November 2007 Electrical Safety Occurrences

There were 5 electrical safety occurrences for November 2007:

- 1 resulted in a shock to a worker
- 1 involved excavation
- 1 involved drilling into an electrical conduit
- 1 involved electrical workers and 4 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":

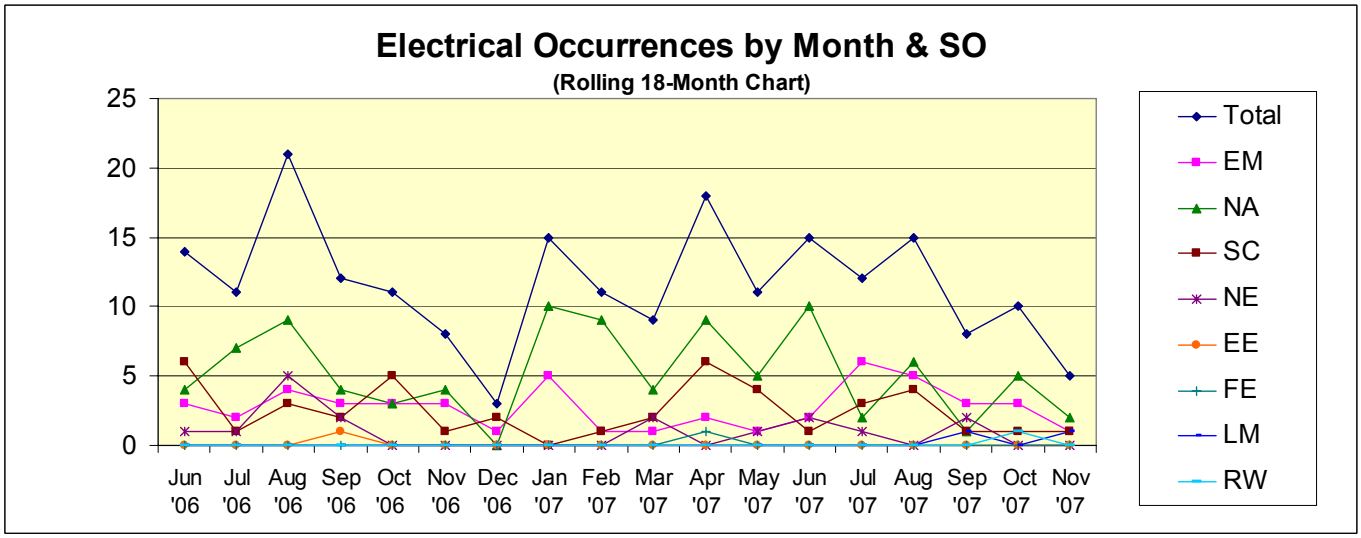
01K – Lockout/Tagout Electrical, 01M - Inadequate Job Planning (Electrical),
08A – Electrical Shock, 08J – Near Miss (Electrical), 12C – Electrical Safety

The initial search yielded 7 occurrences. However, one occurrence (EM-CAFO--WTS-WIPP-2007-0013) involved a lockout to prevent movement of a crane rather than an electrical hazard, and another (NE-ID--BEA-ATR-2007-0025) involved a loss of facility power from a lack of planning rather than an electrical hazard. Culling out these two occurrences yielded 5 electrical safety occurrences for the month.

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
Sep-07	8	0	0	0
Oct-07	10	2	0	0
Nov-07	5	1	0	0
2007 total	129 (avg. 11.7/month)	25	2	0
2006 total	166 (avg. 13.8/month)	26	3	0
2005 total	165 (avg. 13.8/month)	39	5	0
2004 total	149 (avg. 12.4/month)	25	3	1

The average rate of electrical safety occurrences in 2007 is now 11.7 per month, which remains less than the average rate of 13.8 per month experienced in 2006.



Electrical Safety Occurrences – November 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-ORO--BJC-X10WSTEMRA-2007-0004	Electrical Hazard Found in Abandoned Trailer		X								
2	LM---STOL-MOUND-2007-0001	Unexpected Discovery of an Uncontrolled Hazardous Energy Source at OU-1 Project		X	X	X						
3	NA--LASO-LANL-TA55-2007-0039	Management Concern: Configuration Management of Switchgear Upgrade Project	X		X							
4	NA--LSO-LLNL-LLNL-2007-0052	Unexpected Discovery of a 480-Volt Energy Source During Backhoe Operation Near West Gate Drive		X						X		
5	SC--PNSO-PNNL-PNNLBOPER-2007-0012	Worker Drills Into an Electrical Conduit (120V)		X							X	
	TOTAL		1	4	2	1				1	1	

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 53633 OR(s) with 56951 occurrences(s) as of 3/6/2008 7:53:14 AM
Query selected 5 OR(s) with 5 occurrences(s) as of 3/6/2008 10:25:28 AM

Download this report in Microsoft Word format.

1)Report Number:	EM-ORO--BJC-X10WSTEMRA-2007-0004 **After 2003 Redesign**
Secretarial Office:	Environmental Management
Lab/Site/Org:	Oak Ridge National Laboratory
Facility Name:	Bethel Valley/BOPCP
Subject/Title:	Electrical Hazard Found in Abandoned Trailer
Date/Time Discovered:	11/29/2007 13:00 (ETZ)
Date/Time Categorized:	11/29/2007 13:30 (ETZ)
Report Type:	Final
Report Dates:	Notification 12/03/2007 14:17 (ETZ) Initial Update 01/15/2008 15:21 (ETZ) Latest Update 01/15/2008 15:21 (ETZ) Final 01/15/2008 15:21 (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:	A3B1C07 - Human Performance Less Than Adequate (LTA); Skill Based Errors; Omission/repeating of steps based on assumptions for completion -->couplet - A4B4C05 - Management Problem; Supervisory Methods LTA; Emphasis on schedule exceeded emphasis on methods/doing a good job
ISM:	2) Analyze the Hazards
Subcontractor Involved:	Yes SEC
Occurrence Description:	Two Radiation Control Technicians (RCTs) entered abandoned Trailer 3627 on 11/27/07 at approximately 12 noon to perform a survey for release to the land fill. A portion of the roof of the trailer had been partially lifted off previously, and an electrical wire was hanging from the ceiling and resting on the table. The floor was damp. Ceiling tiles and roofing material had fallen inside the trailer on the southeast side. One RCT assumed there was no power to the trailer. That RCT moved to the northwest corner of the

	trailer where he saw a light switch and a breaker box. He flipped the light switch to the on position and the lights came on. He flipped the lights off, de-energized power in the trailer by flipping the breaker switch, exited the trailer, and notified his supervisor. The trailer was in this deteriorated state prior to being turned over to the current Facility Manager. Under normal circumstances power would have been de-energized to the trailer following the wind event that lifted the trailer roof. All individuals involved, assumed that was the case, although no one actually verified the status of electrical power prior to sending the RCTs to perform the task. The end of the wire that was hanging from the ceiling was found to be wrapped in electrical tape in a manner consistent with that of a trained electrician. Since the end of the wire was hidden in insulation, the RCT was not aware of this. However, the wire was not secured out of the way nor terminated by a more permanent means.
Cause Description:	The Facility Manager failed to confirm that electrical power to the building had been secured prior to releasing it for work. Due to the poor condition of the building, he assumed there was no power to the building.
Operating Conditions:	Shutdown and undergoing surveillance and maintenance (S&M)
Activity Category:	Inspection/Monitoring
Immediate Action(s):	All breakers for trailer 3627 were opened to de-energize power to the trailer.
FM Evaluation:	The electrical wire hanging from the ceiling was fully insulated with wire casing intact and the ends wrapped with electrical tape. The site power operations group has de-energized power to the facility. A critique was performed on 11/29/07.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	No
Division or Project:	Balance of Program Completion
Plant Area:	Central
System/Building/Equipment:	Bldg. 3627
Facility Function:	Environmental Restoration Operations
Corrective Action 01:	**Target Completion Date:**11/29/2007 **Tracking ID:**I0066848
	De-energize and air gap electrical power to the 3627 Trailer.
Corrective Action 02:	**Target Completion Date:**12/12/2007 **Tracking ID:**I0066848
	Remind Surveillance & Maintenance (S&M) Facility Managers of their

	responsibilities regarding the protection of workers prior to releasing facilities for work.
Corrective Action 03:	**Target Completion Date:**02/29/2008 **Tracking ID:**I0066848
	Remind all S&M Workers of their responsibility to back away from work that does not present as expected and inform their supervisor.
Corrective Action 04:	**Target Completion Date:**02/29/2008 **Tracking ID:**I0066848
	Remind and re-enforce to all S&M employees including, subcontractors, that communications for project problems must follow the project chain of command before functional chain of command.
Corrective Action 05:	**Target Completion Date:**04/30/2008 **Tracking ID:**I0066848
	Identify trailers and sea-land containers that have been abandoned or are not currently occupied and for which there is no eminent plans for occupancy or other use requiring electricity. For each facility perform one of the following: 1) De-energize and Air-gap 2) De-energize 3) Justify leaving the facility energized.
Corrective Action 06:	**Target Completion Date:**02/29/2008 **Tracking ID:**I0066848
	Issue a Lessons Learned that discusses the events and causes for EM-ORO-BJC-X10WSTEMRA-2007-0004.
Lessons(s) Learned:	1) Leaders need to ensure the facility is safe for work or that workers are provided proper Personnel Protection Equipment (PPE) to remain safe before asking them to work in facilities. 2) Workers need to understand that if conditions are not as expected when they arrived at a job, they should back away and call their supervisor. They should not be expected to move forward and work in an unreasonable situation. 3) Communication through the project chain of command is key to obtaining proper resolution and ensuring all reporting requirements are met.
HQ Keywords:	01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous) 01M--Inadequate Conduct of Operations - Inadequate Job Planning (Electrical) 01P--Inadequate Conduct of Operations - Inadequate Oral Communication 01R--Inadequate Conduct of Operations - Management issues 07D--Electrical Systems - Electrical Wiring 08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance 11G--Other - Subcontractor 12C--EH Categories - Electrical Safety 14E--Quality Assurance - Work Process Deficiency

HQ Summary:	Two Radiation Control Technicians were performing a survey of abandoned Trailer 3627 for release to the land fill. The roof of the trailer had been partially lifted off previously, and an electrical wire was hanging from the ceiling and resting on a table. The technicians discovered that the trailer had not been de-energized when one flipped a light switch and the lights came on. He flipped the lights off, de-energized power in the trailer by flipping the breaker switch, exited the trailer, and notified his supervisor. All breakers to the trailer were opened to fully de-energize it.
Similar OR Report Number:	1. NA--NVSO-NST-NLV-2007-0003
Facility Manager:	Name: Steve Smith Phone: (865) 241-6226 Title: Manager of Projects
Originator:	Name: SMITH, MILDRED L Phone: (865) 241-1703 Title: QUALITY ENGINEER
HQ OC Notification:	Date: NA, Time: NA, Person Notified: NA, Organization: NA
Other Notifications:	11/29/2007 13:00 (ETZ) Sylvia Wright-Reeder BJC-PM 11/29/2007 13:00 (ETZ) Carl Pilj DOE-FR 11/29/2007 13:00 (ETZ) Steve Smith BJC-MOP
Authorized Classifier(AC):	Dennis Smith Date: 01/14/2008

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2)Report Number:	LM---STOL-MOUND-2007-0001 **After 2003 Redesign**
Secretarial Office:	Legacy Management
Lab/Site/Org:	Legacy Management Site
Facility Name:	Mound Site
Subject/Title:	Unexpected Discovery of an Uncontrolled Hazardous Energy Source at OU-1 Project
Date/Time Discovered:	11/06/2007 08:00 (ETZ)
Date/Time Categorized:	11/06/2007 09:00 (ETZ)
Report Type:	Notification
Report Dates:	Notification: 11/07/2007 16:59 (ETZ) Initial Update Latest Update Final

Significance Category:	3
Reporting Criteria:	2C(2) - Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or a site condition that results in the unexpected discovery of an uncontrolled hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas). This criterion does not include discoveries made by zero-energy checks and other precautionary investigations made before work is authorized to begin.
Cause Codes:	
ISM:	
Subcontractor Involved:	Yes Accelerated Remediation Corporation (EM contractor)
Occurrence Description:	At approximately 0800 on November 6 a DOE-EM contractor employee experienced a "tingle" from a wire as level sensors were being removed from a well location at OU-1, Mound Project. The pump had been turned off, and a LOTO applied by DOE-LM contractor personnel, since the wells and pumps are the responsibility of DOE-LM. The lines to the pump had been verified as having zero energy. A further check of the system revealed that the sensors on the pump inside the well were not part of the same wiring circuit used for the pump----thus the sensors remained live (120 volt line). That wire was located, traced and de-energized. The system was checked once again, and was verified to be de-energized. However, work was stopped until the incident could be reported to management and evaluated.
Cause Description:	
Operating Conditions:	Does not apply
Activity Category:	Normal Operations (other than Activities specifically listed in this Category)
Immediate Action(s):	Worked was stopped and the power source identified and turned off. A debrief was conducted with LM and EM contractor personnel to obtain as many facts as possible about the incident. It was determined that work would not restart until the entire electrical system to these pumps is checked and verified. This will be accomplished with participation from both LM and EM contractors and involve a certified electrician. This activity is being conducted right now. An agreement was reached in the debrief that any future de-energizing of systems or equipment in the OU-1 Project area involving both LM and EM contractors will be accomplished using this joint process.
FM Evaluation:	
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is	Yes.

Required:	Before Further Operation? No By Whom: LM contractor By When:
Division or Project:	Mound Site, Miamisburg, Ohio
Plant Area:	OU-1 Project
System/Building/Equipment:	OU-1 Pump and Treat System, Well #449
Facility Function:	Balance-of-Plant - Site/outside utilities
Corrective Action:	
Lessons(s) Learned:	
HQ Keywords:	01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control 01M--Inadequate Conduct of Operations - Inadequate Job Planning (Electrical) 08A--OSHA Reportable/Industrial Hygiene - Electrical Shock 11G--Other - Subcontractor 12C--EH Categories - Electrical Safety 14D--Quality Assurance - Documents and Records Deficiency 14E--Quality Assurance - Work Process Deficiency
HQ Summary:	A DOE-EM contractor employee experienced a "tingle" from a wire while removing level sensors from a well. The well pump had been turned off, and a lockout/tagout applied and the lines to the pump had been verified as having zero energy. A further check of the system revealed that the sensors on the pump inside the well were not part of the same wiring circuit used for the pump, thus the sensors remained energized at 120 volts. That wire was located, traced and de-energized. Work was stopped until the incident could be reported to management and evaluated.
Similar OR Report Number:	1. None
Facility Manager:	Name: WEIDENBACH, GARY L Phone: (937) 847-8350 Title: FACILITY MANAGER
Originator:	Name: WEIDENBACH, GARY L Phone: (937) 847-8350 Title: FACILITY MANAGER

HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:

Date	Time	Person Notified	Organization
11/06/2007	09:30 (ETZ)	Art Kleinrath	DOE-LM
11/06/2007	09:30 (ETZ)	Don Pfister	DOE-EM

Authorized Classifier(AC):	

3)Report Number:	NA--LASO-LANL-TA55-2007-0039 **After 2003 Redesign**
Secretarial Office:	National Nuclear Security Administration
Lab/Site/Org:	Los Alamos National Laboratory
Facility Name:	Plutonium Proc & Handling Fac
Subject/Title:	Management Concern: Configuration Management of Switchgear Upgrade Project
Date/Time Discovered:	11/13/2007 20:00 (MTZ)
Date/Time Categorized:	11/14/2007 14:45 (MTZ)
Report Type:	Notification/Final
Report Dates:	Notification 11/16/2007 15:13 (ETZ) Initial Update 11/16/2007 15:13 (ETZ) Latest Update 11/16/2007 15:13 (ETZ) Final 11/16/2007 15:13 (ETZ) Revision 1 11/28/2007 18:22 (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:	4) Perform Work Within Controls
Subcontractor Involved:	Yes B&D Electric and KSL
Occurrence Description:	MANAGEMENT SYNOPSIS: At Technical Area 55 (TA-55), an ongoing project has been focused on upgrading the two main power feeds to the main facility. One power feed, EA-9, was nearly completed in its upgrade. However, some final parts were needed and their arrival date had been delayed by the supplier. In trying to utilize time appropriately, project personnel made a decision to temporarily switch power for the main facility to EA-9 and perform upgrades to the S-10 power feed, while waiting for the parts. When preparing to make this switch on the evening of November 13, 2007, the under voltage relay signal for EA-9 was not received at the TA-55 Operations Center, indicating that something was not connected correctly. Project personnel decided to call a pause to the work at approximately 2000 that evening. Project personnel regrouped the next morning to discuss options. The LANL Project Manager informed the Facilities Operations

Director (FOD) of the situation, who called a critique the afternoon of November 14, 2007. At the critique it became clear that on-site project personnel on November 13, 2007 did not use the correct configuration management tools to document their deviation from the accepted Design Change Plan for the upgrade project. In light of this information, the FOD declared this a Management Concern, Significance Category 4.

BACKGROUND: The Switchgear Upgrade Project has been focused on installation and upgrades of TA-55's secondary power feed, EA-9. Currently, the main facility, PF-4, is running off of a single power feed, S-10. PF-4 is a Hazardous Category 2 facility, and therefore, any work affecting the facility must go through rigorous documentation in accordance with configuration management. The upgrades and installations for EA-9 had been approved in an appropriate DCP. The plan included that once EA-9 was upgraded, power would be switched to it while similar upgrades were performed on S-10.

The improvements of EA-9 included upgrading from a single phase under voltage relay to a three phase under voltage relay. However, some critical materials to complete this part of the upgrade had not arrived. Project personnel decided to make as much use of their time as possible. It was decided that power would be transferred to EA-9 temporarily, using the single phase under voltage relay, while upgrades were performed on S-10. Then power would be switched back to EA-9 once the essential materials were received. This proposed temporary power shift to EA-9 deviated from the accepted DCP.

This proposed deviation from the accepted DCP was not documented, as required by configuration management and Conduct of Operations. Proper documentation would have included a Facility Change Request (FCR), which would have to undergo an Unreviewed Safety Question (USQ) screening. The KSL Project Manager, when tasked with this proposed temporary switch of power, should have used the Request For Information (RFI) process. Also, KSL should have used the Engineering Change Request (ECR) process, which would be needed for the FCR. Due to the lack of proper documentation, the LANL Project Manager was not aware of this proposed deviation from the DCP, indicating a break down in communication between the personnel in the field and the LANL Project Manager.

On November 13, 2007, KSL was tasked with assisting in transferring power from EA-9 to S-10. Utilities Line Crew personnel performed the actual power transfer, being the properly trained personnel. The new Potential Transformer (PT) cabinets in building PF-6 were checked and found to be in the correct configuration to perform energizing. The EA-9 grounds were removed and the fuses closed. At this point, the TA-55 Operations Center should have been able to see power feed from both S-10

	and EA-9. Project personnel called the Operations center to confirm this and discovered that the Operations Center could not see power from EA-9. Some basic power tracings were performed at this point. The PT cabinets were operating correctly. The programmable logic controller (PLC) cabinets had the correct voltage. It was discovered that the under voltage system was not working. The drawings were not readily available to project personnel to perform further checks. However, it was obvious to personnel that something was not connected properly. Project personnel at this time, 2000, decided to pause work until the following day. EA-9 and associated work was left in a safe configuration. TA-55 was still on S-10 power feed. There was no power interruption to any of the PF-4 and PF-6 systems. Having discussed all this in detail at the critique held on November 14, 2007, the FOD had concerns that communication to the LANL Project Manager from the KSL Project Manager and the LANL Design Authority was not as complete as it could have been. The LANL Project Manager is the designated authority for moving ahead on any deviation from the DCP. The FOD also had concerns that personnel in the field were so focused on working efficiently, that this was not seen as a deviation from the DCP, but seen as unfinished work. At the critique, further details about the delayed materials came to light. The sub-contractor B&D Electric ordered the parts from General Electric. General Electric had to order the parts from a supplier out of country. However, the parts were missed in the listing by General Electric, causing a delay in ordering the materials. This was known by project personnel the middle of October 2007. On November 13, 2007, project personnel had received a target delivery date of November 15, 2007 for the needed materials. However, project personnel felt that moving ahead with the proposed temporary power switch would be time efficient for the project as a whole.
Cause Description:	
Operating Conditions:	Normal
Activity Category:	Maintenance
Immediate Action(s):	1) Work was left in a safe configuration, with S-10 as the power feed on November 13, 2007. 2) Critique was held on November 14, 2007 to discuss communication and documentation issues in detail. 3) Project personnel instigated on November 14, 2007 a daily teleconference between LANL Project Manager, KSL Project Manager, and Design Authority personnel, specifically covering planned outages and material/parts status. 4) The LANL Project Manager will work with the Issues Management Coordinator (IMC) to issue a Lessons Learned.

	5) The Design Authority and KSL Project Manager will work with the LANL Project Manager to review and document where the Switchgear Upgrade Project currently stands. This will include reviewing the work package, specifically the Integrated Work Document (IWD), for B&D Electric.
FM Evaluation:	
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	No
Division or Project:	TA-55
Plant Area:	TA-55
System/Building/Equipment:	Switchgear Upgrade Project
Facility Function:	Plutonium Processing and Handling
Corrective Action:	
Lessons(s) Learned:	
HQ Keywords:	01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous) 01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control 01E--Inadequate Conduct of Operations - Operations Procedure Noncompliance 01M--Inadequate Conduct of Operations - Inadequate Job Planning (Electrical) 01P--Inadequate Conduct of Operations - Inadequate Oral Communication 07B--Electrical Systems - Electrical Distribution 11G--Other - Subcontractor 12B--EH Categories - Conduct of Operations 14D--Quality Assurance - Documents and Records Deficiency 14E--Quality Assurance - Work Process Deficiency
HQ Summary:	During an upgrade of two main power feeds to the main facility, project personnel temporarily switched power for the main facility to one feed which had been successfully upgraded, while waiting for parts for the second feed. When preparing to make this switch, the expected under voltage relay signal for EA-9 was not received at the TA-55 Operations Center, indicating that something was not connected correctly. Work was paused and a critique was held. During the critique, it was determined that on-site project personnel did not use the correct configuration management tools to document their deviation from the accepted Design Change Plan for the upgrade project.
Similar OR Report Number:	

Facility Manager:	Name: Stuart McKernan Phone: (505) 667-7501 Title: Facilities Ooperations Director Designee
Originator:	Name: CORDOVA, LUANNA M Phone: (505) 667-0598 Title: DATA ANALYST
HQ OC Notification:	Date: NA, Time: NA, Person Notified: NA, Organization: NA
Other Notifications:	11/14/2007 08:39 (MTZ) Lily Reese PAAA 11/14/2007 10:54 (MTZ) Hot Line NNSA 11/14/2007 10:56 (MTZ) Lloyd Gordon LANL ESO 11/14/2007 10:59 (MTZ) Chuck Keilers DNSFB
Authorized Classifier(AC):	Susan J. Voss Date: 11/16/2007

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4)Report Number:	NA--LSO-LLNL-LLNL-2007-0052 **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:	Unexpected Discovery of a 480-Volt Energy Source During Backhoe Operation Near West Gate Drive
Date/Time Discovered:	11/05/2007 09:30 (PTZ)
Date/Time Categorized:	11/05/2007 10:30 (PTZ)
Report Type:	Update
Report Dates:	Notification 11/06/2007 16:22 (ETZ) Initial Update 12/19/2007 19:52 (ETZ) Latest Update 02/01/2008 17:07 (ETZ) Final
Significance Category:	3
Reporting Criteria:	2C(2) - Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or a site condition that results in the unexpected discovery of an uncontrolled hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas). This criterion does not include discoveries made by zero-energy checks and other precautionary investigations made before work is authorized to begin.

Cause Codes:	
ISM:	
Subcontractor Involved:	No
Occurrence Description:	On Saturday, November 3, 2007, at 1430 an LLNL worker operating a backhoe struck a conduit containing live 480 volt electrical wiring that controlled that motor for the perimeter fence on West Gate Drive. There was no injuries, flash, spark, or any other indication of a live electrical wiring strike. Background: The backhoe operator was excavating soil for the installation of a storm drain and catch basin system in a landscaping area near West Gate Drive. The area was previously located for buried utilities by LLNL utility locators, but this particular conduit was not identified, nor marked. At the time of the incident, the disrupted conduit (PVC pipe approximately 7 feet below grade) was thought to be landscape irrigation control wiring. On Monday, November 5, 2007 at approximately 0530, Security Department personnel attempted to open the LLNL West Gate and found it to be inoperable. LLNL electricians responded to assist with the gate and found the broken conduit to be the reason for why the gate was unable to function. A review was has been initiated in response to this event WSH Citation Selection: 1926.651 851.20(a)(8)
Cause Description:	
Operating Conditions:	na
Activity Category:	Construction
Immediate Action(s):	1) On 11-5-07 work on the West Gate pathway project was immediately stopped. 2) The damaged conduit was locked out and tagged out. 3) The damaged was repaired by LLNL electricians on 11/05/07. 4) LLNL locators were requested to re-scan the West gate pathway job site. 5) LLNL line management initiated a critique/review to be performed on the event.
FM Evaluation:	This report has been extended. The justification for the extension is as follows: Additional time is needed to distribute the final draft critique to F&I line management for review and comment so that corrective actions can be developed. Please extend the due date 45 days. Update 2/1/2008: This report has been extended. The justification for the extension is as follows: Additional time is needed for F&I line management to review, comment, and ensure that effective corrective actions are developed.

	The final report is due on 3/17/2008.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	Yes. Before Further Operation? No By Whom: Kevin Akey By When: 02/01/2008
Division or Project:	O&B / F&I
Plant Area:	Site 200
System/Building/Equipment:	Outside West Gate Drive Area
Facility Function:	Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)
Corrective Action:	
Lessons(s) Learned:	
HQ Keywords:	01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control 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 14D--Quality Assurance - Documents and Records Deficiency 14E--Quality Assurance - Work Process Deficiency
HQ Summary:	While installing a storm drain and catch basin system a backhoe struck a PVC conduit containing energized 480-volt electrical wiring that controlled the motor for the perimeter fence on West Gate Drive. There were no injuries or indication of an energized electrical wiring strike. The area had been surveyed for buried utilities, but this particular conduit was not identified, nor marked. At the time of the incident, the conduit was thought to be landscape irrigation control wiring. Work on the West Gate pathway project was immediately stopped; the damaged conduit was locked out and tagged out, and the wiring repaired.
Similar OR Report Number:	
Facility Manager:	Name: Harold Conner Phone: (925) 422-5786 Title: Facilities & Infrastructure Associate Director
Originator:	Name: Freeman, Jeffrey W Phone: (925) 424-6787 Title: OCCURRENCE REPORTING

HQ OC Notification:	

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:	

Date	Time	Person Notified	Organization
11/05/2007	10:45 (PTZ)	Ellen Raber	LEDO
11/05/2007	10:50 (PTZ)	Allen Macenski	ESH&Q
11/05/2007	10:53 (PTZ)	Steve McConnell fo TL	ES&H TL
11/05/2007	11:00 (PTZ)	Roy Kearns	NNSA/LSO

Authorized Classifier(AC):	

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5)Report Number:	SC--PNSO-PNNL-PNNLBOPER-2007-0012 **After 2003 Redesign**
Secretarial Office:	Science
Lab/Site/Org:	Pacific Northwest National Laboratory
Facility Name:	Energy Research Programs (PNNL)
Subject/Title:	Worker Drills Into an Electrical Conduit (120 V)
Date/Time Discovered:	11/08/2007 15:45 (PTZ)
Date/Time Categorized:	11/08/2007 17:48 (PTZ)
Report Type:	Final
Report Dates:	

Notification	11/12/2007	11:24 (ETZ)
Initial Update	12/19/2007	12:50 (ETZ)
Latest Update	12/19/2007	12:50 (ETZ)
Final	12/19/2007	12:50 (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:	A5B4C01 - Communications Less Than Adequate (LTA); Verbal Communications LTA; Communication between work groups LTA A5B2C08 - Communications Less Than Adequate (LTA); Written Communication Content LTA; Incomplete / situation not covered
ISM:	5) Provide Feedback and Continuous Improvement
Subcontractor Involved:	No
Occurrence Description:	On November 8, 2007, at 1545 hours, a worker securing a storage cabinet to a sheetrock wall in the EMSL 1011 corridor drilled into an electrical conduit. The 3/4" conduit provided 120V, 15 amp, AC power to a duplex

	receptacle located in the corridor. There was no visible arc, the worker did not receive an electrical shock, and the circuit breakers did not trip. The worker utilized a cordless drill to drill into the sheetrock wall to the depth of the sheetrock. The worker then stopped as required by procedure and inspected the penetration. The worker observed what was believed to be a galvanized sheet-metal wall stud, but was actually a conduit routed up against the sheetrock. The worker proceeded to drill a 1/8" pilot hole and realized after inspecting the hole that he had drilled into the conduit. No staff were injured.
Cause Description:	A5B4C01 – Verbal Communications LTA – Communications between work groups LTA Storage cabinets were delivered to EMSL and placed along the wall in the 1011 corridor where they were would later be secured to the sheetrock. One of the storage cabinets was placed in front of a floor level receptacle hiding it from view. Therefore, the Carpenter and he did not see the receptacle before starting the installation of the cabinets. Consequently, a 1/8" hole was drilled in a 3/4" conduit containing energized 120V power that was located in the wall behind the sheetrock. (See corrective action # 3.) A5B2C08 – Written Communications Content LTA -- Incomplete / Situation not Covered SBMS requirements for blind penetrations were inadequate. The requirements do not adequately address situations where the intent is to penetrate a structural member in a hollow wall, ceiling or floor. The procedure did not specify to stop work if metal was encountered. In this event, the worker assumed he was drilling into a metal wall stud which is common and may be a preferred method of anchoring. Additional controls and review are needed when the penetration is intended to penetrate structural members in hollow walls, floors or ceilings. (See corrective action # 2.) Note: the methodology used to determine causal factors was DOE Guide 231.1-2, Occurrence Reporting Causal Analysis Guide.
Operating Conditions:	N/A
Activity Category:	Maintenance
Immediate Action(s):	Work was immediately stopped and the incident was reported to the work supervisor. The Building Engineer and Building Manager were notified and the circuit was locked and tagged out of service. A critique was held on November 9, 2007 and concluded existing procedures for Class I blind penetrations were less than adequate to prevent this event. Facility Operations and Engineering issued a Standing Order to require additional

	review whenever metallic materials are identified with hollow wall Class I blind penetrations.
FM Evaluation:	Numerous storage cabinets (50+) had been installed and anchored in this hallway in the past without incident. The staff member had been trained to the appropriate procedures and work practices and had installed most of the cabinets in this hallway in the past, using both metal stud, and hollow wall anchoring devices in the performance of this activity. Although the staff member was not injured, the potential for harm and the possibility of damage caused by drilling into conduits containing energized conductors is a serious concern. The existing procedure does not adequately address a situation where the worker intends to penetrate a structural member in a hollow wall, cavity or floor. Appropriate controls for this situation, including adequate verification that the contacted metal object was indeed a metal stud and free of other hazards are needed. Review of Similar Occurrences (see Item 37): SC-RL--PNNL-PNNLBOPER-2004-0001 In this occurrence, the staff member was drilling a blind penetration in a solid concrete floor and a 110 volt electrical lighting circuit was cut causing the circuit breaker to trip. A floor scan had been performed for this activity and the embedded material was believed to be rebar. While similar in some respects, specific methodologies and work controls for blind penetrations of the nature described in this occurrence (solid concrete floor versus hollow sheetrock wall) are very different, requiring development of a formal permit, scanning, increased PPE, and very clear steps for verifying exact identity of metallic objects contacted during penetration. SC-RL--PNNL-PNNLBOPER-2004-0013 In this occurrence, a worker severed a de-energized electrical conduit while using a circular saw to cut a hole in a hollow wall cavity. In this instance, the worker did not set the saw to the depth of the surface material and did not remove insulation material which blocked view of the conduit. Current controls for this type of activity would preclude the event if followed.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	No
Division or Project:	Facilities & Operations/Operational Systems
Plant Area:	RCHN Area

System/Building/Equipment:	EMSL
Facility Function:	Laboratory - Research & Development
Corrective Action 01:	**Target Completion Date:**12/31/2007 **Tracking ID:**ATS # 20243.17.1
	Evaluate wall scanning technology to distinguish studs from electrical conduit or other energized system.
Corrective Action 02:	**Target Completion Date:**03/31/2008 **Tracking ID:**ATS # 20243.17.2
	Review the SBMS Procedure for Blind Penetrations for applicable requirements and revise the Subject Area as necessary.
Corrective Action 03:	**Target Completion Date:**01/31/2008 **Tracking ID:**ATS # 20243.17.3
	Develop and issue Lessons Learned for sharing with Maintenance and Fabrication Services staff.
Lessons(s) Learned:	While performing blind penetrations further verification of metallic objects should be investigated before proceeding. Anchoring into metal studs is a common and sometimes preferred anchoring method and positive verification is needed while performing these types of activities. To err on the side of caution to protect the worker's safety is paramount.
HQ Keywords:	01G--Inadequate Conduct of Operations - Inadequate Procedure 01M--Inadequate Conduct of Operations - Inadequate Job Planning (Electrical) 07D--Electrical Systems - Electrical Wiring 12C--EH Categories - Electrical Safety 13E--Management Concerns - Facility Call Sheet 14D--Quality Assurance - Documents and Records Deficiency 14E--Quality Assurance - Work Process Deficiency
HQ Summary:	A worker securing a storage cabinet to sheetrock wall in the EMSL 1011 Corridor drilled into an electrical conduit containing energized conductors. The ¨ú-inch conduit provided 120V, 15 AMP, AC power to a duplex receptacle located in the corridor. There was no visible arc; the worker did not receive an electrical shock; and the circuit breakers did not trip. The worker observed what was believed to be a galvanized sheet-metal wall stud that was actually a conduit routed up against the sheetrock. The worker proceeded to drill a ¨û-inch pilot hole and realized after inspecting the hole he had drilled into a conduit. Work was immediately stopped, notifications were made, and a critique was held.
Similar OR Report Number:	1. SC-RL--PNNL-PNNLBOPER-2004-0001
	2. SC-RL--PNNL-PNNLBOPER-2004-0013
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HQ OC Notification:	Date: NA; Time: NA; Person Notified: NA; Organization: NA
Other Notifications:	Date: 11/08/2007; Time: 17:52 (PTZ); Person Notified: Higgins, R. L.; Organization: PNSO
Authorized Classifier(AC):	Pollari, R. A. Date: 12/19/2007