosure were opened for inspection. Each wire was physically traced for proper routing. Responsible Manager: Pennock
Corrective Action 02:	Target Completion Date: 08/16/2007 Tracking ID: CARF 20070688
	A design change was released to properly connect the neutral at the relay enclosure and update the drawings. Responsible Manager: Pennock
Corrective Action 03:	Target Completion Date: 08/16/2007 Tracking ID: CARF 20070688
	The change was incorporated into the work package and the neutral was properly re-routed. Responsible Manager: Pennock
Lessons(s) Learned:	If a neutral wire is inappropriately routed, it can complete a connection to a power source through building steel. In this situation, the energy is not apparent until the neutral is disconnected from ground. Electricians should always treat components as though energy was present to reduce the potential for injury.
HQ Keywords:	01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control 01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical) 01M--Inadequate Conduct of Operations - Inadequate Job Planning (Electrical) 12C--EH Categories - Electrical Safety 14D--Quality Assurance - Documents and Records Deficiency 14E--Quality Assurance - Work Process Deficiency
HQ Summary:	While removing two electrical panels as part of an electrical upgrade for the 225BD building, an electrician pulled a wire and noted a small electrical spark. He checked the wire and found 115 volts present. The electrician placed the energized lead into a safe condition. He installed a barrier tape around the area. The work package was suspended pending further investigation.

Similar OR Report Number:	1. EM-RL--PHMC-PFP-2005-0011			
Facility Manager:	Name	Flyckt, Donald L		
	Phone	(509) 372-3142		
	Title	Facility Manager		
Originator:	Name	POOLE, M ELIZABETH		
	Phone	(509) 373-0522		
	Title			
HQ OC Notification:	Date	Time	Person Notified	Organization
	NA	NA	NA	NA
Other Notifications:	Date	Time	Person Notified	Organization
	08/02/2007	13:55 (PTZ)	DL Flyckt	LPCS
	08/02/2007	16:20 (PTZ)	CH Gunion	DOE RL
	08/02/2007	16:55 (PTZ)	M Boyce	FH ONC
Authorized Classifier(AC):				

4)Report Number:	EM-RP--BNRP-RPPWTP-2007-0015 After 2003 Redesign		
Secretarial Office:	Environmental Management		
Lab/Site/Org:	Hanford Site		
Facility Name:	RPP Waste Treatment Plant		
Subject/Title:	Power Cord Pulled from Male Cord Cap		
Date/Time Discovered:	08/13/2007 13:00 (PTZ)		
Date/Time Categorized:	08/13/2007 15:00 (PTZ)		
Report Type:	Final		
Report Dates:	Notification	08/15/2007	15:06 (ETZ)
	Initial Update	10/02/2007	12:25 (ETZ)
	Latest Update	10/02/2007	12:25 (ETZ)
	Final	10/02/2007	12:25 (ETZ)
Significance Category:	3		
Reporting Criteria:	10(3) - A near miss, where no barrier or only one barrier prevented an event from having a reportable consequence. One of the four significance categories should be assigned to the near miss, based on an evaluation of the potential risks and the corrective actions taken. (1 of 4 criteria - This is a SC 3 occurrence)		
Cause Codes:	A3B1C01 - Human Performance Less Than Adequate (LTA); Skill Based Errors; Check of work was LTA		

	-->couplet - A4B3C09 - Management Problem; Work Organization & Planning LTA; Work planning not coordinated with all departments involved in task
ISM:	2) Analyze the Hazards
Subcontractor Involved:	Yes FD Thomas
Occurrence Description:	On August 13, a carpenter crew was positioning a mobile rolling scaffold on the crane rail of the melter gallery crane bay area in the LAW Building +28 for the Subcontractor, FD Thomas. While positioning the scaffold, the top handrail of the scaffolding snagged a power cord pulling the cord with enough tension to cause the conductors within the cord to separate from the termination points within the male cape. The cord was looped and tied down the wall with zip ties and supplied power to a temporary light fixture mounted on the north wall. The conductors coming from the temporary light fixture were pulled out of the male end cord cap. The resulting exposed conductors were not energized. The energized conductors within the female cord cap were never exposed and the light fixture was not damaged.
Cause Description:	<p>The causal analysis method used was the Causal Analysis Tree model as documented in DOE G 231.1-2. The apparent causal analysis (ACA) developed for this occurrence was derived using the following documentation:</p> <ul style="list-style-type: none"> * Bechtel Accident Investigation Report 24590-WTP-BAI-SA-07-033, * Employee statements. <p>Apparent Cause Analysis -</p> <p>The carpenters were requested by a subcontractor to move two rolling scaffolds on the day of the event, from east to west. The carpenters had moved the scaffolding numerous days over the course of the week with no incident. Environmental conditions were not adverse to performing the function (lighting was acceptable). The carpenters did a visual inspection of the area, and had the subcontractor remove sprayer lines hanging over the rail on one of the scaffolds. The carpenters moved the scaffold. The carpenters then moved the second scaffold from east to west, but snagged an electrical cord hanging down.</p> <p>It was noted previously by a subcontractor that the cord had hung down upon the scaffolding in the past. The subcontractor had to move the cord aside from the scaffold several times. The overhead light powered by the electrical cord that was pulled apart was off most of the time.</p> <p>The carpenters' vision was partially impaired while moving the scaffolding. Therefore, the carpenters would not notice catching an electrical cord while moving the scaffolding. The carpenters did not perform a 360 degree walk</p>

around the rolling scaffold to ensure there were no cords, hoses, etc. that could be snagged (cause code A3B1C01, Check of work was less than adequate).

It was determined that the cords in the area (including the damaged cord) had not been checked in the area. The reason for this was that the area was inaccessible due to work crews not being permitted to enter the area the subcontractor was working (cause code A4B3C09, Work planning not coordinated with all departments involved in task).

Corrective Actions -

The following corrective actions were developed to address the causes identified during the apparent cause analysis:

CA1. Discuss with carpenters the importance of performing a 360 degree walk around of rolling scaffolding to ensure there are no cords, hoses, etc. that can be snagged.

CA2. Electricians are to enter the area to inspect and retie cords, as needed.

Evaluation for Recurrence -

Previous occurrence reports submitted for WTP were reviewed against the details of the event documented in this report. The review concluded that this event is not associated with the recurrence of previous events. Specifically, the detail of the cause (e.g., catching a cord while moving a scaffold due to failure to conduct a proper 360 degree of the scaffold, and the failure to coordinate work with Electricians to ensure that cords are properly tied and kept out of the path of work) did not match previous events documented.

Operating Conditions:	Construction
Activity Category:	Construction
Immediate Action(s):	The Area was placed in a safe configuration and secured for investigation. An investigation was initiated.
FM Evaluation:	The conclusions of the occurrence were in keeping with the expectations of management concerning workers implementing controls currently in place to ensure safety and health. Specifically, workers are required to perform a safety review of their work environment prior to each activity, to ensure that conditions are consistent with what was identified earlier. Complacency can result in a lessening of perceived hazards. The corrective actions of this occurrence are not expected to significantly impact cost or schedules. Point-in-fact, the corrective actions will improve cost and schedule by reducing frequency of reportable events.

DOE Facility Representative Input:							
DOE Program Manager Input:							
Further Evaluation is Required:	No						
Division or Project:	Waste Treatment Plant						
Plant Area:	600						
System/Building/Equipment:	Law Activity Waste (LAW) Building						
Facility Function:	Nuclear Waste Operations/Disposal						
Corrective Action 01:	Target Completion Date: 08/16/2007 Tracking ID: N/A						
	Discussed with the carpenters the importance of performing a 360 degree walk around of rolling scaffold to ensure there are no cords, hoses, etc. that can be snagged.						
Corrective Action 02:	Target Completion Date: 08/13/2007 Tracking ID: N/A						
	Had electricians move into the area to inspect and retie other cords, as needed.						
Lessons(s) Learned:	N/A						
HQ Keywords:	01N--Inadequate Conduct of Operations - Inadequate Job Planning (Other) 07D--Electrical Systems - Electrical Wiring 08F--OSHA Reportable/Industrial Hygiene - Industrial Operations Issues 08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance 08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical) 12C--EH Categories - Electrical Safety 14E--Quality Assurance - Work Process Deficiency						
HQ Summary:	While positioning a scaffold on the crane rail of the melter gallery crane bay area in the LAW Building, the top handrail of the scaffolding snagged a power cord male end cap that supplied power to a temporary light fixture. The conductors coming from the temporary light fixture were exposed, but they were not energized. The area was placed in a safe configuration and an investigation was initiated.						
Similar OR Report Number:	1. None.						
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td>READDY, MICHAEL A</td> </tr> <tr> <td>Phone</td> <td>(509) 373-8300</td> </tr> <tr> <td>Title</td> <td>OCCURRENCE REPORT COORDINATOR</td> </tr> </table>	Name	READDY, MICHAEL A	Phone	(509) 373-8300	Title	OCCURRENCE REPORT COORDINATOR
Name	READDY, MICHAEL A						
Phone	(509) 373-8300						
Title	OCCURRENCE REPORT COORDINATOR						
Originator:	<table border="1"> <tr> <td>Name</td> <td>BOND, SHAWN L</td> </tr> <tr> <td>Phone</td> <td>(509) 371-2117</td> </tr> <tr> <td>Title</td> <td>SAFETY OPERATIONS SPECIALIST</td> </tr> </table>	Name	BOND, SHAWN L	Phone	(509) 371-2117	Title	SAFETY OPERATIONS SPECIALIST
Name	BOND, SHAWN L						
Phone	(509) 371-2117						
Title	SAFETY OPERATIONS SPECIALIST						
HQ OC Notification:	<table border="1"> <tr> <td>Date</td> <td>Time</td> <td>Person Notified</td> <td>Organization</td> </tr> </table>	Date	Time	Person Notified	Organization		
Date	Time	Person Notified	Organization				

	NA	NA	NA	NA	
Other Notifications:	Date	Time	Person Notified	Organization	
	08/13/2007	13:00 (PTZ)	Jim Navarro	DOE/FR	
	08/13/2007	13:00 (PTZ)	Grant Ceffalo	BNI/SA.	
	08/13/2007	14:45 (PTZ)	Mike Lewis	BNI/Con.	
	08/13/2007	16:50 (PTZ)	Sam Baker	ONC	
Authorized Classifier(AC):					

5)Report Number:	EM-SR--WSRC-SUD-2007-0004 After 2003 Redesign		
Secretarial Office:	Environmental Management		
Lab/Site/Org:	Savannah River Site		
Facility Name:	Site Utilities Department		
Subject/Title:	Fuses Failed to Operate as Designed on 13.8 KV Electrical Distribution System		
Date/Time Discovered:	08/07/2007 13:30 (ETZ)		
Date/Time Categorized:	08/07/2007 15:30 (ETZ)		
Report Type:	Final		
Report Dates:	Notification	08/08/2007	11:26 (ETZ)
	Initial Update	09/20/2007	17:28 (ETZ)
	Latest Update	09/20/2007	17:28 (ETZ)
	Final	09/20/2007	17:28 (ETZ)
	Revision 1	09/24/2007	14:48 (ETZ)
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:	A2B4C02 - Equipment/ material problem; Material control LTA; Material storage LTA A2B6C01 - Equipment/ material problem; Defective, Failed or Contaminated; Defective or failed part A7B1C01 - Other problem; External Phenomena; Weather or ambient conditions LTA A4B3C08 - Management Problem; Work Organization & Planning LTA; Job scoping did not identify special circumstances and/or conditions		

ISM:	<p>2) Analyze the Hazards</p> <p>4) Perform Work Within Controls</p> <p>5) Provide Feedback and Continuous Improvement</p>
Subcontractor Involved:	No
Occurrence Description:	<p>An investigation into two recent, but non-related, miscoordination occurrences involving line distribution fuses led to the discovery that moisture had caused the boric acid material to swell such that the fuse fault clearing mechanism would not operate properly. In this condition, the backup overcurrent device (usually a relay on the 13.8KV line) must operate to clear any fault downstream of the fuse that would otherwise be cleared by the fuses themselves. As a result, any arc flash calculations that depended on the line distribution fuses under investigation are now indeterminate. Investigation into this occurrence is ongoing. Initially this event is being reported under the Management Concern reporting criterion and is subject to being upgraded based on the results of the investigation.</p> <p>The corrective actions developed as a result of this occurrence will be tracked through closure in the Washington Savannah River Company (WSRC) Site Tracking, Analysis and Reporting (STAR) system, record # 2007-CTS-009016.</p>
Cause Description:	<p>The causes of this event were identified by use of the WSRC Manual SCD-9, Problem Analysis, by use of the WSRC Causal Analysis Tree (CAT), and by engineering evaluation.</p> <p>It appears that moisture intrusion into the SM5 fuses resulted from not storing, handling and installing the fuse refill units in accordance with the manufacturer's instructions: "Refill units should be stored in a dry place and kept in the carton until used". An investigation into the two recent miscoordination occurrences led to the discovery that moisture had caused the boric acid material to swell such that the fuse fault clearing mechanism would not operate properly (called "bore closedown").</p> <p>The corrective actions generated as a result of this event will aide in the prevention of a recurrence of this nature.</p>
Operating Conditions:	At the time of the occurrence, normal electrical operations.
Activity Category:	Normal Operations (other than Activities specifically listed in this Category)
Immediate Action(s):	<ol style="list-style-type: none"> 1. I&S issued NCR #2007-NCR-330014 for I&S affected equipment and each facility will need to issue an NCR for their affected equipment. 2. WSRC to issue a Safety Alert concerning this event
FM Evaluation:	Infrastructure and Services issued a standing order (I&S-SO-07-0004) to establish the administrative controls to implement until all identified SM4 and SM5 fuses have been replaced across the site. In addition, nonconformance reports were issued by each site user identifying the location and status of all SM4 and SM5 fuses. The only acceptable final

	disposition for the NCR's will be the replacement of the identified fuses with acceptable spares.	
DOE Facility Representative Input:		
DOE Program Manager Input:		
Further Evaluation is Required:	No	
Division or Project:	M&O/I&S/Utilites & Operations	
Plant Area:	Site Wide	
System/Building/Equipment:	Electrical Distribution / fuses	
Facility Function:	Balance-of-Plant - Site/outside utilities	
Corrective Action 01:	Target Completion Date: 08/17/2007	Tracking ID: 2007-CTS-009016, CA 3-18, inclusive
	<p>Issue an NCR for all S&C SM4 and SM5 fuses installed within their facilities to track the identification and application of NCR controls for their affected equipment. An engineering evaluation using the list of SM4 and SM5 fuse locations (attachment 2 of this record) will need to be performed to identify equipment whose immediate upstream protection is provided by an SM4 or SM5 fuse.</p> <p>To disposition the NCRs, the SM5 or SM4 fuses will have to be replaced. A conditional release to operate the affected equipment could be allowed if the arc flash calculation is revised to use the overcurrent device upstream of the SM4/SM5 fuse. (Note: A separate action item will be issued to each site user of this type equipment)</p>	
Corrective Action 02:	Target Completion Date: 09/07/2007	Tracking ID: 2007-CTS-009016, CA 19
	Complete a comparison between the issued NCRs and the SM4/5 Master List to ensure that all fuses for the listed Pole/Switchgear Numbers and Protected Transformers are evaluated.	
Corrective Action 03:	Target Completion Date: 08/09/2007	Tracking ID: 2007-CTS-008631, CA# 3
	Examine installation, maintenance, and storage practices. Involve S&C (vendor) in this examination and look at all expulsion fuses (SM5, SM4, SMD20, and XS). Revise procedures, maintenance and storage practices based on results of examination.	
Corrective Action 04:	Target Completion Date: 11/12/2007	Tracking ID: 2007-CTS-008631, CA# 7
	Implement inspection program for stored fuses as appropriate based on QA, Engineering and Operations input.	

Corrective Action 05:	Target Completion Date: 09/05/2007	Tracking ID: 2007-CTS-008631, CA# 8												
	Organize storage building and truck storage to ensure that fuses are properly stored to minimize handling damage to the fuse package.													
Lessons(s) Learned:	WSRC issued lessons learned 2007-LL-0062, "S&C SM4 and SM5 Sitewide Fuse Problem (Submitted by Infrastructure and Services Engineering)" First Alert on August 8, 2007. This Lessons Learned was added to the WSRC Operating Experience Program and the actions pertaining to the Lessons Learned will be tracked in STAR record 2007-CTS-009052.													
HQ Keywords:	01E--Inadequate Conduct of Operations - Operations Procedure Noncompliance 07E--Electrical Systems - Electrical Equipment Failure 12C--EH Categories - Electrical Safety 13A--Management Concerns - HQ Significant (High-lighted for Management attention) 14E--Quality Assurance - Work Process Deficiency													
HQ Summary:	An investigation into two recent, but non-related, occurrences involving 13.8 KV electrical line distribution fuses led to the discovery that moisture had caused the boric acid material to swell, causing the fuse fault clearing mechanism not to operate properly. In this condition, the backup overcurrent device must operate to clear any fault downstream of the fuse. As a result, any arc flash calculations that depended on the line distribution fuses are now indeterminate. A safety alert will be issued.													
Similar OR Report Number:	1. None													
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td>Dane Anderson</td> </tr> <tr> <td>Phone</td> <td>(803) 557-8086</td> </tr> <tr> <td>Title</td> <td>Manager, Utilities & Operations</td> </tr> </table>		Name	Dane Anderson	Phone	(803) 557-8086	Title	Manager, Utilities & Operations						
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Phone	(803) 557-8086													
Title	Manager, Utilities & Operations													
Originator:	<table border="1"> <tr> <td>Name</td> <td>STONE, ROBERT W</td> </tr> <tr> <td>Phone</td> <td>(803) 557-9255</td> </tr> <tr> <td>Title</td> <td>ISSUE COORDINATOR</td> </tr> </table>		Name	STONE, ROBERT W	Phone	(803) 557-9255	Title	ISSUE COORDINATOR						
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Date	Time	Person Notified	Organization											
08/07/2007	16:35 (ETZ)	JJ Hynes	DOE-SR											
08/07/2007	16:35 (ETZ)	Terri Bolton	WSRC											
Authorized Classifier(AC):	Robert W. Stone Date: 09/24/2007													

6)Report Number: [NA--KCSO-AS-KCP-2007-0008](#) After 2003 Redesign

Secretarial Office:	National Nuclear Security Administration		
Lab/Site/Org:	Kansas City Plant		
Facility Name:	Kansas City Plant		
Subject/Title:	Minor Electrical Shock from Damaged Fluorescent Light Clip		
Date/Time Discovered:	08/13/2007 06:30 (CTZ)		
Date/Time Categorized:	08/13/2007 12:15 (CTZ)		
Report Type:	Notification/Final		
Report Dates:	Notification	08/14/2007	15:51 (ETZ)
	Initial Update	08/14/2007	15:51 (ETZ)
	Latest Update	08/14/2007	15:51 (ETZ)
	Final	08/14/2007	15:51 (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:	A2B6C01 - Equipment/ material problem; Defective, Failed or Contaminated; Defective or failed part		
ISM:	6) N/A (Not applicable to ISM Core Functions as determined by management review.)		
Subcontractor Involved:	No		
Occurrence Description:	Employee reached to turn a rocker switch controlling a fluorescent lighting fixture mounted under an office binder bin to the ON position. Adjacent lamp clip had broken plastic tip, exposing metal lamp component. Employee's finger brushed against the exposed metal, resulting in minor electrical tingle.		
Cause Description:	Desk lighting fixture had cracked and missing plastic tip.		
Operating Conditions:	Normal		
Activity Category:	Normal Operations (other than Activities specifically listed in this Category)		
Immediate Action(s):	Maintenance repair request submitted to repair fixture. Incident investigation initiated.		
	The categorization of this occurrence has been coordinated with Ken Roggenkamp, National Nuclear Security Administration, Kansas City Site Office.		
FM Evaluation:			
DOE Facility Representative			

Input:									
DOE Program Manager Input:									
Further Evaluation is Required:	No								
Division or Project:	Division 800, Department 893								
Plant Area:	FJ-41 (Fact. floor)								
System/Building/Equipment:	Steelcase Fluorescent Lighting Fixture								
Facility Function:	Balance-of-Plant - Offices								
Corrective Action:									
Lessons(s) Learned:	Due to the proximity of the rocker switch to the lamp clip, a review should be performed to identify desk lighting fixtures with potentially similar broken clips.								
HQ Keywords:	05D--Mechanical/Structural - Mechanical Equipment Failure/Damage 08A--OSHA Reportable/Industrial Hygiene - Electrical Shock 12C--EH Categories - Electrical Safety 14L--Quality Assurance - No QA Deficiency								
HQ Summary:	An employee experienced a minor shock while turning on a desk light fixture. The fixture had a crack in it, and the employee's finger brushed against exposed metal. No injury was reported.								
Similar OR Report Number:									
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td>Donald J. Fitzpatrick</td> </tr> <tr> <td>Phone</td> <td>(816) 997-5899</td> </tr> <tr> <td>Title</td> <td>Manager, ES&H Operations</td> </tr> </table>	Name	Donald J. Fitzpatrick	Phone	(816) 997-5899	Title	Manager, ES&H Operations		
Name	Donald J. Fitzpatrick								
Phone	(816) 997-5899								
Title	Manager, ES&H Operations								
Originator:	<table border="1"> <tr> <td>Name</td> <td>TAYLOR, LINDA M</td> </tr> <tr> <td>Phone</td> <td>(816) 997-3747</td> </tr> <tr> <td>Title</td> <td>ES&H COORDINATOR</td> </tr> </table>	Name	TAYLOR, LINDA M	Phone	(816) 997-3747	Title	ES&H COORDINATOR		
Name	TAYLOR, LINDA M								
Phone	(816) 997-3747								
Title	ES&H COORDINATOR								
HQ OC Notification:	<table border="1"> <tr> <td>Date</td> <td>Time</td> <td>Person Notified</td> <td>Organization</td> </tr> <tr> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> </tr> </table>	Date	Time	Person Notified	Organization	NA	NA	NA	NA
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Date	Time	Person Notified	Organization						
08/13/2007	12:22 (CTZ)	Patrick Hoopes	NNSA						
Authorized Classifier(AC):	Greg Jackson Date: 08/14/2007								

7)Report Number:	NA--KCSO-AS-KCP-2007-0011 After 2003 Redesign
Secretarial Office:	National Nuclear Security Administration
Lab/Site/Org:	Kansas City Plant
Facility Name:	Kansas City Plant

Subject/Title:	Accidental Core Drilling into an Embedded Electrical Conduit		
Date/Time Discovered:	08/24/2007 14:00 (CTZ)		
Date/Time Categorized:	08/29/2007 15:00 (CTZ)		
Report Type:	Final		
Report Dates:	Notification	09/04/2007	17:04 (ETZ)
	Initial Update	11/28/2007	15:01 (ETZ)
	Latest Update	11/28/2007	15:01 (ETZ)
	Final	11/28/2007	15:01 (ETZ)
Significance Category:	3		
Reporting Criteria:	<p>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.</p> <p>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)</p>		
Cause Codes:	A1B2C08 - Design/Engineering Problem; Design output LTA; Errors not detectable		
ISM:	2) Analyze the Hazards		
Subcontractor Involved:	No		
Occurrence Description:	<p>On August 27, 2007, the discovery of contact with an embedded electrical conduit by a drill coring bit was confirmed at the Kansas City Plant (KCP). Investigation by a Honeywell Federal Manufacturing and Technologies Kansas City (FM&T/KC) Safety Engineer discovered an electrical conduit not detected during an authorized utility locate scan was contacted by a drill's coring bit during a January 23, 2007 construction activity. A three-inch hole was being drilled in concrete flooring for the installation a two-inch chilled water line. The affected floor area was scanned on January 18, 2007 using both a Hilti and Zircon meter. Slab scans detected a consistent cross-bracing rebar pattern, with no other utilities detected. This drilling was completed in January 2007.</p> <p>No visible, audible or similar electrical-like event occurred to indicate this conduit contained any energized conductors. No injuries were reported from this January 2007 incident.</p>		

Cause Description:	<p>Direct Cause: An electrical conduit was contacted by a drill's coring bit.</p> <p>Root Cause: The conduit was completely shadowed by large rebar and a second rebar.</p>
Operating Conditions:	Three inch core drilling following an authorized utility locate scan.
Activity Category:	Maintenance
Immediate Action(s):	<p>Immediately following the January 2007, contact, the work was stopped and significant efforts made for two days to determine the exact source of destination of this conduit. After a detailed review, no impact or hazards of any sort were identified. The conduit was believed to be abandoned, since the building had previously been emptied and sat idle for numerous years.</p> <p>In August 2007, FM&T/KC Maintenance was called to investigate the inoperability of two air handling units. While tracing out the problem, the damaged conduit was determined to be part of these circuits. Further investigation found the source of the conduit and circuit was in a GE 8000 Line Control Center (600 A). Once determined to be associated with the conduit damaged in the January 2007 drilling the branch circuits were placed under Lockout/Tagout (LOTO). Investigation found that two phases had blown fuses indicating they were likely energized at the time of the core drilling contact.</p> <p>Categorization of this occurrence report was coordinated with Ken Roggenkamp, Kansas City Site Office, National Nuclear Security Administration.</p> <p>This report has been reviewed and determined to be unclassified by: Authorized Derivative Classifier: Clyde E. Hicks Title: Emergency Management Specialist Date: November 28, 2007</p>
FM Evaluation:	<p>Based on the FM&T/KC Safety review no procedural or safe work practices were violated.</p> <p>Electrical safety remains a significant focus area for the Kansas City Plant. An email with a detailed attachment was sent on August 28, 2007 to share this event with the workers in the impacted building and with FM&T/KC Maintenance employees. The event information was shared with subcontractors (Powerpoint presentation) at the September 11, 2007 FM&T/KC subcontractor Superintendent meeting.</p> <p>These actions will increase awareness of this issue (contact with embedded conduits) and the need to promptly report any suspect electrical occurrence to FM&T/KC line management and to the FM&T/KC Health, Safety and Environment Department.</p>

DOE Facility Representative Input:			
DOE Program Manager Input:			
Further Evaluation is Required:	No		
Division or Project:	Honeywell Federal Mfg. & Technologies Kansas City		
Plant Area:	East Building		
System/Building/Equipment:	Electrical 480-VAC conduit, three-inch core drill		
Facility Function:	Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)		
Corrective Action 01:	<table border="1"> <tr> <td>Target Completion Date:08/28/2007</td> <td>Actual Completion Date:08/28/2007</td> </tr> </table>	Target Completion Date: 08/28/2007	Actual Completion Date: 08/28/2007
Target Completion Date: 08/28/2007	Actual Completion Date: 08/28/2007		
	Provide information from this incident to FM&T/KC maintenance personnel.		
Corrective Action 02:	<table border="1"> <tr> <td>Target Completion Date:09/11/2007</td> <td>Actual Completion Date:09/11/2007</td> </tr> </table>	Target Completion Date: 09/11/2007	Actual Completion Date: 09/11/2007
Target Completion Date: 09/11/2007	Actual Completion Date: 09/11/2007		
	Provide information regarding this incident at the September 11,2007 KCP subcontractor Superintendent meeting.		
Lessons(s) Learned:	Maintenance workers must be aware of the potential for contact with embedded conduits and the need to promptly report any suspect electrical occurrences in the ORPS.		
HQ Keywords:	01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control 07D--Electrical Systems - Electrical Wiring 08F--OSHA Reportable/Industrial Hygiene - Industrial Operations Issues 08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical) 12C--EH Categories - Electrical Safety 13A--Management Concerns - HQ Significant (High-lighted for Management attention) 14D--Quality Assurance - Documents and Records Deficiency 14E--Quality Assurance - Work Process Deficiency		
HQ Summary:	While investigating the inoperability of two air handling units, a damaged embedded conduit was found. Investigative efforts determined the conduit		

	contained conductors that were part of a 600 amp circuit in a GE 8000 Line Control Center which was damaged during core drilling in January 2007. Two phases of the circuits had blown fuses indicating they were likely energized at the time of the core drilling. The circuits were placed under a lockout/tagout.			
Similar OR Report Number:	1. NE-CH-AA-ANLW-EBR-1991-0004			
Facility Manager:	Name	Curt Valle		
	Phone	(816) 997-2896		
	Title	Health, Safety and Environment Manager		
Originator:	Name	HICKS, CLYDE E		
	Phone	(816) 997-2262		
	Title	EMERGENCY MGT SPECIALIST		
HQ OC Notification:	Date	Time	Person Notified	Organization
	NA	NA	NA	NA
Other Notifications:	Date	Time	Person Notified	Organization
	08/24/2007	14:00 (CTZ)	NNSA	KCSO
Authorized Classifier(AC):	Clyde E. Hicks Date: 11/28/2007			

8)Report Number:	NA--LSO-LLNL-LLNL-2007-0038 After 2003 Redesign		
Secretarial Office:	National Nuclear Security Administration		
Lab/Site/Org:	Lawrence Livermore National Lab.		
Facility Name:	Lawrence Livermore Nat. Lab. (BOP)		
Subject/Title:	Mild electrical shock while plugging in soldering iron in Building 231		
Date/Time Discovered:	08/14/2007 10:45 (PTZ)		
Date/Time Categorized:	08/14/2007 11:45 (PTZ)		
Report Type:	Notification/Final		
Report Dates:	Notification	08/16/2007	18:29 (ETZ)
	Initial Update	08/16/2007	18:29 (ETZ)
	Latest Update	08/16/2007	18:29 (ETZ)
	Final	08/16/2007	18:29 (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:	A2B6C01 - Equipment/ material problem; Defective, Failed or Contaminated; Defective or failed part
ISM:	3) Develop and Implement Hazard Controls
Subcontractor Involved:	No
Occurrence Description:	<p>On the morning of August 14, 2007, in Building 231, an employee experienced a mild shock when plugging a soldering iron into a multi-outlet box. The employee contacted his supervisor and reported feeling a shock from his hand to elbow. The employee underwent medical tests and observation and was released to work without restrictions.</p> <p>An inspection of the scene resulted in the discovery that the insulation for the soldering iron's cord was cracked. Because of this crack the employee contacted the conductors in the cord and received the shock. The multi-outlet box was de-energized and the soldering iron unplugged and tagged.</p>
Cause Description:	The cord/plug connection on the soldering iron was cracked/frayed.
Operating Conditions:	Normal
Activity Category:	Normal Operations (other than Activities specifically listed in this Category)
Immediate Action(s):	The employee was taken to medical for observation and evaluation. The multi-outlet box was de-energized and the soldering iron unplugged and tagged.
FM Evaluation:	This event is an opportunity to reemphasize the importance of checking the condition of hand tools in general and especially prior to use.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	No
Division or Project:	ENG
Plant Area:	Site 200
System/Building/Equipment:	B231/Soldering Iron
Facility Function:	Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)
Corrective Action:	
Lessons(s) Learned:	It is important for workers to regularly check the condition of hand tools. Manager walkarounds also could serve as an opportunity to check on the condition of older/frequently used hand tools.
HQ Keywords:	07D--Electrical Systems - Electrical Wiring 08A--OSHA Reportable/Industrial Hygiene - Electrical Shock 12C--EH Categories - Electrical Safety

	14H--Quality Assurance - Inspection and Acceptance Testing Deficiency															
HQ Summary:	An employee in Building 231 experienced a mild shock when plugging in a soldering iron. He reported the shock to his supervisor, and underwent medical tests and observation, and was released to work without restrictions. Inspection of the soldering iron revealed that the cord was cracked, causing the employee to contact the conductor in the cord. The soldering iron has been tagged out.															
Similar OR Report Number:																
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td colspan="3">Bob Dillman</td> </tr> <tr> <td>Phone</td> <td colspan="3">(925) 422-8351</td> </tr> <tr> <td>Title</td> <td colspan="3">Assurance Manager--Engineering Directorate</td> </tr> </table>				Name	Bob Dillman			Phone	(925) 422-8351			Title	Assurance Manager--Engineering Directorate		
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Title	Assurance Manager--Engineering Directorate															
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Date	Time	Person Notified	Organization													
08/14/2007	12:00 (PTZ)	John Ratelle	LSO													
Authorized Classifier(AC):	Thomas Anklam Date: 08/16/2007															

9)Report Number:	NA--SS-SNL-1000-2007-0015 After 2003 Redesign														
Secretarial Office:	National Nuclear Security Administration														
Lab/Site/Org:	Sandia National Laboratories - SS														
Facility Name:	SNL Division 1000														
Subject/Title:	Miswired Battery Charger Melts Wires														
Date/Time Discovered:	08/06/2007 09:19 (MTZ)														
Date/Time Categorized:	08/10/2007 13:00 (MTZ)														
Report Type:	Notification/Final														
Report Dates:	<table border="1"> <tr> <td>Notification</td> <td>08/13/2007</td> <td>17:54 (ETZ)</td> </tr> <tr> <td>Initial Update</td> <td>08/13/2007</td> <td>17:54 (ETZ)</td> </tr> <tr> <td>Latest Update</td> <td>08/13/2007</td> <td>17:54 (ETZ)</td> </tr> <tr> <td>Final</td> <td>08/13/2007</td> <td>17:54 (ETZ)</td> </tr> </table>			Notification	08/13/2007	17:54 (ETZ)	Initial Update	08/13/2007	17:54 (ETZ)	Latest Update	08/13/2007	17:54 (ETZ)	Final	08/13/2007	17:54 (ETZ)
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Initial Update	08/13/2007	17:54 (ETZ)													
Latest Update	08/13/2007	17:54 (ETZ)													
Final	08/13/2007	17:54 (ETZ)													
Significance Category:	4														
Reporting Criteria:	4C(3) - Discovery of any defective item or material, other than a suspect/counterfeit item or material, in any application whose failure could result in a loss of safety function, or present a hazard to public or worker														

	<p>health and safety.</p> <p>A defective item or material is any item or material that does not meet the commercial standard or procurement requirements as defined by catalogues, proposals, procurement specifications, design specifications, testing requirements, contracts, or the like. It does not include parts or services that fail or are otherwise found to be inadequate because of random failures or errors within the accepted reliability level.</p>
Cause Codes:	<p>A2B3C02 - Equipment/ material problem; Inspection/ testing LTA; Inspection/ testing LTA</p> <p>A2B5C02 - Equipment/ material problem; Procurement control LTA; Fabricated item does not meet requirements</p> <p>A2B6C01 - Equipment/ material problem; Defective, Failed or Contaminated; Defective or failed part</p>
ISM:	<p>2) Analyze the Hazards</p> <p>3) Develop and Implement Hazard Controls</p> <p>4) Perform Work Within Controls</p>
Subcontractor Involved:	<p>Yes</p> <p>Lift-o-Matic</p>
Occurrence Description:	<p>This incident was initially a Non-Occurrence Trackable Event (NOTE) Sandia's version of a DOE non-reportable event. The NOTE was elevated to an Occurrence on August 10, 2007. (The NOTE will be cancelled.) The incident was determined to fit the given Occurrence reporting criteria after talking with the SNL Fleet Services person who had actually inspected the battery charger. Facility Manager /Designee was unable to reach that person prior to August 10, 2007.</p> <p>On August 6, 2007, an odor like melting plastic was detected in an 858N hallway. Personnel in the vicinity noted a battery charger with melting wires. The charger had been connected to a drum lifter that was powered by two, 12-Volt batteries. The personnel unplugged the charger from the wall and notified the 858N site Emergency Response Team. Team members moved the charger outdoors so that the odor would dissipate, administratively locked the lifter, and cordoned off the lifter with yellow "caution" tape.</p> <p>The charger was supplied with the lifter by the lifter manufacturer. On May 1, 2007, SNL Fleet Services Org. 10265-1 had inspected and serviced lifter and the charger prior to its initial use in 858N. As the lifter had arrived at Fleet Services fully charged, workers did not use the charger to charge the lifter. They had inspected the charger by plugging it into a wall socket and observed that it was operational. They did not connect the charger to the lifter. More-thorough inspection of the charger and testing of the charger while actually connected to batteries might have revealed its deficiencies. Fleet Services also performed a "counterfeit inspection" where they looked for counterfeit bolts and for any other obvious counterfeit parts.</p>

	<p>After the charger was disconnected, it was noted that the cord installed on the charger by the lifter manufacturer had been wired backwards, with the red (positive) wire connected to the negative terminal of the cord end. The charger was to have "reverse polarity protection;" however, it was determined that this protection would work only if the charger were used in automatic mode, instead of the manual mode used by the personnel who were charging the lifter. The charger manual did not give details on polarity protection as to if it works or not in manual mode, and the charger manufacturer indicated that the polarity protection should have worked in either mode. The charger itself was Underwriters Laboratories Inc.-(UL-)approved; however, this approval was negated when the lifter manufacturer altered the unit by removing the original cord with alligator clips and installing on the unit a cord with a standard 24-V connector end.</p> <p>SNL Electrical Safety personnel viewed the charger with melted wires and stated that it should be sent back to the lifter manufacturer for analysis.</p>
Cause Description:	Methodology - Critique Fact Finding
	<p>A2B3C02 Inspection/testing less than adequate--SNL Fleet Services did not perform a thorough test of the battery charger. The equipment (drum lifter) it came with was already charged, so the charger was merely turned on to see if it was operational. The charger was not actually connected to a battery to ensure it was working properly. In addition, non-NRTL testing should have been performed on the charger by Line personnel.</p> <p>A2B5C02 Fabricated item did not meet requirements--probably due to incorrect wiring, the charger did not function as it was supposed to. In addition, the Underwriters Laborator Inc. (UL) approval had been negated when the cord was wired to the charger by the drum-lifter company.</p> <p>A2B6C01 Defective or failed part--the charger may have failed because it had been incorrectly wired by the drum-lifter company.</p>
Operating Conditions:	Normal
Activity Category:	Maintenance
Immediate Action(s):	<ol style="list-style-type: none"> 1. Faulty equipment (battery charger) was unplugged and moved outdoors. 2. Site Emergency Response Team was activated. 3. Primary equipment (drum-lifter) was placed out-of-service pending inspection for damage. 4. Drum-lifter was administratively locked and cordoned off with yellow "caution" tape.

	<p>5. SNL Fleet Services was contacted for information on work performed on the lifter before its use in 858N.</p> <p>6. Administrative lock was removed and Fleet Service personnel inspected and tested the lifter and stated that no damage had been done from the charger failure.</p> <p>7. Lifter was placed back into service as far as the charger issue was concerned (there were other maintenance issues with it).</p> <p>8. SNL Electrical Safety inspected the lifter and the charger and said that the charger should be sent back to drum-lifter manufacturer.</p>			
FM Evaluation:	<p>Early Notification Dates and Times: (OR) EOC 8/10/07, 15:15 FR - Janelle Armijo-Sanchez, 8/10/07, 13:51</p> <p>Early Notification Dates and Times: (NOTE) EOC 8/6/07, 10:47 FR - Janelle Armijo-Sanchez, 8/6/07, 10:35</p> <p>Improved work controls may have prevented this incident. A more thorough inspection of the battery charger by SNL Fleet Services might have found the incorrect wiring. Even though the charger itself had been UL-approved, users failed to recognize that the UL approval would have been negated by installation of a cord other than the one that came with the unit (even though the drum lifter manufacturer had installed the cord). The standard SNL non-NRTL inspection would have detected the wiring error.</p>			
DOE Facility Representative Input:				
DOE Program Manager Input:				
Further Evaluation is Required:	No			
Division or Project:	1000/Microsystems Science, Technology & Components			
Plant Area:	Tech Area I			
System/Building/Equipment:	Battery charger for Lift-o-Matic drum lifter/Bldg. 858N			
Facility Function:	Laboratory - Research & Development			
Corrective Action 01:	<table border="1"> <tr> <td>Target Completion Date:08/22/2007</td> <td>Actual Completion Date:08/15/2007</td> </tr> </table>		Target Completion Date: 08/22/2007	Actual Completion Date: 08/15/2007
Target Completion Date: 08/22/2007	Actual Completion Date: 08/15/2007			
	Department 1741-1 - Will contact SNL Fleet Services Team Leader to suggest more thorough inspections of peripheral equipment, such as battery chargers, while performing inspections prior to future equipment's being			

	brought into service. (A2B3C02)			
Corrective Action 02:	Target Completion Date:08/24/2007		Actual Completion Date:08/16/2007	
	Department 1746 - Obtain new battery charger to be supplied and re-wired by SNL Fleet Services. (A2B5C02, A2B6C01)			
Corrective Action 03:	Target Completion Date:08/31/2007		Actual Completion Date:08/21/2007	
	Department 1741-1 - Send battery charger back to drum lifter manufacturer. (A2B5C02, A2B6C01)			
Corrective Action 04:	Target Completion Date:08/31/2007		Actual Completion Date:08/28/2007	
	Department 1746 - Perform SNL method non-Nationally Recognized Testing Laboratory (non-NRTL) inspection on drum lifter and on new battery charger (. (A2B3C02)			
Lessons(s) Learned:				
HQ Keywords:	07D--Electrical Systems - Electrical Wiring 07E--Electrical Systems - Electrical Equipment Failure 11H--Other - Procurement Deficiency/Defective Items 12C--EH Categories - Electrical Safety 14E--Quality Assurance - Work Process Deficiency 14G--Quality Assurance - Procurement Deficiency 14H--Quality Assurance - Inspection and Acceptance Testing Deficiency			
HQ Summary:	While investigating an odor like melting plastic, workers discovered melted wires on a battery charger in the 858N hallway. The battery charger had been connected to a drum lifter that was powered by two 12-Volt batteries. Personnel unplugged the charger from the wall and the lifter was administratively locked. SNL Electrical Safety personnel viewed the charger with melted wires and stated that it should be sent back to the lifter manufacturer for analysis. The lifter was not damaged.			
Similar OR Report Number:				
Facility Manager:	Name	Sally Douglas		
	Phone	(505) 844-0568		
	Title	ESS&H Coordinator/Team Supervisor		
Originator:	Name	LUCERO, JEWELLEE A		
	Phone	(505) 845-4727		
	Title	REPORTING ADMINISTRATOR		
HQ OC Notification:	Date	Time	Person Notified	Organization
	NA	NA	NA	NA

Other Notifications:	Date	Time	Person Notified	Organization
	08/06/2007	09:19 (MTZ)	Sally Douglas	1741-1
	08/06/2007	10:39 (MTZ)	Bess Campbell-Domme	1000
	08/10/2007	13:51 (MTZ)	Janelle Armijo-Sanchez, FR	DOE/SSO
	08/10/2007	14:28 (MTZ)	Ron Jones	1741
	08/10/2007	14:28 (MTZ)	Rom Zipperian	1740
	08/10/2007	14:28 (MTZ)	Gil Herrera	1700

Authorized Classifier(AC): Sally Douglas Date: 08/13/2007

10)Report Number:	NA--SS-SNL-5000-2007-0003 After 2003 Redesign		
Secretarial Office:	National Nuclear Security Administration		
Lab/Site/Org:	Sandia National Laboratories - SS		
Facility Name:	SNL Division 5000		
Subject/Title:	Employee Cut an Energized Power Cord in Bldg. 962		
Date/Time Discovered:	08/20/2007 15:30 (MTZ)		
Date/Time Categorized:	08/20/2007 16:05 (MTZ)		
Report Type:	Final		
Report Dates:	Notification	08/21/2007	18:16 (ETZ)
	Initial Update	09/17/2007	18:09 (ETZ)
	Latest Update	09/17/2007	18:09 (ETZ)
	Final	09/17/2007	18:09 (ETZ)
Significance Category:	3		
Reporting Criteria:	<p>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.</p> <p>10(3) - A near miss, where no barrier or only one barrier prevented an event from having a reportable consequence. One of the four significance categories should be assigned to the near miss, based on an evaluation of the potential risks and the corrective actions taken. (1 of 4 criteria - This is a SC 3 occurrence)</p>		
Cause Codes:	<p>A3B1C03 - Human Performance Less Than Adequate (LTA); Skill Based Errors; Incorrect performance due to mental lapse -->couplet - A2B4C06 - Equipment/ material problem; Material control LTA; Unauthorized material substitution</p>		

	A6B1C03 - Training deficiency; No Training Provided; Work incorrectly considered "skill-of-the-craft"
ISM:	1) Define the Scope of Work 4) Perform Work Within Controls
Subcontractor Involved:	No
Occurrence Description:	At 3:30 pm on Monday, 8/20/2007, an employee cut an energized power cord in Tech Area IV, Building 962, Room 2005. The employee had been tasked to replace six laser table power strips. Because some of the power cords were not long enough to reach the wall receptacle, the employee also acquired power cords that would be long enough. The employee successfully replaced five power strips, one of which needed longer power cords. The employee was working on the last strip/cord when the accident happened. To determine how long the power cord had to be, the employee plugged it into the wall receptacle and physically tracked it across the room (across multiple angles and obstructions) to where the power strip was, marking the required length. The employee went to a workbench, forgot to unplug the cord, and cut the cord with shears. The metal shears shorted the hot lead to the neutral/ground. The shears took the brunt of the current. The short tripped the circuit breaker. Thus, the employee quickly "discovered/recognized" the problem. The employee immediately reported the OOPS to his manager. The employee was taken to Medical for evaluation and was released to return to work with no injuries incurred. There was no damage to the environment.
Cause Description:	A3B1C03- Human performance less than adequate; skill based error; Incorrect performance due to mental lapse. Employee cut the (energized) cord in a lapse of judgment. Couplet A2B4C06; Equipment/material problem; Material control less than adequate; unauthorized material substitution. The power strips in the as-bought Newport laser tables were not UL listed and needed to be replaced. A6B1C03- Training deficiency; No training provided; Work incorrectly considered "skill of the craft." There was training relative to electrical safety but not relative to the CPRs that do not allow for modifications of power strips. Methodology: Events and causal factor analysis.
Operating Conditions:	Normal
Activity Category:	Research
Immediate Action(s):	Unplugged extension cord. Employee contacted the employee's manager and the manager performed OOPS notification. Employee was taken (driven by someone else) to Medical. Tested wall receptacle for power, discovered that it was de-energized, and a work order was placed to reset the circuit breaker.
FM Evaluation:	Early Notification Dates and Times: EOC - 8/20/07 - 15:53

	FR - Gary Schmidtke - 8/20/07 - 1700 SSO - Dan Dilley - 8/20/07 - 16:19	
	The effect of this occurrence on the specific program and projects where this event occurred was minor since no injury was sustained. We did suspend electrical operations in this room until the conclusion of causal analysis. Corrective actions should mitigate reoccurrence of this event.	
DOE Facility Representative Input:		
DOE Program Manager Input:		
Further Evaluation is Required:	No	
Division or Project:	5000/Photoconductive Semiconductor Switch Project	
Plant Area:	Tech Area IV	
System/Building/Equipment:	Power strip, ext. cord, 120 VAC wall receptacle/Bldg. 962	
Facility Function:	Laboratory - Research & Development	
Corrective Action 01:	Target Completion Date: 09/06/2007	Actual Completion Date: 09/06/2007
	Department 5443 - Purchase UL listed power strips with 25' long cords. (A2B4C06)	
Corrective Action 02:	Target Completion Date: 09/10/2007	Actual Completion Date: 09/10/2007
	Department 5443 - Counsel the employee on employee safety responsibilities and accountability for their actions. Re-train employee on electrical safety (ELC106R). (A3B1C03)	
Corrective Action 03:	Target Completion Date: 09/10/2007	Actual Completion Date: 09/10/2007
	Department 5443 - Hold mandatory Organization 5443 safety meeting (SAF110) to discuss the incident, electrical safety, applicable regulatory requirements, lessons learned, and the dangers of the specific equipment. (A6B1C03)	
Corrective Action 04:	Target Completion Date: 09/10/2007	Actual Completion Date: 09/10/2007
	Department 5443 - Share this Lessons Learned through the SNL Corp. Lesson Learned process. The Division 5000 VP will disseminate this Lesson Learned with all Division 5000 Managers as an opportunity to share this electrical incident and attach a PowerPoint presentation on Management Responsibilities in Preventing and Responding to Incidents. (A6B1C03)	

Corrective Action 05:	Target Completion Date: 11/01/2007	Actual Completion Date: 09/20/2007
	Department 5443 - Install UL listed power strips with 25' long cords in building 962, room 2005. (A2B4C06)	
Lessons(s) Learned:	<p>Title: Modifications of power strips tested by a Nationally Recognized Testing Laboratory</p> <p>Lesson Learned Statement: Modification of power strips tested by a NRTL is not in accordance with CPRs. CPR 400.1.1.28 Section 2.12 states: "Use only unmodified extension cords and power strips that are labeled by a nationally recognized testing laboratory (NRTL)." This requirement has been extracted from OSHA Standard, 29 CFR 1910, Subpart S, and 29 CFR 1926, Subpart K, Electrical and Subpart V, Power Transmission and Distribution.</p> <p>Discussion of Activities: Organization 5440 stopped using all the modified power strips. They also decided to replace the modified power strips with 25' UL listed power strips. The employee was counseled on employee safety responsibilities and accountability for his actions. The employee was re-trained on electrical safety (ELC106R). Organization 5443 held a mandatory safety meeting (SAF110) to discuss the incident, electrical safety, applicable regulatory requirements, lessons learned, and the dangers of the specific equipment. The Department Manager of 5443, will share the Lessons Learned from this electrical incident with LIWG on Sept. 19. The Manager will also write an article on Lessons Learned for our next Div. 5000 Quarterly Newsletter, due Dec. 07. SNL shared this Lessons Learned through the Corp. Lesson Learned process after the occurrence report was submitted. Div. 5000 VP emailed (9/10/07) a message to all Div. 5000 Mgrs. as an opportunity to sharing this electrical incident and attached a PowerPoint presentation on Mgmt. Responsibilities in Preventing and Responding to Incidents.</p> <p>Recommended Actions: Purchase NRTL listed power strips, refrain from modifying them, employee counseling, department meetings, lessons learned will be distributed, presentation to the LIWG, and management (level 1 through VP) emails to staff.</p>	
HQ Keywords:	01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous) 01F--Inadequate Conduct of Operations - Training Deficiency 01Q--Inadequate Conduct of Operations - Personnel error 08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance 08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical) 11H--Other - Procurement Deficiency/Defective Items	

	12K--EH Categories - Near Miss (Could have been a serious injury or fatality) 14B--Quality Assurance - Training and Qualification Deficiency 14E--Quality Assurance - Work Process Deficiency 14G--Quality Assurance - Procurement Deficiency																																			
HQ Summary:	An employee cut an energized power cord in area IV, building 962, Room 2005 while replacing laser table power strips. The task required cutting power cords to the appropriate length for some of the power strips. The employee had plugged one power cord into a wall receptacle and tracked it across the room to where the power strip was, marking the required length. The employee went to a workbench, forgot to unplug the cord, and cut the cord with shears, tripping the circuit breaker. The employee immediately reported the incident, and was taken to medical for evaluation and released to return to work with no injuries.																																			
Similar OR Report Number:	1. NA--SS-SNL-4000-2007-0001																																			
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td colspan="3">Walt Nickerson</td> </tr> <tr> <td>Phone</td> <td colspan="3">(505) 845-7241</td> </tr> <tr> <td>Title</td> <td colspan="3">Center 5400 ES&H Coordinator</td> </tr> </table>				Name	Walt Nickerson			Phone	(505) 845-7241			Title	Center 5400 ES&H Coordinator																						
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08/20/2007	16:19 (MTZ)	Dan Dilley, SSO	DOE/SSO																																	
Authorized Classifier(AC):	Guillermo M. Loubriel Date: 08/21/2007																																			

11)Report Number:	NA--SS-SNL-CASITE-2007-0004 After 2003 Redesign
Secretarial Office:	National Nuclear Security Administration
Lab/Site/Org:	Sandia National Laboratories - Livermore
Facility Name:	SNL California Site

Subject/Title:	B968 Chiller Pump Replacement		
Date/Time Discovered:	08/06/2007 11:30 (PTZ)		
Date/Time Categorized:	08/06/2007 13:30 (PTZ)		
Report Type:	Final		
Report Dates:	Notification	08/08/2007	12:31 (ETZ)
	Initial Update	09/20/2007	18:23 (ETZ)
	Latest Update	09/20/2007	18:23 (ETZ)
	Final	09/20/2007	18:23 (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:	A4B1C01 - Management Problem; Management Methods Less Than Adequate (LTA); Management policy guidance / expectations not well-defined, understood or enforced A3B1C07 - Human Performance Less Than Adequate (LTA); Skill Based Errors; Omission/repeating of steps based on assumptions for completion -->couplet - A5B4C01 - Communications Less Than Adequate (LTA); Verbal Communications LTA; Communication between work groups LTA		
ISM:	4) Perform Work Within Controls		
Subcontractor Involved:	Yes Jonas & Assoc.		
Occurrence Description:	<p>On August 6, 2007 at a safety meeting two contract pipe fitters addressed their concerns about arriving at a field job and observing two open de-energized electrical disconnect panels. At 11:30 AM SNL Management was made aware of the activity in question.</p> <p>They had been contracted to replace two cooling tower filter pumps at B968. When they first arrived at the job the electrical cables to the pumps had yet to be disconnected. The pipe fitters called the Sandia Designated Representative(SDR) and a contract electrician was sent to remove the load side wiring of the disconnect panels.</p> <p>The contract electrician used lock-out tag-out on the motor control center (MCC) and de-energized the disconnect panels to the two filter pumps. Electrical supply wires to the pumps from the disconnect panels were removed. The empty conduit was left for reuse to reconnect the new pumps. The Electrician's LOTO was removed and the MCC was left in the off position. The contract electrician then called the pipe fitter via a 2-way radio</p>		

	<p>and indicated that everything was de-energized and it was safe for them to continue their part of the pump replacement.</p> <p>The pipe fitters reported finding the disconnect panels open and visually observed the wires pulled from the conduit. In order to complete the pump replacement one of the empty pieces of conduit needed to be removed. The locknut at the bottom of the open disconnect panel was rotated with the fingers of one of the pipe fitters to drop the conduit.</p> <p>Though the disconnect panels were reported open and de-energized, turning the locknut on the inside of the panel to complete the removal of the conduit is a failure to follow prescribed LOTO procedures.</p>
Cause Description:	<p>A4B1C01 - Management policy guidance Less Than Adequate (LTA) Management allowed verbal handoff between workgroups using a two-way hand held radio. This instrument in this case proved to be an unreliable communication source and a contributing cause of the misinterpretation of the communication between workgroups.</p> <p>A5B4C01 - Verbal Communications between workgroups LTA Project handoffs between internal workgroups in this case were being done verbally through a two-way radio. A strong trust had been built over time between the workgroups which caused a false sense of safety. Though this trust that had developed is a very necessary and essential part of a handoff between workgroups. Handoffs should be done in person to avoid any misinterpretation of the communication.</p> <p>A3B1C07 - Human Performance Skill Based Errors – Omission of steps based on assumptions by the Individual that activity steps were completed. Based on that perception, an error occurred because the incorrect decision or assumption was made. The pipe fitter believed disconnected panels for the pumps were still lockout and tagged out at the motor control center (MCC) and that the disconnect panel had been left open so it was easily observable that the wires to the pump had been pulled. The pipe fitter removed the conduit and completed his work confident that it was safe.</p>
Operating Conditions:	Normal
Activity Category:	Construction
Immediate Action(s):	Pipe fitters reported concern over open disconnect panels at the safety meeting which lead to the event discovery.
FM Evaluation:	EOC - 8/6/2007 - 1130 - #2903 DOE/FR - Jeff Irwin - 1145 9/21/2007 - 45 days
DOE Facility Representative Input:	
DOE Program Manager	

Input:							
Further Evaluation is Required:	No						
Division or Project:	8000						
Plant Area:	B968 Chiller pump						
System/Building/Equipment:	B968 Chiller						
Facility Function:	Balance-of-Plant - Site/outside utilities						
Corrective Action 01:	<table border="1"> <tr> <td>Target Completion Date:11/30/2007</td> <td>Actual Completion Date:10/29/2007</td> </tr> </table>	Target Completion Date: 11/30/2007	Actual Completion Date: 10/29/2007				
Target Completion Date: 11/30/2007	Actual Completion Date: 10/29/2007						
	(A4B1C01,A5B4C01)Work Order/Work Package Planning sheet will be changed to require an initial by the person representing each workgroup to signify a face to face handoff.						
Corrective Action 02:	<table border="1"> <tr> <td>Target Completion Date:10/31/2007</td> <td>Actual Completion Date:10/10/2007</td> </tr> </table>	Target Completion Date: 10/31/2007	Actual Completion Date: 10/10/2007				
Target Completion Date: 10/31/2007	Actual Completion Date: 10/10/2007						
	(A3B1C07) Communicate the expectation each authorized individual use their personal LOTO to protect them from hazardous energy.						
Lessons(s) Learned:							
HQ Keywords:	01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous) 01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical) 01P--Inadequate Conduct of Operations - Inadequate Oral Communication 01R--Inadequate Conduct of Operations - Management issues 08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance 11G--Other - Subcontractor 12I--EH Categories - Lockout/Tagout (Electrical or Mechanical) 14E--Quality Assurance - Work Process Deficiency						
HQ Summary:	A LO/TO procedure violation occurred when a pipefitter removed a conduit locknut within an electrical disconnect panel during a chiller pump replacement. An electrician previously removed his LO/TO and verbally informed the pipefitter that the equipment was de-energized and safe for the pipefitters to complete their part of the pump replacement. However, an empty piece of conduit needed to be removed, which was accomplished by rotating a locknut at the bottom of the open disconnect panel. Though the disconnect panels were reported open and de-energized, turning the locknut on the inside of the panel to complete the removal of the conduit is a failure to follow prescribed LOTO procedures.						
Similar OR Report Number:	1. ALO--KO-SNL-CAFAC-2005-0001						
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td>Jill Hruby</td> </tr> <tr> <td>Phone</td> <td>(925) 294-2596</td> </tr> <tr> <td>Title</td> <td>Director</td> </tr> </table>	Name	Jill Hruby	Phone	(925) 294-2596	Title	Director
Name	Jill Hruby						
Phone	(925) 294-2596						
Title	Director						

Originator:	Name	CRIPPEN, TERRI L		
	Phone	(925) 294-3675		
	Title	OCCURRENCE MANAGEMENT REPRESENTATIVE		
HQ OC Notification:	Date	Time	Person Notified	Organization
	NA	NA	NA	NA
Other Notifications:	Date	Time	Person Notified	Organization
	08/06/2007	11:30 (PTZ)	Blake MacDonald	8514
	08/06/2007	11:35 (PTZ)	Terri Crippen	8518
	08/06/2007	11:35 (PTZ)	Bernie Bernal	8518
	08/06/2007	11:45 (PTZ)	Jay Larsen	8517
	08/06/2007	11:45 (PTZ)	Jeff Irwin	DOE/SSO
	08/06/2007	12:30 (PTZ)	Ed Cull	8510
	08/06/2007	13:15 (PTZ)	Jill Hruby	8100
Authorized Classifier(AC):	Jeff Irwin Date: 09/20/2007			

12)Report Number:	SC--ASO-ANLE-ANLEAPS-2007-0003 After 2003 Redesign		
Secretarial Office:	Science		
Lab/Site/Org:	Argonne National Laboratory East		
Facility Name:	Advanced Photon Source		
Subject/Title:	Employee Reports Electrical Shock While Plugging Power Adaptor Into Surge Suppressor		
Date/Time Discovered:	08/07/2007 11:00 (CTZ)		
Date/Time Categorized:	08/07/2007 11:45 (CTZ)		
Report Type:	Notification/Final		
Report Dates:	Notification	08/09/2007	21:25 (ETZ)
	Initial Update	08/09/2007	21:25 (ETZ)
	Latest Update	08/09/2007	21:25 (ETZ)
	Final	08/09/2007	21:25 (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:	3) Develop and Implement Hazard Controls
Subcontractor Involved:	No
Occurrence Description:	<p>On August 7, 2007, while plugging a Dell Computer AC adaptor into a model IBAR12-20ULTRA Tripp-Lite transient voltage suppressor, an employee received what was described as a shock. The surge suppressor was mounted underneath the working surface being used by the employee so the employee had to squat to insert the 3 prong grounded power plug for the AC adaptor into the surge suppressor. The employee was using his right hand to hold the plug and was pushing his left hand against a linoleum tiled floor to steady himself while squatting. The employee stated he felt a slight shock at his left hand thumb that was resting on the floor, but did not feel any shock in his right hand. He also stated his right hand fingers/thumb were not in contact with the plug prongs at the time.</p> <p>Upon feeling the mild shock, the employee mentioned this to other employees in the work area. His supervisor was contacted, followed by a divisional ESH Coordinator, and then the Scientific User Facilities (SUF) ESH/QA Coordinator. Subsequently, a 911 call was made and the Argonne Fire Department paramedics took the employee to the site medical office for examination. The medical examination revealed no apparent signs of electrical shock damage and the employee was subsequently released with no restrictions. He was requested to report back for a follow up the next day.</p> <p>The associated wall outlet was locked out with a LOTO. The AC adaptor, surge suppressor, and a small vacuum cleaner also plugged into the surge suppressor were all removed from service for an electrical equipment inspection. Subsequent inspection found no faults with the equipment to account for the reported electrical shock.</p>
Cause Description:	
Operating Conditions:	Normal operations; indoor work; humid atmosphere; power circuit energized
Activity Category:	Normal Operations (other than Activities specifically listed in this Category)
Immediate Action(s):	<p>Employee was taken to the Argonne Medical Department for examination and was subsequently released with no work restrictions. A follow up examination the following morning was requested.</p> <p>Two APS employees who had received DOE sanctioned training as "designated electrical equipment inspectors" performed a detailed inspection of the surge suppressor, AC power adaptor, and vacuum cleaner. No faults were found to account for the reported electrical shock. The wall outlet the surge suppressor was plugged into also was examined with no faults being found. As no faults were found, the equipment was returned to service.</p> <p>The employee claimed when interviewed that he did not touch a plug prong with his right hand fingers/thumb.</p>

	The work room is in an air conditioned building, but high outdoor temperature and humidity resulted in the room air being noticeably more humid than normal. However, no moisture condensate was noted on any equipment in the room.						
FM Evaluation:	<p>It is indeterminate as to whether the reported shock was from the surge suppressor, adaptor power plug, static, or possibly a momentary pinched nerve to the individual. APS management will consider the use of surge suppressors or power strips mounted where they are not clearly visible or that require some contortion in order to insert or remove power plugs.</p> <p>All involved electrical equipment was confirmed to be safe through detailed inspection and was returned to normal use.</p>						
DOE Facility Representative Input:							
DOE Program Manager Input:							
Further Evaluation is Required:	No						
Division or Project:	APS Engineering Support Division (AES)						
Plant Area:	APS Area						
System/Building/Equipment:	Power distribution/Building 401/surge suppressor						
Facility Function:	Accelerators						
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:	While plugging an AC adaptor into a transient voltage suppressor, an employee received an electrical shock. The employee was taken to the site medical office for a medical examination which revealed no apparent signs of electrical shock damage. The employee was subsequently released with no restrictions. The associated wall outlet was locked out. The AC adaptor, surge suppressor, and a small vacuum cleaner also plugged into the surge suppressor were all removed from service for an electrical equipment inspection. No faults with the equipment were found which would account for the reported electrical shock.						
Similar OR Report Number:	1. SC--ASO-ANLE-ANLEFMS-2007-0006						
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td>BARKALOW, THOMAS W</td> </tr> <tr> <td>Phone</td> <td>(630) 252-9243</td> </tr> <tr> <td>Title</td> <td>SENIOR REGULATORY COMPLIANCE SPECIAL</td> </tr> </table>	Name	BARKALOW, THOMAS W	Phone	(630) 252-9243	Title	SENIOR REGULATORY COMPLIANCE SPECIAL
Name	BARKALOW, THOMAS W						
Phone	(630) 252-9243						
Title	SENIOR REGULATORY COMPLIANCE SPECIAL						

Originator:	Name	MEREDITH, STUART G		
	Phone	(630) 252-6312		
	Title	PAAA COORDINATOR		
HQ OC Notification:	Date	Time	Person Notified	Organization
	NA	NA	NA	NA
Other Notifications:	Date	Time	Person Notified	Organization
	08/07/2007	11:45 (CTZ)	Stuart Meredith	ANL-EQO
	08/07/2007	12:00 (CTZ)	Creig Zook	DOE-ASO
Authorized Classifier(AC):				

13)Report Number:	SC--FSO-FNAL-FERMILAB-2007-0006 After 2003 Redesign		
Secretarial Office:	Science		
Lab/Site/Org:	FERMI National Accelerator Laboratory		
Facility Name:	FERMI National Accelerator Lab.(BOP)		
Subject/Title:	Transformer Arc Flash		
Date/Time Discovered:	08/07/2007 17:30 (CTZ)		
Date/Time Categorized:	08/09/2007 10:00 (CTZ)		
Report Type:	Notification/Final		
Report Dates:	Notification	08/13/2007	17:22 (ETZ)
	Initial Update	08/13/2007	17:22 (ETZ)
	Latest Update	08/13/2007	17:22 (ETZ)
	Final	08/13/2007	17:22 (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:	2) Analyze the Hazards		
Subcontractor Involved:	No		
Occurrence Description:	On Tuesday, August 7, 2007 subcontractor employees were preparing to sandblast the exterior of Lab 4 in preparation for painting the building. The building is served by overhead power lines. The incoming electrical system		

	<p>consisted of a main feed transformer of 34.5 KV approximately 500 feet from the building Lab 4, which stepped down to a 12.4 KV, 7200V to ground, distribution system supply to numerous pole mounted transformers throughout the Village. The pole mounted transformers at Lab 4 consists of a cluster of three transformers, each transformer is 100 KW and each transformer supplies power to a different phase, A, B, and C. The wood pole at Lab 4 on which the transformers are mounted is located at the northeast side of the building, approximately 20 feet from the building. The transformers are at a height of approximately 25 feet.</p> <p>At approximately 5:30 pm, on August 7, 2007 two journeymen Fermilab electricians were assigned to shut down the incoming electrical power to Lab 4. The electricians positioned an insulated bucket truck on the east side of the building at an elevation directly in front of the cross arm that supports the porcelain insulators and the cut-out/fuse links. They used an insulated five foot (hot-stick/hookstick) extended approximately 10 feet from the torso, (7.5 feet from hands) to the cut-out. The electrician performed the work in accordance with existing FESS procedures and was wearing the personal protective equipment required by NFPA 70E. (Tools consisted of insulated bucket truck and hook stick; PPE consisted of Natural fiber long sleeved shirt and long pants; hard hat; 45 cal arc flash hood; 32 cal arc flash coat; class 2 electrical gloves with leather protectors; electrical rated leather shoes).</p> <p>The first center cut-out/fuse was pulled without incident. When the adjacent cut-out/fuse was pulled there was an arc. The arc ionized in/with the humid air, causing a phase-to-phase plasma with the next energized adjacent phase resulting in a flashover. The event also caused an over current in the main feed transformer, blowing its primary fuses and taking down power to the entire Fermilab Village. There were no injuries to either employee. There were no burn or flash-marks on the PPE as a result of this incident.</p>
Cause Description:	<p>It was determined that the primary cause of the arc flash incident was high humidity. The temperature was approximately 88 degrees and relative humidity was approximately 62% percent with a dew point of 72 degrees. Although the first center cut-out/fuse was pulled without incident, there was an arc when the adjacent cut-out/fuse was pulled. The arc ionized the humid air, causing a phase-to-phase plasma to the next energized adjacent phase resulting in a flashover. The event caused an over current in the main feed transformer, blowing its primary fuses and taking down power to the entire Fermilab Village.</p>
Operating Conditions:	<p>Operating conditions at the time of the incident were normal.</p>
Activity Category:	<p>Normal Operations (other than Activities specifically listed in this Category)</p>
Immediate Action(s):	<p>The electrical provider (Commonwealth Edison Company) to the Village area was contacted to perform necessary repairs to restore the electric to the Village and the work was completed by 3:30 am on August 8, 2007.</p>

	<p>Facilities Engineering Services Section (FESS) management visited the incident location the morning after the incident to review the preliminary information. FESS electricians removed the porcelain insulators and cut-out switches for examination to determine the extent and cause for the arc flash. No material or equipment defect was observed.</p> <p>A tool-box meeting was held Friday August 9, 2007 with the FESS Operations employees. This included the high-voltage group, the electricians, as well as the other FESS employees. The supervisor overseeing the work discussed the incident. He showed the transformer cut-out and discussed the impact of extremely high humidity on the job in question. The electrician involved modelled the PPE he had been wearing, so as to demonstrate to the other employees how important PPE is in these types of work activities.</p>			
FM Evaluation:	<p>This event highlights the importance of appropriate PPE when working with high voltage equipment. The use of the correct tools and PPE probably prevented serious injury to the personal performing the task. FESS management is reviewing their procedures in light of this incident and discussing the lessons learned with their employees.</p>			
DOE Facility Representative Input:				
DOE Program Manager Input:				
Further Evaluation is Required:	No			
Division or Project:	Facilities Engineering Services			
Plant Area:	Lab 4			
System/Building/Equipment:	Lab 4 100 KW Transformer			
Facility Function:	Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)			
Corrective Action 01:	<table border="1"> <tr> <td>Target Completion Date:10/31/2007</td> <td>Actual Completion Date:09/21/2007</td> </tr> </table>	Target Completion Date: 10/31/2007	Actual Completion Date: 09/21/2007	
Target Completion Date: 10/31/2007	Actual Completion Date: 09/21/2007			
	Electrical Safety Subcommittee to conduct analysis of events			
Corrective Action 02:	<table border="1"> <tr> <td>Target Completion Date:11/30/2007</td> <td>Actual Completion Date:11/26/2007</td> </tr> </table>	Target Completion Date: 11/30/2007	Actual Completion Date: 11/26/2007	
Target Completion Date: 11/30/2007	Actual Completion Date: 11/26/2007			
	Incorporate lessons learned into existing FESS procedure.			
Lessons(s) Learned:	<p>When planning electrical work, the weather conditions need to be considered as potential hazards. In this incident, the extremely high humidity was the primary cause of the arc flash. The Midwest area of the country has been experiencing an extended period of high temperatures and humidity. The possibility of delaying the work until more moderate weather conditions should be considered.</p>			

	This incident re-enforces the importance of using correct tools and personal protective equipment when performing electrical work. The use of the correct tools and PPE probably prevented serious injury to the person performing the task.															
HQ Keywords:	01M--Inadequate Conduct of Operations - Inadequate Job Planning (Electrical) 07B--Electrical Systems - Electrical Distribution 07C--Electrical Systems - Power Outage 11D--Other - Natural Phenomena 12C--EH Categories - Electrical Safety 14E--Quality Assurance - Work Process Deficiency															
HQ Summary:	Two journeymen Fermilab electricians positioned within an insulated bucket truck were removing high voltage cut-out fuse links with an insulated hot stick when an electrical arc occurred. The arc ionized in/with the humid air, causing a phase-to-phase plasma with the next energized adjacent phase, resulting in a flashover. The event also caused an over current in the main feed transformer, blowing its primary fuses and taking down power to the entire Fermilab Village. The employees were wearing appropriate PPE. There were no injuries to either employee. There were no burn or flash-marks on the PPE as a result of this incident.															
Similar OR Report Number:																
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td colspan="3">Bruce Chrisman</td> </tr> <tr> <td>Phone</td> <td colspan="3">(630) 840-2359</td> </tr> <tr> <td>Title</td> <td colspan="3">Chief Operating Officer</td> </tr> </table>				Name	Bruce Chrisman			Phone	(630) 840-2359			Title	Chief Operating Officer		
Name	Bruce Chrisman															
Phone	(630) 840-2359															
Title	Chief Operating Officer															
Originator:	<table border="1"> <tr> <td>Name</td> <td colspan="3">JAMES, WILLIAM R</td> </tr> <tr> <td>Phone</td> <td colspan="3">(630) 840-8901</td> </tr> <tr> <td>Title</td> <td colspan="3">ES&H EMERGENCY PLANNER</td> </tr> </table>				Name	JAMES, WILLIAM R			Phone	(630) 840-8901			Title	ES&H EMERGENCY PLANNER		
Name	JAMES, WILLIAM R															
Phone	(630) 840-8901															
Title	ES&H EMERGENCY PLANNER															
HQ OC Notification:	<table border="1"> <thead> <tr> <th>Date</th> <th>Time</th> <th>Person Notified</th> <th>Organization</th> </tr> </thead> <tbody> <tr> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> </tr> </tbody> </table>				Date	Time	Person Notified	Organization	NA	NA	NA	NA				
Date	Time	Person Notified	Organization													
NA	NA	NA	NA													
Other Notifications:	<table border="1"> <thead> <tr> <th>Date</th> <th>Time</th> <th>Person Notified</th> <th>Organization</th> </tr> </thead> <tbody> <tr> <td>08/09/2007</td> <td>11:30 (CTZ)</td> <td>Sally Arnold</td> <td>DOE-FSO</td> </tr> </tbody> </table>				Date	Time	Person Notified	Organization	08/09/2007	11:30 (CTZ)	Sally Arnold	DOE-FSO				
Date	Time	Person Notified	Organization													
08/09/2007	11:30 (CTZ)	Sally Arnold	DOE-FSO													
Authorized Classifier(AC):																

14)Report Number:	SC--PNSO-PNNL-PNNLBOPER-2007-0009 After 2003 Redesign
Secretarial Office:	Science
Lab/Site/Org:	Pacific Northwest National Laboratory
Facility Name:	Energy Research Programs (PNNL)
Subject/Title:	Damaged Direct-Buried 277V Cable Encountered During Sprinkler Repair

Date/Time Discovered:	08/26/2007 07:48 (PTZ)		
Date/Time Categorized:	08/26/2007 08:14 (PTZ)		
Report Type:	Final		
Report Dates:	Notification	08/28/2007	21:06 (ETZ)
	Initial Update	10/08/2007	12:08 (ETZ)
	Latest Update	10/08/2007	12:08 (ETZ)
	Final	10/08/2007	12:08 (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:	A4B3C11 - Management Problem; Work Organization & Planning LTA; Inadequate work package preparation A1B1C02 - Design/Engineering Problem; Design input Less Than Adequate (LTA).; Design input obsolete A4B1C03 - Management Problem; Management Methods Less Than Adequate (LTA); Management direction created insufficient awareness of the impact of actions on safety / reliability		
ISM:	5) Provide Feedback and Continuous Improvement		
Subcontractor Involved:	Yes George Grant & Associates		
Occurrence Description:	<p>At approximately 0715 hours, Sunday, August 26, 2007, a construction contractor encountered a damaged direct-buried energized line while repairing broken sprinkler risers south of the Math Building. The project was to refurbish the parking area landscape prior to repaving the nearby parking lot. There was no electrical scope in the work being performed. Work planning did include identification that electrical was in the vicinity but not expected to be encountered.</p> <p>The contractor was hand digging to gain access to an irrigation line in the shrub area of the parking lot. A 277V electrical line was known to be in this location as prior area scanning had identified and marked it. The contractor's supervisor instructed his workers to use non-conductive shovels and voltage rated gloves when they began digging within the vicinity of the marked electrical line. At that point they heard "crackling" and observed wisps of smoke coming from the ground. No conductor was visible.</p> <p>After circuits were locked out, further investigation revealed broken/worn insulation and bare conductor visible at the point where the wires exited a</p>		

	<p>steel sleeve (that ran under the driveway) and became direct-buried. The investigation also revealed that the digging was stopped within 12 inches horizontally and 4 inches vertically from the damage conductor.</p>
Cause Description:	<p>A4B3C11 - Management Problem-Work Organization & Planning LTA-Inadequate Work Package Preparation</p> <p>Work Planning was only partially effective:</p> <ul style="list-style-type: none"> - The scope of work was to remove ground cover without excavation to clear the area for ground scanning. - Scope of work did allow sprinkler repair involving hand digging (not to exceed 12" in depth) and LOTO was not required. - Known lighting circuit problems in area were not considered in planning. - Site conditions involving questionable direct-buried cable installations were not available to PNNL work planners. - New information (scan results) was not reviewed against the job planning package <p>(See corrective action #1 & #3)</p> <p>A1B1C02 - Design/Engineering Problem-Design Input LTA-Design Input Obsolete</p> <p>Electrical installation was less than adequate</p> <ul style="list-style-type: none"> - Protection for the cable exiting the steel sleeve was not provided - Proper cable bedding was not used - Buried cable markings were not used - No as-built drawing information was available <p>(See corrective action #4 & #5)</p> <p>A4B1C03 - Management Problem-Management Methods LTA-Management Direction Created Insufficient Awareness of Impact of Actions on Safety/Reliability</p> <p>Sprinkler repair is not considered excavation</p> <ul style="list-style-type: none"> - Accepted risk where depth is limited to 12" in previously disturbed soil <p>(See corrective action #2 & #6)</p> <p>Note: the methodology used to determine causal factors was DOE Guide 231.1-2, Occurrence Reporting Causal Analysis Guide.</p>
Operating Conditions:	68 F, Precipitation = 0, Humidity 37%
Activity Category:	Construction
Immediate Action(s):	<p>Work was immediately suspended and building management was notified. The damaged circuit was locked and tagged out of service. The work area was barricaded with restricted access postings and all project work was suspended. A critique was held Monday, August 27, 2007.</p>

Note: the event was initially categorized as a reportable management concern at 0814 hours; and the DOE Facility Representative was contacted at 0839 hours. Categorization was changed to 2C(2) at 1010 hours and the Facility Representative was notified at 1015 hours.

FM Evaluation:

A damaged direct-buried cable was discovered after a contractor heard "crackling" and observed wisps of smoke coming from the ground while repairing shallow (~ 12 inch deep) broken sprinkler risers in the vicinity. The shallow sprinkler repair was not considered excavation, and furthermore all this work was preparatory work to support future scanning for future excavation.

It is not known how long the cable had been damaged; however, due to the location of the damage, it is believed it was caused by the cable exiting an unbushed sleeve. At the time this cable was installed (1960's), that may have been acceptable; however, today acceptable practice would include a bushing at the point where the cable exits the sleeve, to protect the cable from this very occurrence. Inspection of the end of the steel sleeve also revealed a rough cut on the end of the sleeve, which may have contributed to the cable damage.

This 277V electrical line was known to be in this location, as prior area scanning had identified and marked it; however, the line was believed to be fully contained within conduit. The contractor was hand digging, to shallow depths, using non-conductive shovels, and voltage-rated gloves to gain access to an irrigation line in the shrubs area of the parking lot when they heard the "crackling" and observed the wisps of smoke coming from the ground. Had the line been de-energized, the damage would not have been detected at this time, as the hand digging did not go to the depth of the damaged cable.

Further visual inspection revealed broken/worn insulation and bare conductor visible at the point where the wires exited a steel sleeve (that ran under the driveway) and became direct-buried. The investigation also revealed that the digging was stopped within 12 inches horizontally and 4 inches vertically from the damage conductor. Further investigation also revealed that the parking lot lights fed by this circuit had previously operated erratically and this information was not incorporated into the work planning.

All these issues led to flawed defenses and behaviors that can be tied together as error precursors to Human Performance (in the work planning) that may have contributed to the event's initiating action. The unreliable operational state of the cable, and the knowledge that it was not fully enclosed in conduit, were not known to the project team (PNNL and contractor). That impacted the decisions not to lockout the circuit, not to treat the shallow hand digging as excavation, and ultimately the decision to treat this work as low hazard led to this event.

	Review of Similar Occurrences (see Item 37): None
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	No
Division or Project:	Facilities & Operations Directorate
Plant Area:	RCHN
System/Building/Equipment:	RRC Grounds
Facility Function:	Balance-of-Plant - Site/outside utilities
Corrective Action 01:	Target Completion Date: 10/30/2007 Tracking ID: ATS # 20243.13.1
	Brief all construction mangers and current contractors on this event and the planning considerations that contributed to it.
Corrective Action 02:	Target Completion Date: 10/30/2007 Tracking ID: ATS # 20243.13.2
	Issue timely order pending procedure changes for construction managers to require contractors to obtain an electrical-safety site-evaluation prior to any hand digging at any depth in the proximity of electrical components.
Corrective Action 03:	Target Completion Date: 10/30/2007 Tracking ID: ATS # 20243.13.3
	Review all sprinkler repair requirements, which do not involve excavation processes, to determine if additional controls are required.
Corrective Action 04:	Target Completion Date: 11/30/2007 Tracking ID: ATS # 20243.13.4
	Review and if necessary update PNNL's current electrical code compliance database to add ROB/Math Parking lot as deficient due to improper sleeve and bushing installation. This is to make sure electrical installations of this type are included for prioritization and corrective action.
Corrective Action 05:	Target Completion Date: 12/30/2007 Tracking ID: ATS # 20243.13.5
	Develop a schedule for the design and implementation of a facility and site conditions data base that can be tied to and accessed through the new Map Information Tool. The data base will used to capture hidden hazards and conditions and can be easily accessed and updated by staff members in the field. This will strengthen and improve the processes that capture known facility and site conditions so that this information is readily available to planners (this exists for facilities, but can be expanded to include external areas).
Corrective Action 06:	Target Completion Date: 11/30/2007 Tracking ID: ATS # 20243.13.6

	Develop and issue lessons learned that emphasizes the value of utilizing known site conditions and new information in job planning. In addition, highlight the contractor actions that prevented a more serious condition.															
Lessons(s) Learned:	Even when utilities are known to exist and known to be at a specific depth, additional work controls should be considered to protect workers from unexpected conditions. Additional work controls should be considered when hand digging or potholing near underground utilities. Hand digging and potholing are generally considered to be low-risk activities because work is done without mechanical equipment and workers have greater control over the depth and conditions encountered. The condition of conduits and insulation on conductors cannot be determined through ground scanning, and as such, additional precautions should be taken, such as locking-out circuits that control nearby equipment, lights, and/or devices.															
HQ Keywords:	01N--Inadequate Conduct of Operations - Inadequate Job Planning (Other) 07D--Electrical Systems - Electrical Wiring 08F--OSHA Reportable/Industrial Hygiene - Industrial Operations Issues 08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance 11F--Other - Inadequate Design 11G--Other - Subcontractor 12C--EH Categories - Electrical Safety 14E--Quality Assurance - Work Process Deficiency 14F--Quality Assurance - Design Deficiency															
HQ Summary:	A construction contractor struck a damaged direct-buried 277V energized line while hand digging to gain access to a broken irrigation line south of the PNNL Math Building. The line had been identified and marked in prior scanning, and the contractor was hand digging with a non-conductive shovel and voltage rated gloves. Investigation revealed broken/worn insulation and bare conductor visible on the line. Notifications were made, work was suspended, the area was barricaded, and the damaged circuit was locked and tagged out of service.															
Similar OR Report Number:	1. None															
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td colspan="3">Sadesky, R.</td> </tr> <tr> <td>Phone</td> <td colspan="3">(509) 376-1583</td> </tr> <tr> <td>Title</td> <td colspan="3">Manager, Capital Projects</td> </tr> </table>				Name	Sadesky, R.			Phone	(509) 376-1583			Title	Manager, Capital Projects		
Name	Sadesky, R.															
Phone	(509) 376-1583															
Title	Manager, Capital Projects															
Originator:	<table border="1"> <tr> <td>Name</td> <td colspan="3">POLLARI, ROGER A</td> </tr> <tr> <td>Phone</td> <td colspan="3">(509) 376-2200</td> </tr> <tr> <td>Title</td> <td colspan="3"></td> </tr> </table>				Name	POLLARI, ROGER A			Phone	(509) 376-2200			Title			
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HQ OC Notification:	<table border="1"> <thead> <tr> <th>Date</th> <th>Time</th> <th>Person Notified</th> <th>Organization</th> </tr> </thead> <tbody> <tr> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> </tr> </tbody> </table>				Date	Time	Person Notified	Organization	NA	NA	NA	NA				
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Date	Time	Person Notified	Organization													

	08/26/2007	08:39 (PTZ)	Carlson, J. L.	PNSO
Authorized Classifier(AC):	Pollari, R. A. Date: 10/08/2007			

15)Report Number:	SC--SSO-SU-SLAC-2007-0009 After 2003 Redesign		
Secretarial Office:	Science		
Lab/Site/Org:	Stanford Linear Accelerator Center		
Facility Name:	Stanford Linear Accelerator Center		
Subject/Title:	Employee Receives Mild Sensation at Stanford Synchrotron Radiation Laboratory (SSRL)		
Date/Time Discovered:	08/17/2007 13:00 (PTZ)		
Date/Time Categorized:	08/22/2007 15:00 (PTZ)		
Report Type:	Notification/Final		
Report Dates:	Notification	08/22/2007	19:56 (ETZ)
	Initial Update	08/22/2007	19:56 (ETZ)
	Latest Update	08/22/2007	19:56 (ETZ)
	Final	08/22/2007	19:56 (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:	3) Develop and Implement Hazard Controls		
Subcontractor Involved:	No		
Occurrence Description:	<p>Early morning (approximately 1AM) on August 17th, an SSRL employee was working in B130 rm 201. The employee noticed some water on the floor and began to look for the source. The employee opened the cabinet below the sink and a Millipore system (located on a bench by the sink). With the doors open the employee placed his hands on the outside of the cabinet making contact with the cabinet hinge and felt a slight tingling sensation in his left palm. The employee then noticed that the power cord for the Millipore system was plugged into a power strip lying in the water on the floor. He placed a box under the power strip to prevent it from making contact with the water, and left the lab. Upon returning to the lab later that morning (approximately 9 AM) the employee reported the incident to the person responsible for the lab and to his supervisor. The lab owner shut down the leaking Millipore system and cleaned up the area. On 8/20/07 the</p>		

	incident was brought to the attention of the Photon Science Safety Manager. The incident investigation began on 8/21/07 and the employee was asked to go to medical for evaluation.						
Cause Description:							
Operating Conditions:	Does not apply						
Activity Category:	Normal Operations (other than Activities specifically listed in this Category)						
Immediate Action(s):	Power strip removed, cords tie-wrapped to bench, and a temporary GFCI was placed between the Millipore system and the outlet.						
FM Evaluation:							
DOE Facility Representative Input:							
DOE Program Manager Input:							
Further Evaluation is Required:	No						
Division or Project:	Stanford Synchrotron Radiation Laboratory (SSRL)						
Plant Area:	SSRL						
System/Building/Equipment:	SSRL, Building 130 - Room 201						
Facility Function:	Accelerators						
Corrective Action:							
Lessons(s) Learned:							
HQ Keywords:	01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous) 01P--Inadequate Conduct of Operations - Inadequate Oral Communication 01Q--Inadequate Conduct of Operations - Personnel error 05D--Mechanical/Structural - Mechanical Equipment Failure/Damage 08A--OSHA Reportable/Industrial Hygiene - Electrical Shock 08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance 12C--EH Categories - Electrical Safety 14E--Quality Assurance - Work Process Deficiency						
HQ Summary:	An SSRL employee felt a slight tingling sensation in his left palm when he noticed some water on the floor, opened a cabinet below a sink, and his hand made contact with the cabinet hinge. The employee then noticed that a power cord was plugged into a power strip lying in the water on the floor. He placed a box under the power strip to prevent it from making contact with the water. The lab owner stopped the leak and cleaned up the area. The employee was asked to go to medical for evaluation.						
Similar OR Report Number:							
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td>REEK, ROBERT</td> </tr> <tr> <td>Phone</td> <td>(650) 926-4509</td> </tr> <tr> <td>Title</td> <td>FACILITY MANAGER DESIGNEE</td> </tr> </table>	Name	REEK, ROBERT	Phone	(650) 926-4509	Title	FACILITY MANAGER DESIGNEE
Name	REEK, ROBERT						
Phone	(650) 926-4509						
Title	FACILITY MANAGER DESIGNEE						

Originator:	Name	JOHNSON, HOPE E		
	Phone	(650) 926-4322		
	Title	FACILITY MANAGER ADMIN.		
HQ OC Notification:	Date	Time	Person Notified	Organization
	NA	NA	NA	NA
Other Notifications:	Date	Time	Person Notified	Organization
	08/21/2007	09:00 (PTZ)	Robert Reek	SLAC
	08/21/2007	12:07 (PTZ)	Donald Wilhelm	DOE SSO
Authorized Classifier(AC):				

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