

December 2007 Electrical Safety Occurrences

There were 11 electrical safety occurrences for December 2007:

- 5 involved lockout/tagout (there were no hazardous energy control issues in November)
- 1 involved drilling into an electrical conduit
- 6 involved electrical workers and 5 involved non-electrical workers
- 3 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":

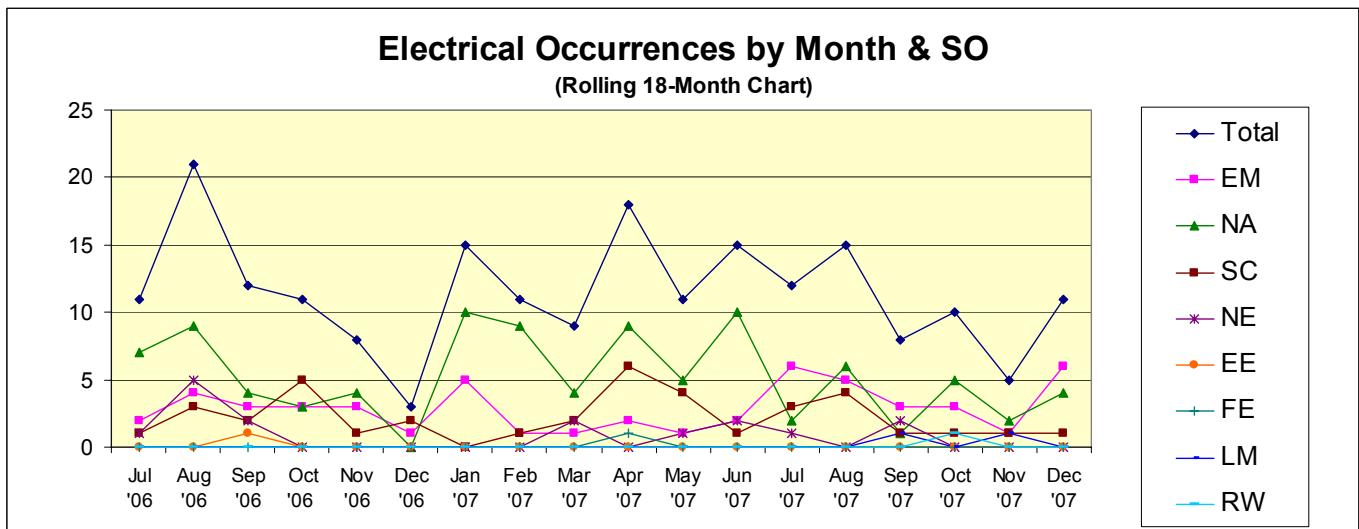
01K – Lockout/Tagout Electrical, 01M - Inadequate Job Planning (Electrical),
08A – Electrical Shock, 08J – Near Miss (Electrical), 12C – Electrical Safety

The initial search yielded 12 occurrences. However, one occurrence (NA--LASO-LANL-TA55-2007-0046) involved the repair of a T1 line and the installation of an incorrect signal cable rather than an electrical hazard. Culling out this occurrence yielded 11 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
Dec-07	11	0	0	0
2007 total	140 (avg. 11.7/month)	25	2	0
2006 total	166 (avg. 13.8/month)	26	3	0
2005 total	165 (avg. 13.8/month)	39	5	0
2004 total	149 (avg. 12.4/month)	25	3	1

The 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 – December 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-ID--BBWI-AMWTF-2007-0021	Near Miss - Exposed Wiring on Drum Cart Control Pendant Cable		X								
2	EM-ORO--BJC-X10ENVRES-2007-0012	Electrical Arc Results in a Near Miss at the MSRE Facility	X						X			
3	EM-ORO--BJC-X10ENVRES-2007-0013	Lockout/Tagout Applied to Wrong Breaker at the MSRE Facility	X						X			
4	EM-ORO--FWEC-TRUWPFAC-2007-0005	Energized Electrical Work with out a Job Specific AHA	X									
5	EM-RP--CHG-TANKFARM-2007-0015	Method Used To Lock Out Circuit Breaker Would Not Physically Prevent It From Being Energized		X					X			
6	EM-SR--WSRC-WVIT-2008-0003	Lockout Violation at 980S	X						X			
7	NA--LASO-GOLA-BOPLASO-2007-0002	Management Concern: Possible OSHA Violation Associated with Roof		X	X				X			
8	NA--LASO-LANL-TA55-2007-0043	Workers Discover Uncontrolled Hazardous Energy	X									
9	NA--SRSO-WSRC-TRIT-2007-0010	Inadvertent Lifting of Energized 110 Volt Conductor	X									
10	NA--SS-SNL-CASITE-2007-0010	Electrical Incident Involving Sheetrock Subcontractor		X	X							
11	SC--ASO-ANLE-ANLEFMS-2007-0013	Conduit with 110 Volt Energized Conductors Cut During Concrete Coring Operation Through Floor		X	X						X	
	TOTAL		6	5	3				5		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

ORPS contains 53633 OR(s) with 56951 occurrences(s) as of 3/5/2008 7:39:57 AM
 Query selected 11 OR(s) with 11 occurrences(s) as of 3/5/2008 1:57:11 PM

Download this report in Microsoft Word format. 

1)Report Number:	EM-ID--BBWI-AMWTF-2007-0021 After 2003 Redesign														
Secretarial Office:	Environmental Management														
Lab/Site/Org:	Idaho National Laboratory														
Facility Name:	ADVANCED MIXED WASTE TREATMENT FAC														
Subject/Title:	Near Miss - Exposed Wiring on Drum Cart Control Pendant Cable														
Date/Time Discovered:	12/07/2007 09:30 (MTZ)														
Date/Time Categorized:	12/07/2007 09:45 (MTZ)														
Report Type:	Update/Final														
Report Dates:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Notification</td> <td style="width: 30%;">12/07/2007</td> <td style="width: 30%;">18:53 (ETZ)</td> </tr> <tr> <td>Initial Update</td> <td>02/08/2008</td> <td>14:58 (ETZ)</td> </tr> <tr> <td>Latest Update</td> <td>02/08/2008</td> <td>14:58 (ETZ)</td> </tr> <tr> <td>Final</td> <td></td> <td></td> </tr> </table>			Notification	12/07/2007	18:53 (ETZ)	Initial Update	02/08/2008	14:58 (ETZ)	Latest Update	02/08/2008	14:58 (ETZ)	Final		
Notification	12/07/2007	18:53 (ETZ)													
Initial Update	02/08/2008	14:58 (ETZ)													
Latest Update	02/08/2008	14:58 (ETZ)													
Final															
Significance Category:	2														
Reporting Criteria:	<p>4B(5) - A facility operational event caused by deviating from a written procedure or using an inadequate procedure resulting in an adverse effect on safety, such as: an inadvertent facility or operations shutdown (i.e., a change of operational mode or curtailment of work or processes), facility or operations shutdown due to alarm response procedures, inadvertent process liquid transfer, or inadvertent release of hazardous material from its engineered containment.</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 2 occurrence)</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>														

<p>Cause Codes:</p>	<p>A3B2C02 - Human Performance Less Than Adequate (LTA); Rule Based Error; Signs to stop were ignored and step performed incorrectly -->couplet - A5B2C05 - Communications Less Than Adequate (LTA); Written Communication Content LTA; Ambiguous instructions / requirements A3B3C01 - Human Performance Less Than Adequate (LTA); Knowledge Based Error; Attention was given to wrong issues -->couplet - A5B2C05 - Communications Less Than Adequate (LTA); Written Communication Content LTA; Ambiguous instructions / requirements -->couplet - A4B2C03 - Management Problem; Resource Management LTA; Insufficient manpower to support identified goal / objective -->couplet - A4B1C04 - Management Problem; Management Methods Less Than Adequate (LTA); Management follow-up or monitoring of activities did not identify problems -->couplet - A5B4C01 - Communications Less Than Adequate (LTA); Verbal Communications LTA; Communication between work groups LTA A4B2C03 - Management Problem; Resource Management LTA; Insufficient manpower to support identified goal / objective A4B1C01 - Management Problem; Management Methods Less Than Adequate (LTA); Management policy guidance / expectations not well-defined, understood or enforced A5B4C02 - Communications Less Than Adequate (LTA); Verbal Communications LTA; Shift communications LTA A5B2C05 - Communications Less Than Adequate (LTA); Written Communication Content LTA; Ambiguous instructions / requirements A6B2C01 - Training deficiency; Training Methods Less Than Adequate (LTA); Practice or "hands-on" experience LTA A1B5C01 - Design/Engineering Problem; Operability of Design / Environment LTA; Ergonomics LTA</p>
<p>ISM:</p>	<p>2) Analyze the Hazards 3) Develop and Implement Hazard Controls</p>
<p>Subcontractor Involved:</p>	<p>No</p>
<p>Occurrence Description:</p>	<p>On 12/7/2007, an operator and a maintenance technician were attempting to operate the drum cart in the WMF-634 coring room when they discovered that the cable to the control pendant had been damaged, exposing energized wiring. At the time of discovery, the operator's hand was about a foot away from the damaged area. This presented a potential for a serious injury, and the AMWTP Nuclear Facility Manager (NFM) categorized the event as a Near Miss (criteria 10(3)3)). Following a fact finding held the same day, the NFM added two other reportability criteria: 10(2)2, Management Concern, based on the circumstances that led up to the damaged cord not being taken out of service, and 4B(5)4, because of an apparent non-compliance with AMWTP's procedure on control of equipment, including placing damaged equipment out of service and protecting against related hazards.</p>

The fact finding determined that the pendant cable was most likely damaged on 12/4/07, when the cart was lowered during operations. The Shift Team Lead did not appear to have ensured that the equipment was placed the equipment out of service properly, protected against the potential hazard, or recorded and communicated the condition properly. A work request that was submitted to repair the cable did not adequately convey the situation, i.e., that an electrical hazard existed with the cable. During the follow-on formal Root Cause investigation, the operators involved reported that they had recognized that the cord had been pinched in the scissors mechanism of the cart, rendering it inoperable, but did not recognize that this may have exposed electrical wiring within the cord, as the damaged area of the cord was not visible. The wiring in the control pendant carried 120 volt electrical current.

Cause Description:

A formal Root Cause Analysis (RCA) was performed for this event - report RCA-07-011, using the Kepner-Tregoe (KT) analysis methodology. The results of this report are summarized here.

The RCA determined the root causes to be poor conduct of operations practices, namely:

- Work was not formally stopped in accordance with MP-COPS-9.7, Control of Equipment and Systems Status. A3/B2/C02, coupled with A5/B2/C05.
- Notifications to the Shift Team Lead were not timely, in accordance with MP-COPS-9.7. A3/B3/C01, coupled with A5/B2/C05.
- The equipment status was not communicated to the Shift Manager and a log entry was not made, in accordance with MP-COPS-9.7. A3/B3/C01, coupled with A5/B2/C05 for the operator, and A3/B3/C01 coupled with A4/B2/C03 for the Shift Team Lead.
- Since notifications to the Shift Manager were not made, then requirements of MP-COPS-9.7 to determine the severity of the problem and institute compensatory measures were not performed. A3/B3/C01, coupled with A4/B1/C04.
- Equipment was not tagged "out of service" once the deficiency was recognized, in accordance with MP-COPS-9.7. A3/B3/C01, coupled with A4/B1/C04.
- Logkeeping requirements of MP-COPS-9.9, Log Keeping, were not performed to record the status of the equipment. A3/B3/C01, coupled with A4/B1/C04.
- Turnover was not performed in accordance with requirements of MP-COPS-9.1. A3/B1/C03, coupled with A4/B2/C03.

In addition to the root cause(s), the RCA also determined that several contributing causes existed, as summarized here.

- A single crew (which performed concurrent operations) was split into two crews without either clearly communicating expectations to discontinue the concurrent operations or ensuring that adequate numbers of

	<p>qualified personnel were on each crew to support such concurrent operations. Without the clear direction to discontinue the concurrent operations, the Shift Team Lead felt perceived pressure to continue the same operations with fewer personnel. A4/B2/C03 and A4/B1/C01.</p> <ul style="list-style-type: none"> - There was an unclear reporting chain for the operations personnel who worked in the coring area, with respect to reporting to the characterization Shift Team Lead versus the 628 Shift Team Lead. A5/B4/C02. - Operator responsibilities were not clear in MP-COPS-9.7. A5/B2/C05. - Management follow-up or monitoring of activities (by the 628 Shift Team Lead) did not identify problems. A3/B3/C01, coupled with A4/B1/C04. <p>The RCA also identified two other observations having bearing on the event, which are included here for completeness:</p> <ul style="list-style-type: none"> - Two coring-qualified operators had little experience with some aspects of the operation, which could have contributed to the perceived time pressure. A6/B2/C01. - Poor equipment design, in that the pendant cord showed signs that it had been pinched before, although not to the degree seen in this event. A1/B5/C01
Operating Conditions:	Coring operations were shut down at the time, and preparations for maintenance were underway.
Activity Category:	Maintenance
Immediate Action(s):	<ol style="list-style-type: none"> 1. The operator immediately unplugged the power cord, de-energizing the drum cart. 2. The operator and maintenance technician protected the area and alerted others to stay clear of the drum coring area, while they contacted the Shift Team Lead and Shift Manager. 3. Notified BBWI management and the DOE-ID Facility Representative. 4. Posted a Warning/Out-of-Service tag and lock on the power cord. 5. Paused operations in Coring and Drum Treatment areas pending an extent-of-conditions review.
FM Evaluation:	<p>This event demonstrated the importance of identifying, reporting, evaluating, logging, and mitigating equipment deficiencies and hazardous conditions. In this event, an equipment deficiency - a pinched cord that caused the drum cart to stop working - was not investigated adequately and therefore wasn't mitigated. This was compounded by failures to report the condition and log it as required by AMWTP procedures and training. As a result, personnel preparing to perform work on the equipment several days later were unaware of the potential condition of the equipment or the hazards involved. Although the EFCOG/DOE Electrical Severity Measurement Tool (revision 1) would indicate that the potential for an injury was low in this instance, the circumstances leading to the event were considered serious of reporting and a thorough investigation.</p> <p>A thorough extent of conditions review was performed for all of AMWTP</p>

	and found no other equipment deficiencies which had been identified or recognized, but not controlled adequately. In the process of performing this review, one new condition was identified and appropriate actions were taken to mitigate the condition.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	No
Division or Project:	Advance Mixed Waste Treatment Project (AMWTP)
Plant Area:	WMF-634
System/Building/Equipment:	WMF-634/Coring/Drum Cart
Facility Function:	Nuclear Waste Operations/Disposal
Corrective Action 01:	Target Completion Date: 03/26/2008 Tracking ID: 36366
	Reinforce the Conduct of Operations principles cited in the Root Cause Analysis report, i.e., control of equipment and systems status for the WMF-628 crew and log keeping globally.
Corrective Action 02:	Target Completion Date: 03/26/2008 Tracking ID: 36366
	Formalize a process for adding or changing crew responsibilities in order to identify the resource impacts such as necessary training and the number of qualified personnel needed, as well as providing a formal process to communicate management's expectations for the new activity.
Corrective Action 03:	Target Completion Date: 03/26/2008 Tracking ID: 36366
	Recombine the WMF-628 crew.
Corrective Action 04:	Target Completion Date: 03/26/2008 Tracking ID: 36366
	Revise MP-COPS-9.7, control of Equipment and Systems Status, to provide more specific direction to match the intent of the steps. Specifically, steps 3.5.3.1, 3.5.3.2, 3.5.3.3 will be revised to provide clarity. The Root Cause Analysis report identified these as areas of misunderstanding by the operators involved in this event.
Corrective Action 05:	Target Completion Date: 03/26/2008 Tracking ID: 36366
	Define the reporting chain when crews work in areas managed by someone other than their direct supervisor. MP-COPS-9.2, Operations Organization Administration, will be revised to accomplish this corrective action.
Corrective Action 06:	Target Completion Date: 03/26/2008 Tracking ID: 36366
	Engineer a means to keep the pendant cord from being able to get caught in the scissor mechanism.

Corrective Action 07:	Target Completion Date: 03/26/2008 Tracking ID: 36366								
	Create a Lessons Learned for this event.								
Lessons(s) Learned:	This event demonstrates the importance of identifying, mitigating, reporting, logging, and performing a turn over for equipment deficiencies and hazardous conditions, in order to prevent personnel from encountering hazards for which they are unprepared.								
HQ Keywords:	01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous) 01E--Inadequate Conduct of Operations - Operations Procedure Noncompliance 01R--Inadequate Conduct of Operations - Management issues 07D--Electrical Systems - Electrical Wiring 08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance 08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical) 12C--EH Categories - Electrical Safety 14E--Quality Assurance - Work Process Deficiency								
HQ Summary:	On December 7, 2007, an operator and a maintenance technician discovered a cable to the control pendant for the drum cart in the WMF-634 coring room had been damaged, exposing energized wiring. The operator immediately unplugged the power cord and secured the area. Notifications were made.								
Similar OR Report Number:	1. None								
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td>SISSON, CLINTON E</td> </tr> <tr> <td>Phone</td> <td>(208) 521-3523</td> </tr> <tr> <td>Title</td> <td>WASTE PROCESSING PRODUCTION MANAGER</td> </tr> </table>	Name	SISSON, CLINTON E	Phone	(208) 521-3523	Title	WASTE PROCESSING PRODUCTION MANAGER		
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Originator:	<table border="1"> <tr> <td>Name</td> <td>FINUP, TIMOTHY G</td> </tr> <tr> <td>Phone</td> <td>(208) 360-5918</td> </tr> <tr> <td>Title</td> <td>NUCLEAR FACILITY MANAGER</td> </tr> </table>	Name	FINUP, TIMOTHY G	Phone	(208) 360-5918	Title	NUCLEAR FACILITY MANAGER		
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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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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>12/07/2007</td> <td>10:05 (MTZ)</td> <td>R. McCarthy</td> <td>DOE-ID</td> </tr> </tbody> </table>	Date	Time	Person Notified	Organization	12/07/2007	10:05 (MTZ)	R. McCarthy	DOE-ID
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12/07/2007	10:05 (MTZ)	R. McCarthy	DOE-ID						
Authorized Classifier(AC):									

2)Report Number:	EM-ORO--BJC-X10ENVRES-2007-0012 After 2003 Redesign
Secretarial Office:	Environmental Management
Lab/Site/Org:	Oak Ridge National Laboratory
Facility Name:	Melton Valley Closure Project

Subject/Title:	Electrical Arc Results in a Near Miss at the MSRE Facility		
Date/Time Discovered:	12/08/2007 16:30 (ETZ)		
Date/Time Categorized:	12/09/2007 09:30 (ETZ)		
Report Type:	Final		
Report Dates:	Notification	12/11/2007	15:58 (ETZ)
	Initial Update	12/21/2007	14:46 (ETZ)
	Latest Update	12/21/2007	14:46 (ETZ)
	Final	12/21/2007	14:46 (ETZ)
	Revision 1	01/16/2008	09:44 (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>A3B1C07 - Human Performance Less Than Adequate (LTA); Skill Based Errors; Omission/repeating of steps based on assumptions for completion -->couplet - A4B4C04 - Management Problem; Supervisory Methods LTA; Direct supervisory involvement in task interfered with overview role A5B4C01 - Communications Less Than Adequate (LTA); Verbal Communications LTA; Communication between work groups LTA A4B1C01 - Management Problem; Management Methods Less Than Adequate (LTA); Management policy guidance / expectations not well-defined, understood or enforced</p>		
ISM:	4) Perform Work Within Controls		
Subcontractor Involved:	No		
Occurrence Description:	<p>A Near Miss incident occurred while a technician was pulling electrical leads previously disconnected by electricians through a junction box in the Drain Tank Pit (DTP). The electrical leads contacted the unknown energized lead, which subsequently came into contact with the junction box and caused a bright flash. Work was immediately terminated in the drain tank pit. The delay in categorizing this event as a SC-3 occurrence was due to the need to conduct a critique on the event. Information collected during the critique resulted in the occurrence categorization.</p>		

Detailed Description:

On December 8, 2007, work was being performed at the Molten Salt Reactor Experiment (MSRE) Project under Work Package 2006-834; Remove FDT-2 Probe, Probe Glove Box and Secondary Containment System (SCS). The Transition phase of the defueling process entails disconnecting and repositioning the probe glove box over FDT-1 and replacing the SCS. This task requires that electrical and mechanical connections be disconnected prior to the move. A pre-job brief was conducted at the beginning of the work shift to discuss disconnecting and lifting the probe glove box from the drain tank pit that was the first scope of work to be performed. This work was successfully completed and the work crew took a rest break.

After the rest break, a second pre-job brief was conducted to discuss removing the SCS from the FDT cell. There were discussions regarding the SCS lift (affect of compressed bellows) as well as how the ball valve heater wires were going to be cut, what was to be done with them, and how they would be transported safely. It was decided to cut all the existing wires and leave them in the pit for future disposition as waste materials. The need to install a remote camera and video cables was also discussed. The process for disconnecting the bellows heater cables was discussed, since there were no specific instructions for this activity in the Work Instructions. The need for clear communication and performing one step at a time was re-emphasized. The team identified specific craft or other personnel responsible for each task and annotated this on the Work Instructions. All issues discussed were reviewed and resolved to the satisfaction of the work crew and work was resumed.

The camera was installed by the Technicians and Riggers, and the Electricians connected the monitor to the remote camera. Operations personnel continued removing the ball valve heater from the ball valve per the Work Instructions using the Reader/Doer technique. During Reader/Doer work steps, the Reader was located in the pit with the workers. The Task Lead, who was following work progress with a copy of the Work Instructions, was stationed in the High Bay above the pit with clear visibility of all work activities.

The work crew had completed work steps 1 through 4 of Section 5.5.7, WP-2006-834. The work crew began work step 5 to install a plastic sleeve on the bellows. This work step could not be fully completed, as there was not enough clearance to properly tape the sleeve. It was decided to defer the taping until there was more clearance and to defer Step 6 (connect the shackle to the SCS lift ball) until it could be completed concurrently with step 13 (disconnect the SCS lower flange from the lower ball valve flange). These changes were properly documented on the Work Instruction log and are allowed per a NOTE in Section 5.4.5, of the Work Package which states:

"The sequence in which steps within sub-sections are performed may be changed at the direction of the Task Lead."

The Electricians disconnected the bellows heater cables in IP-1 as directed in the Pre-Job briefing. The Electricians asked the Task Lead if they should proceed to remove the electrical leads from the SCS bellows heater and for guidance on the location to cut the wires from the bellows if the wire was not going with the SCS. The Task Lead provided permission for work to proceed to remove the electrical leads and to cut the wires.

The Task Lead radioed the Shift Supervisor that he needed to discuss how to handle removal of the bellows heater, as well as further positioning of the remote camera. The Shift Supervisor was in the pit directly supervising installation of the remote camera. The Task Lead left his position at the top of the pit and entered the work area below for discussions with the Shift Supervisor on the camera installation. The Task Lead did not carry the Work Instructions into the pit with him and the Reader discontinued reading the steps in the Work Instructions per direction from the Task Lead.

While in the pit, the Task Lead addressed the moving and positioning of the camera. Additional questions were asked by the Electricians to the Task Lead regarding positioning of the SCS Heat Trace wires. The Electricians finished unhooking the bellows cable heater and the Technicians removed the ball valve heater. The Electricians verified breakers 4, 5, and 6 were open and in a safe condition. These breakers had previously been confirmed opened during removal of the probe from FDT 2 and had been visually re-verified by the Electricians as open prior to commencing removal of the SCS work activities.

Due to the confusion caused by multiple tasks occurring in the pit at the same time, the Task Lead thought that Step 8.a had been performed. Work Step 8.a opens the breaker and deenergizes power to the ball valve heater. The breaker is not in the pit and is located on the West wall of the high bay. This step was not performed.

As directed by the Task Lead, the electricians cut the power leads to the ball valve heater. The Electrician cut the wires at the wire nut one at a time by peeling back the electrical tape above the wire nuts and then pulling the tape back over the wire nuts, disconnected the thermocouple cables, and taped the rope to the wires.

The electrical leads were then being removed (pulled) through the junction box by an Operator with a remote handling tool with assistance (pushing) from the Electrician. The energized circuit that these wires were previously cut from came into contact with a screw on the side of the junction box and caused an electrical arc.

At the time of the arc, three separate activities were being performed simultaneously: Electrical work, removing plugs from the Maintenance Shield per Step 7 of the Work Instructions and discussions with the Shift Supervisor concerning camera positioning and removal of the ball valve heater from the pit. This condition resulted in several individuals trying to coordinate work activities at the same time, thereby causing confusion and lack of clear communication resulting in a loss of focus, elimination of a single point of contact for work direction and the Task Leads' overall span of control over work activities. The Work Instruction Reader located in the pit notified the Task Lead that she was confused on where work activities stood as stated in the Work Instructions and that the work appeared to be moving ahead of the Work Instructions. In retrospect, the Task Lead realized he should have suspended or stopped work at that time. However, the electrical arc occurred a few moments later, preempting the Task Leaders' inclination to suspend work.

Actions were taken after the event to secure the area and a LO/TO was applied to circuit #2, PDP-10. During the Critique, it was found that Lock Out/Tag Out (LO/TO) requirements had been identified in the original Hazard Identification Checklist (HIC). However, the requirement was for verifying valve closure, not electrical circuits. This requirement was subsequently deleted during Revision 1 to the Work package. It was determined by the Work Planning Committee, which included the MSRE Electrical Supervisor and craft personnel that only a single source lock out was needed, which does not require a LO/TO permit. Therefore a LO/TO permit was not identified as a requirement in Revision 1 of Work Package 2006-834. It was also determined that the conditions for application of the Single Source Lockout as defined in BJC-EH-2010, Hazardous Energy Control (Lockout/Tagout) were not met.

Cause Description:

Primary Causal Factor: A critique was held, followed by development of an Events and Causal Factors (E&CF) chart. The E&CF chart documented the sequence of work activities and events on December 8, 2007, prior to the event. Discussion of the activities also included a Change Analysis and Barrier Analysis. Causal factors were identified and corrective actions developed to prevent recurrence. The primary causal factors identified were:

- Change in Task Lead responsibilities and communications
- Reader/Doer process not followed
- Insufficient work steps to accomplish task
- Failure to stop work when need indicated
- Insufficient application of STARRT card review to task hazard
- LO/TO process not followed
- Understanding of Work Package intent for allowing flexibility of performing steps out of sequence

The potential causal factors were evaluated using the Causal Analysis Tree

(DOE G 231.1-2, Causal Analysis Guide).

The primary causal factor was determined to be A3B1C07 – Human Performance LTA – Skill Based Error – Omission/repeating of steps due to assumptions for completion. coupled with A4B4C04 (Couplet) – Management Problem – Supervisory Methods LTA – Direct supervisory involvement in task interfered with overview role. The process for performing work at MSRE is based on a "Reader/Doer" concept. One person reads the step to be performed (i.e., Reader) and the task is repeated back by the Doer so they can perform the work. The Task Lead is responsible for ensuring the process is followed and work performed per the approved Work Package. During the performance of the work, the technicians had questions regarding the installation of a camera in the "Pit" to allow work activities to be viewed. The Task Lead left his position at the top of the "Pit" to address the questions and to ensure the camera installation was completed. The Work Package and Work Instructions were left with the "Reader". The "Reader/Doer" process stopped while the Task Lead went into the "Pit". While addressing questions regarding the camera, the Electricians requested permission from the Task Lead to proceed with removal of electrical leads from a junction box and for guidance on disposal of the wires. The Work Package provided provisions for steps to be worked out of sequence if approved by the Task Lead. The Task Lead assumed the step to open the circuit had been completed and gave permission for the electricians to proceed. Multiple activities were occurring and the "Reader" indicated that the work instructions were not being followed. Observers to the work activities via the camera were not able to hear what was being said. The Shift Supervisor and Task Lead both assumed steps had been completed. When the Task Lead went to return to his position to ensure work was performed per the Work Package, an electrical arc occurred as the technicians pulled wires through the junction box. Work was suspended. When the Task Lead went into the "Pit" to answer the initial question regarding the camera installation, he had become involved in performing Direct Supervision of the work and was not able to perform the overview role of the work.

Contributing Causes:

- A5B4C01 – Communication LTA – Verbal Communication LTA – Communication between work groups LTA. During the Critique, it was found that Lock Out/Tag Out (LO/TO) requirements had been identified in the original Hazard Identification Checklist (HIC) of the Work Package. However, the requirement initially was for verifying valve closure, not for electrical circuits. This requirement was subsequently deleted during Revision 1 to the Work package. It was determined by the Work Planning Committee, which included the MSRE Electrical Supervisor and craft personnel that only a single source lock out was needed, which does not require a LO/TO permit. Therefore a LO/TO permit was not identified as a requirement in the Work Plan. There was no step in the Work Package

requiring verification that the circuit was deenergized. It was also determined that the conditions for application of the Single Source Lockout as defined in BJC-EH-2010, Hazardous Energy Control (Lockout/Tagout) were not met. A lock was not applied per BJC-EH-2010 for a Single Source Lockout.

- A4B1C01 – Management Problem – Management Methods LTA – Management policy, guidance, expectations not well defined, understood or enforced. During the Pre-Job Briefing for both morning and afternoon work activities, the project team discussed the expectation that one task would be performed at a time, the "Reader/Doer" process would be followed, assigned responsibilities for performing specific tasks, and to avoid overcrowding in the "Pit" area. The STARRT Card was reviewed, however no electrical concerns or LO/TO needs were identified. During the Pre-Job Briefing and while work was being performed tasks were identified which were not included in the Work Instructions. BJC's Work Control process states that work must not proceed if the Work Instructions are not complete or if there are changes to the work to be performed.

Extent of Condition Review:

The Extent of Condition Review for this event identified two areas that additional corrective actions are needed to address potentially similar situations at the MSRE Project:

- Within the MSRE Project, all open Work Packages associated with transition activities will be reviewed and revised as applicable for similar situations. The review will focus on ensuring that there is sufficient detail in the sequential instructions to describe the work activities. The Work Packages will be reviewed to:
 - Identify and remove any NOTE which allows work step sequencing at the discretion of the Task Lead;
 - Add a requirement to the Work Instructions which provides specific information on zero energy checks to be performed by craft (where applicable); and
 - Verify Personal Protection Equipment (PPE) requirements for electricians is correctly specified in the Hazard Identification Checklist (HIC).
- MSRE Task Leads will participate in LO/TO refresher training.
- A Lesson Learned will be generated and communicated to all BJC Projects for their evaluation and determination of the need for similar action.
- BJC-FS-1001, Work Control Process, will be revised to eliminate the ability to complete number or letter work steps out of order (Attachment B, Item 4).

Operating Conditions:	Warm Standby undergoing maintenance activity to remove equipment
Activity Category:	Maintenance
Immediate Action(s):	Work was immediately suspended, the circuit was deenergized, a Lockout/Tagout (LO/TO) was put in place and all circuits in the junction box were verified as deenergized. A meeting was held to discuss the events which led to the incident, and a critique was scheduled for the following day.

FM Evaluation:	Update 1/16/2008: Revised final report issued to reflect the addition of a new corrective action (number 10) to perform an extent of condition review of the two areas at MSRE that are the greatest facility hazards. There were no personnel injuries as a result of the incident. Work in the DTP has been suspended until further notice.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	No
Division or Project:	Molten Salt Reactor Experiment (MSRE)
Plant Area:	Drain Tank Pit
System/Building/Equipment:	Building 7503 High Bay
Facility Function:	Environmental Restoration Operations
Corrective Action 01:	Target Completion Date: 12/14/2007 Tracking ID: I0066882
	Conduct retraining on the LO/TO program for MSRE Task Leads, craft, technicians, engineers, and work planners.
Corrective Action 02:	Target Completion Date: 12/20/2007 Tracking ID: I0066882
	Review and revise Work Package WP-2006-834 to ensure that there is sufficient detail in the sequential instructions to describe the work activities. The Work Packages will be reviewed and revised to: - Identify and remove any NOTE which allows work step sequencing at the discretion of the Task Lead; - Clarify electrical cable disposition, - Add a requirement to the Work Instructions which provides specific information on zero energy checks to be performed by craft (where applicable); and - Verify Personal Protection Equipment (PPE) requirements for electricians is correctly specified in the Hazard Identification Checklist (HIC)
Corrective Action 03:	Target Completion Date: 12/21/2007 Tracking ID: I0066882
	Review and revise Work Packages WP-2006-832 and WP-2006-833 to ensure that there is sufficient detail in the sequential instructions to describe the work activities. The Work Packages will be reviewed and revised to: - Identify and remove any NOTE which allows work step sequencing at the discretion of the Task Lead; - Add a requirement to the Work Instructions which provides specific information on zero energy checks to be performed by craft (where applicable); and - Verify PPE requirements for electricians is correctly specified in the Hazard Identification Checklist (HIC).

Corrective Action 04:	Target Completion Date: 12/21/2007 Tracking ID: I0066882
	Conduct a detailed walkdown of the Work Packages WP-2006-832, 2006-833, and 2006-834 at the work area to validate the work instructions and incorporate any changes and Lessons Learned into the final work package.
Corrective Action 05:	Target Completion Date: 12/19/2007 Tracking ID: I0066882
	Install electrical LO/TO to de-energize all energy sources related to the probe, probe glovebox, hose connection glovebox, and related Heat Trace Circuits in the DTP with the exception of lighting and electrical outlets.
Corrective Action 06:	Target Completion Date: 12/17/2007 Tracking ID: I0066882
	Write a lift plan for Secondary Containment System (SCS) movement.
Corrective Action 07:	Target Completion Date: 12/14/2007 Tracking ID: I0066882
	Conduct MSRE All-Hands briefing to review expectations for: <ul style="list-style-type: none"> - Stop work/Suspend work/Time out - Expectations for use of STARRT Card - Performing steps in sequence - Reader/Doer process
Corrective Action 08:	Target Completion Date: 01/11/2008 Tracking ID: I0066882
	Issue a formal Lessons Learned statement for other BJC Projects and the DOE Complex.
Corrective Action 09:	Target Completion Date: 01/31/2008 Tracking ID: I0066882
	Revise BJC-FS-1001, Work Control Process, to eliminate the ability to complete numbered or lettered work steps out of order (Attachment B, Item 4).
Corrective Action 10:	Target Completion Date: 01/15/2008 Tracking ID: I0066882
	To verify that there are no similar unidentified precursor elements, BJC will perform a focused Extent of Condition review on the two areas that are the greatest facility hazards: <ul style="list-style-type: none"> - Reagent Gas Operations - Hoisting and Rigging
Lessons(s) Learned:	The BJC Work Control process defines actions to be taken to ensure work is performed per approved Work Packages and that work is stopped when changes are identified. Work activities at MSRE during the morning of December 8, 2007, were performed per processes and controls which were in place. During the afternoon work activities, work processes were not followed and multiple activities were allowed to proceed in a manner different than that in the approved Work Package. This resulted in a near miss incident. All personnel must remember their responsibility to suspend work when work processes are not being followed as defined.
HQ Keywords:	01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations

(miscellaneous)
 01F--Inadequate Conduct of Operations - Training Deficiency
 01G--Inadequate Conduct of Operations - Inadequate Procedure
 01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical)
 01M--Inadequate Conduct of Operations - Inadequate Job Planning (Electrical)
 01P--Inadequate Conduct of Operations - Inadequate Oral Communication
 01R--Inadequate Conduct of Operations - Management issues
 08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical)
 12K--EH Categories - Near Miss (Could have been a serious injury or fatality)
 14B--Quality Assurance - Training and Qualification Deficiency
 14D--Quality Assurance - Documents and Records Deficiency
 14E--Quality Assurance - Work Process Deficiency

HQ Summary: A near miss incident occurred while a technician was pulling electrical leads previously disconnected by electricians through a junction box in the Drain Tank Pit. The electrical leads touched an unknown energized lead, which subsequently touched the junction box, and caused a bright flash. Work was immediately suspended, the circuit was de-energized, a lockout/tagout was put in place, all circuits in the junction box were verified as de-energized, and a critique was held.

Similar OR Report Number:
 1. NA--SS-SNL-NMFAC-2007-0004
 2. SC--ASO-GOCH-DOEARGONNE-2007-0001

Facility Manager:

Name	John Ettien
Phone	(865) 574-7211
Title	Facility Manager

Originator:

Name	SMITH, MILDRED L
Phone	(865) 241-1703
Title	QUALITY ENGINEER

HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

Other Notifications:

Date	Time	Person Notified	Organization
12/08/2007	16:30 (ETZ)	Craig Eutz	BJC-FM
12/08/2007	16:30 (ETZ)	Gary Love	DOE-FR
12/08/2007	16:30 (ETZ)	Steve Smith	BJC-MOP
12/08/2007	16:30 (ETZ)	Gary Riner	DOE-FPD
12/08/2007	16:30 (ETZ)	Darrell Worrell	DOE-FR

Authorized Classifier(AC): Dave Hamrin Date: 01/15/2008

3)Report Number:	EM-ORO--BJC-X10ENVRES-2007-0013 After 2003 Redesign		
Secretarial Office:	Environmental Management		
Lab/Site/Org:	Oak Ridge National Laboratory		
Facility Name:	Melton Valley Closure Project		
Subject/Title:	Lockout/Tagout Applied to Wrong Breaker at the MSRE Facility		
Date/Time Discovered:	12/13/2007 09:00 (ETZ)		
Date/Time Categorized:	12/17/2007 09:05 (ETZ)		
Report Type:	Final		
Report Dates:	Notification	12/18/2007	15:41 (ETZ)
	Initial Update	01/14/2008	13:59 (ETZ)
	Latest Update	01/14/2008	13:59 (ETZ)
	Final	01/14/2008	13:59 (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:	A3B1C01 - Human Performance Less Than Adequate (LTA); Skill Based Errors; Check of work was LTA -->couplet - NA A3B1C02 - Human Performance Less Than Adequate (LTA); Skill Based Errors; Step was omitted due to distraction -->couplet - NA		
ISM:	4) Perform Work Within Controls		
Subcontractor Involved:	No		
Occurrence Description:	<p>The MSRE Facility Manager was notified by the Oak Ridge National Laboratory (ORNL) Lab Shift Superintendent (LSS) at 0851 hours regarding alarms received in the Waste Operations Control Center (WOCC) from MSRE. On further investigation, it was determined that a Lockout/Tagout (LO/TO) had been applied to the wrong breaker (breaker #3 in Panel UPS - 1).</p> <p>This event was initially categorized as a violation of a procedure SC-4 occurrence under reporting criteria 4B(5)4. Based on further investigation, this occurrence has been recategorized to a Significance Category 3 occurrence under reporting criteria 2C(2).</p>		
Cause Description:	A critique was held followed by development of an Events and Causal		

Factors (E&CF) chart. The E&CF chart documented the sequence of work activities prior to the event. Causal factors were identified, a Barrier Analysis completed, and corrective actions developed to prevent recurrence. The primary causal factors identified were:

- LO/TO process not followed
- Inattention to detail

The potential causal factors were evaluated using the Causal Analysis Tree (DOE G 231.1-2, Causal Analysis Guide). The primary causal factor was determined to be A3B1C01 – Human Performance LTA – Skill Based Error – Check of Work was Less-Than-Adequate (LTA). In response to a corrective action from occurrence BJC-X10ENVRES-2007-0012, two breakers were to have an electrical LO/TO applied to de-energize all energy sources related to the probe, probe glovebox, hose connection glovebox, and related Heat Trace Circuits in the high bay Drain Tank Pit (DTP) with the exception of lighting and electrical outlets. This permit was to be completed prior to a work planning meeting to be held that morning. The work planning meeting participants were directed to wait until the Craft Supervisor and Electricians completed the LO/TO permit installation prior to beginning their walkdown of the work package instructions.

Prior to starting work on the LO/TO installation, a STARRT Card was completed by the Craft Supervisor and the Electricians to discuss electrical hazards and to review LO/TO Permit Number 16152. Two tags were to be installed per this LO/TO Permit. The LO/TO was installed and verified for Breaker #3, PDP-10. The crew went to the basement to install the second LO/TO on UPS Panel Breaker #11. The Craft Supervisor was distracted with questions from a project engineer. The Craft Supervisor misread the LO/TO Permit and told the Electrician to install the lock on UPS Panel Breaker #3. The Electrician installed the LO/TO on Breaker #3. The installation should have been independently verified per BJC-EH-2002, Hazardous Energy Control (Lockout/Tagout). Although the LO/TO was installed on UPS Panel Breaker #3, the permit was signed by both the Electricians and the Craft Supervisor indicating it had been installed and independently verified as being placed on UPS Panel Breaker #11.

Although LO/TO Permit Number 16152 indicated that the installation had been completed and independently verified for the UPS Panel Breaker #11, the LO/TO had been installed incorrectly on UPS Panel Breaker #3. The independent verification was not performed as defined in BJC-EH-2002.

On 12/11/2007 and 12/12/2007, the Craft Supervisor and both of the Electricians attended retraining on the LO/TO process and requirements. On 12/12/2007, all MSRE staff attended a mandatory all-hands meeting to review expectations for Stop work/Suspend work/Time out and expectations for use of STARRT Card. Both of these actions were in response to

	<p>corrective actions from occurrence BJC-X10ENVRES-2007-0012. Based on the results of the investigation for this event (BJC-X10ENVRES-2007-0013), there is no couplet for this causal factor. Corrective actions in this report will address the potential extent of condition from this event.</p> <p>Extent of Condition Review: The Extent of Condition Review for this event is to ensure the newly-assigned electrical supervisor and electricians complete the appropriate training/qualification process prior to performing work at MSRE. Additionally, the electrical supervisor and the electricians supporting the MSRE Project participated in a walk-down of current open work packages and their associated LO/TO permits at MSRE. Both of these actions were completed prior to resuming electrical work at MSRE.</p>		
Operating Conditions:	Warm Standby undergoing maintenance activity to remove equipment		
Activity Category:	Maintenance		
Immediate Action(s):	The incorrect LO/TO was removed and a new permit issued to LO/TO the correct circuit. Neither personnel nor equipment were affected by this event.		
FM Evaluation:	A LO/TO permit was issued to open two breakers to complete a previously identified corrective action: Breaker #3 in panel PDP - 10 (power source for process gas heat trace in the high bay Drain Tank Pit (DTP), and Breaker #11 in Panel UPS – 1 (power source for the melter probe instruments in the DTP). As noted in the Description of Occurrence, breaker #3 in Panel UPS – 1 was tagged out instead of the permit required breaker #11. The investigation revealed that the craft supervisor was distracted on two separate occasions while performing as the reader for the electrician’s hanging and verifying the breaker disconnect and mistakenly read breaker #3 to the electrician applying the LO/TO. It was also determined that no independent verification was performed as required by LO/TO procedure, BJC-EH-2002.		
DOE Facility Representative Input:			
DOE Program Manager Input:			
Further Evaluation is Required:	No		
Division or Project:	Molten Salt Reactor Experiment (MSRE)		
Plant Area:	Drain Tank Pit		
System/Building/Equipment:	Building 7503 High Bay		
Facility Function:	Environmental Restoration Operations		
Corrective Action 01:	<table border="1"> <tr> <td>Target Completion Date:01/10/2008</td> <td>Tracking ID:I0066911</td> </tr> </table>	Target Completion Date: 01/10/2008	Tracking ID: I0066911
Target Completion Date: 01/10/2008	Tracking ID: I0066911		
	Obtain the services of replacement electricians to complete the remaining fuel removal scope and ensure they are trained and qualified to all facility pre-requisites.		

Corrective Action 02:	Target Completion Date: 01/10/2008 Tracking ID: I0066911																
	Electricians will participate in a walk-down of any current open work packages and will review associated open LO/TO permits at MSRE prior to beginning work.																
Lessons(s) Learned:	Work activities must be performed in accordance with defined procedures and processes. These processes are in place to protect workers and to ensure work is performed safely. Prior to signing that a work activity has been completed as defined, the checks and verification defined in the process must be performed as specified.																
HQ Keywords:	01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous) 01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical) 01Q--Inadequate Conduct of Operations - Personnel error 01R--Inadequate Conduct of Operations - Management issues 12I--EH Categories - Lockout/Tagout (Electrical or Mechanical) 14E--Quality Assurance - Work Process Deficiency																
HQ Summary:	After alarms were received in the Waste Operations Control Center from MSRE, investigators determined that a lockout/tagout had been applied to the wrong circuit breaker. A craft supervisor was distracted and mistakenly read breaker #3 to the electrician who was performing the lockout/tagout instead of breaker #11. It was also determined that no independent verification was performed as required. The incorrect lockout/tagout was removed and a new permit issued to lockout the correct circuit.																
Similar OR Report Number:	1. EM-ID--BBWI-AMWTF-2005-0018 2. NE-ID--BEA-SMC-2005-0006																
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td>John Ettien</td> </tr> <tr> <td>Phone</td> <td>(865) 574-7211</td> </tr> <tr> <td>Title</td> <td>Facility Manager</td> </tr> </table>	Name	John Ettien	Phone	(865) 574-7211	Title	Facility Manager										
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Phone	(865) 574-7211																
Title	Facility Manager																
Originator:	<table border="1"> <tr> <td>Name</td> <td>SMITH, MILDRED L</td> </tr> <tr> <td>Phone</td> <td>(865) 241-1703</td> </tr> <tr> <td>Title</td> <td>QUALITY ENGINEER</td> </tr> </table>	Name	SMITH, MILDRED L	Phone	(865) 241-1703	Title	QUALITY ENGINEER										
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Phone	(865) 241-1703																
Title	QUALITY ENGINEER																
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Authorized Classifier(AC):	David Hamrin Date: 12/18/2007																

4)Report Number:	EM-ORO--FWEC-TRUWPFAC-2007-0005 After 2003 Redesign		
Secretarial Office:	Environmental Management		
Lab/Site/Org:	Oak Ridge Operations		
Facility Name:	TRU Waste Processor FAC		
Subject/Title:	Energized Electrical Work with out a Job Specific AHA		
Date/Time Discovered:	12/12/2007 07:00 (ETZ)		
Date/Time Categorized:	12/14/2007 08:42 (ETZ)		
Report Type:	Final		
Report Dates:	Notification	12/14/2007	17:29 (ETZ)
	Initial Update	12/17/2007	11:51 (ETZ)
	Latest Update	02/05/2008	17:24 (ETZ)
	Final	02/05/2008	17:24 (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:	A4B3C08 - Management Problem; Work Organization & Planning LTA; Job scoping did not identify special circumstances and/or conditions		
ISM:	3) Develop and Implement Hazard Controls		
Subcontractor Involved:	No		
Occurrence Description:	<p>Description of Occurrence: Contact Handled Glove Box (CHGB) ventilation low flow alarm set point work was observed by the TWPC DOE Facility Representative, who questioned if the appropriate safety precautions were in place. The TWPC DOE Facility Representative addressed his questions to the TWPC Director of Safety, Health and Quality (SH&Q), who stopped work and directed that an internal incident report was written and an investigation commenced as required by TWPC procedure CM-P-IS-015, Rev 1, Incident Reporting and Investigation.</p> <p>The preliminary investigation results reveal that TWPC Electrical Safety Procedure T-CM-P-IS-008 Section 6 step 6.1 requires that if a circuit cannot be de-energized, obtain approvals and take precautions required by this procedure before proceeding with the work. A task specific AHA prepared, in accordance with T-CM-FW-P-IS-007, Activity Hazard Analysis, will be required in such cases, as well as completion of Attachment E, Electrical Work Authorization Form, for authorization from the OM and the HSO.</p>		

	In this instance this requirement was not met. The work of setting the Contact Handled Glove Box (CHGB) ventilation low flow alarm set point was commenced utilizing the Activity Hazard Analysis CM-07-208 for the installation DCN ICO 078 which installed the CHGB ventilation low flow alarm and did not address the hazards of testing the equipment after installation. Activity Hazard Analysis CM-07-208 only addressed the hazards and controls for the installation of the equipment.
Cause Description:	The hazard controls documented were not detailed enough in that the additional control needed for the testing phase of the work sequence did not specify work area barriers.
Operating Conditions:	Facility Mode was Standby
Activity Category:	Facility/System/Equipment Testing
Immediate Action(s):	<ol style="list-style-type: none"> 1. Stopped Work on the CHGB ventilation low flow alarm setpoint at 0710 12/12/2007 2. Initiated Internal investigation 3. All Energized Electrical Work must be approved by the Director of Safety Health and Quality until the completion of the investigation and corrective actions are determined
FM Evaluation:	<p>UPDATE 12/17/2007 1200</p> <p>This update is issued to change the reporting criteria from a 2(C)2 to a 2(C)3. Criteria 2(C)2 was selected in error.</p> <p>During the installation of the Contact Handled Glove box (CHGB) Local Glove Box Exhaust Alarm Panel in accordance with Design Change Notice (DCN)-IC-078 the qualified electrician/Instrument Technician evaluated the work being performed as low hazard work. He was adjusting the dip switches on a 24vdc relay. He was aware of the presence of an exposed 120vac transformer and did not consider the exposed 120vac transformer as an immediate hazard. Consequently he did not feel that he was working on or around energized electrical equipment and did not implement the controls requiring barriers around energized equipment. In his opinion he had adequate separation and work instructions to conduct the work he was accomplishing. Had he been more conservative in his interpretations of the electrical safety requirements and pointed out to the personnel who approved the CM-FW-P-IS-008 Electrical Work Authorization that there was a exposed 120vac transformer 4 to 6 inches from where he was working they may have specified that a barrier be established in the work area. Consequently the work was approved and commenced without barriers in place to protect the surrounding workers, as soon as this was discovered a work suspension order was put in place and the work was stopped until barriers were put in place and documented on the appropriate work control forms to protect the worker conducting the work and the surrounding workers. Additional compensatory measures for planning and approving electrical work were also put in place.</p>

DOE Facility Representative Input:			
DOE Program Manager Input:			
Further Evaluation is Required:	No		
Division or Project:	TRU Project		
Plant Area:	Room 231		
System/Building/Equipment:	7880 /Contact Handled Waste Glove Box Ventilation Low Flow		
Facility Function:	Nuclear Waste Operations/Disposal		
Corrective Action 01:	<table border="1"> <tr> <td>Target Completion Date:12/12/2007</td> <td>Actual Completion Date:12/12/2007</td> </tr> </table>	Target Completion Date: 12/12/2007	Actual Completion Date: 12/12/2007
Target Completion Date: 12/12/2007	Actual Completion Date: 12/12/2007		
	Work Suspension Order WSO# 2007-001 was issued and work stopped		
Corrective Action 02:	<table border="1"> <tr> <td>Target Completion Date:12/12/2007</td> <td>Actual Completion Date:01/10/2008</td> </tr> </table>	Target Completion Date: 12/12/2007	Actual Completion Date: 01/10/2008
Target Completion Date: 12/12/2007	Actual Completion Date: 01/10/2008		
	Internal investigation IR 2007-019 commenced. Investigation report issued 1/10/08		
Corrective Action 03:	<table border="1"> <tr> <td>Target Completion Date:12/12/2007</td> <td>Actual Completion Date:12/12/2007</td> </tr> </table>	Target Completion Date: 12/12/2007	Actual Completion Date: 12/12/2007
Target Completion Date: 12/12/2007	Actual Completion Date: 12/12/2007		
	Implement additional reviews of electrical work, all Energized electrical Work must be approved by the Safety, Health and Quality Director prior to commencing work.		
Lessons(s) Learned:	It is necessary for the personnel to have a full understanding of the scope of work to be completed prior to approving controls to mitigate the hazards involved in the work activities.		
HQ Keywords:	01M--Inadequate Conduct of Operations - Inadequate Job Planning (Electrical) 01O--Inadequate Conduct of Operations - Inadequate Maintenance 12C--EH Categories - Electrical Safety 14E--Quality Assurance - Work Process Deficiency		
HQ Summary:	While technicians were working on the Contact Handled Glove Box (CHGB) ventilation low flow alarm set point, a DOE Facility Representative questioned if the appropriate safety precautions were in place. The work was stopped and a preliminary investigation revealed that energized work was being performed without approval. The work of setting the CHGB ventilation low flow alarm set point was commenced using the Activity Hazard Analysis CM-07-208 for the installation DCN ICO 078, which did not address the hazards of working on energized equipment. An internal investigation was initiated and all energized electrical work must be approved by the Director of Safety Health and Quality until the completion of the investigation and corrective actions are determined.		

Similar OR Report Number:	1. None			
Facility Manager:	Name	THOMPSON, CHRIS		
	Phone	(865) 574-3441		
	Title	FACILITIES MANAGEMENT DIRECTOR		
Originator:	Name	THOMPSON, CHRIS		
	Phone	(865) 574-3441		
	Title	FACILITIES MANAGEMENT DIRECTOR		
HQ OC Notification:	Date	Time	Person Notified	Organization
	NA	NA	NA	NA
Other Notifications:	Date	Time	Person Notified	Organization
	12/12/2007	07:30 (ETZ)	Chris Thompson	TWPC DFM
	12/12/2007	07:30 (ETZ)	Tony Buhl	TWPC GM
	12/12/2007	07:30 (ETZ)	Rick Farr	DOE FR
	12/12/2007	07:30 (ETZ)	Bob McKay	TWPC DGM
	12/12/2007	09:30 (ETZ)	Bill McMillian	DOE PM
Authorized Classifier(AC):				

5)Report Number:	EM-RP--CHG-TANKFARM-2007-0015 After 2003 Redesign		
Secretarial Office:	Environmental Management		
Lab/Site/Org:	Hanford Site		
Facility Name:	Tank Farms		
Subject/Title:	Method Used To Lock Out Circuit Breaker Would Not Physically Prevent It From Being Energized		
Date/Time Discovered:	12/13/2007 14:00 (PTZ)		
Date/Time Categorized:	12/13/2007 15:15 (PTZ)		
Report Type:	Update		
Report Dates:	Notification	12/17/2007	17:09 (ETZ)
	Initial Update	01/30/2008	13:57 (ETZ)
	Latest Update	01/30/2008	14:02 (ETZ)
	Final		
Significance Category:	3		
Reporting Criteria:	10(2) - An event, condition, or series of events that does not meet any of the other reporting criteria, but is determined by the Facility Manager or line management to be of safety significance or of concern to other facilities or activities in the DOE complex. One of the four significance categories should be assigned to the occurrence, based on an evaluation of the potential		

	risks and the corrective actions taken. (1 of 4 criteria - This is a SC 3 occurrence)
Cause Codes:	
ISM:	3) Develop and Implement Hazard Controls
Subcontractor Involved:	No
Occurrence Description:	<p>On 10/29/2007, an "Authorized Worker Single Point Lockout/Tagout" was installed to correct electrical discrepancies for the 241-AN-101 pump. The work was completed, and the "Authorized Worker Single Point Lockout/Tagout" was removed.</p> <p>On 12/13/2007, during the installation of an "Authorized Worker Single Point Lockout/Tagout" on the same circuit breaker located in 241-AZ-156, employees discovered that the method used to lock the circuit breaker on 10/29/2007 would not physically prevent the circuit breaker from being energized. Safe-to-work checks performed at work locations on 10/29/2007 did not identify any energized electrical components. In addition, employees are trained not to operate equipment with an installed Authorized Worker Lock & Tag Danger Tag.</p> <p>As a result, this occurrence was categorized as a Group 10(2) SC (3), Management Concern.</p>
Cause Description:	
Operating Conditions:	Does not apply.
Activity Category:	Maintenance
Immediate Action(s):	<p>Suspended the work that relied on the "Authorized Worker Single Point Lockout/Tagout" at subject circuit breaker.</p> <p>Placed Red Arrow restriction in Waste Feed Operations Senior Shift Manager logbook which states: "Do not use Westinghouse / Siemen-Allis / Eaton / or Cutler-Hammer SPB 100 circuit breakers for Lock & Tag or Authorized Worker isolation points until the breaker operation and locking technique has been evaluated."</p> <p>Informed Closure Operations and 222-S Lab Operations Shift Managers of the issue.</p>
FM Evaluation:	<p>UPDATE - 01/30/2008</p> <p>This UPDATE is being submitted to extend the due date of this occurrence report to 02/27/2007.</p> <p>An extension is necessary to allow Problem Evaluation Request CH2M-PER-2007-2271 resolution and supporting documentation acceptance review.</p> <p>A further UPDATE or FINAL REPORT will be submitted no later than</p>

	02/27/2007.															
DOE Facility Representative Input:																
DOE Program Manager Input:																
Further Evaluation is Required:	Yes. Before Further Operation? No By Whom: By When:															
Division or Project:	CH2MHILL/Office of River Protection															
Plant Area:	200 East															
System/Building/Equipment:	Electrical/241-AZ-156/Breaker Panel															
Facility Function:	Nuclear Waste Operations/Disposal															
Corrective Action:																
Lessons(s) Learned:																
HQ Keywords:	01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical) 12I--EH Categories - Lockout/Tagout (Electrical or Mechanical) 14E--Quality Assurance - Work Process Deficiency															
HQ Summary:	On December 13, 2007, during installation of an "Authorized Worker Single Point Lockout/Tagout" on a pump circuit breaker, employees discovered that the method used to lockout the same circuit breaker in October would not physically prevent the circuit breaker from being energized. The safe-to-work checks performed in October did not identify any energized electrical components. Work that relies on the "Authorized Worker Single Point Lockout/Tagout" at the subject circuit breaker has been suspended.															
Similar OR Report Number:																
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td colspan="3">Jarecki, Theodore D</td> </tr> <tr> <td>Phone</td> <td colspan="3">(509) 373-0956</td> </tr> <tr> <td>Title</td> <td colspan="3">Manager, WFO Shift Operations</td> </tr> </table>				Name	Jarecki, Theodore D			Phone	(509) 373-0956			Title	Manager, WFO Shift Operations		
Name	Jarecki, Theodore D															
Phone	(509) 373-0956															
Title	Manager, WFO Shift Operations															
Originator:	<table border="1"> <tr> <td>Name</td> <td colspan="3">WATERS, SHAUN F</td> </tr> <tr> <td>Phone</td> <td colspan="3">(509) 373-3457</td> </tr> <tr> <td>Title</td> <td colspan="3">OPERATIONS SPECIALIST</td> </tr> </table>				Name	WATERS, SHAUN F			Phone	(509) 373-3457			Title	OPERATIONS SPECIALIST		
Name	WATERS, SHAUN F															
Phone	(509) 373-3457															
Title	OPERATIONS SPECIALIST															
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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NA	NA	NA	NA													
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Date	Time	Person Notified	Organization													
12/13/2007	15:00 (PTZ)	Wright, M. A.	CH2MHILL													
12/13/2007	15:26 (PTZ)	Ross, W. E.	CH2MHILL													

	12/13/2007	15:35 (PTZ)	Sorensen, R. C.	ORP
	12/13/2007	16:07 (PTZ)	Crary, N. L. Jr.	ONC

Authorized Classifier(AC):

6)Report Number:	EM-SR--WSRC-WVIT-2008-0003 After 2003 Redesign		
Secretarial Office:	Environmental Management		
Lab/Site/Org:	Savannah River Site		
Facility Name:	Vitrification Facility		
Subject/Title:	Lockout Violation at 980S		
Date/Time Discovered:	12/17/2007 12:23 (ETZ)		
Date/Time Categorized:	02/04/2008 13:15 (ETZ)		
Report Type:	Notification		
Report Dates:	Notification	02/04/2008	14:22 (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:	6) N/A (Not applicable to ISM Core Functions as determined by management review.)		
Subcontractor Involved:	No		
Occurrence Description:	<p>On 12/03/07, two single point lockouts, which were installed to support maintenance work on a fan motor, were found to be incorrectly installed. The event was classified as reporting criteria 2(c)3 which resulted in STAR Problem Report 2007-CTS-015209 being issued. Subsequent evaluation has determined the need to reclassify this event as ORPS 2(c)2. The lockouts, SP-DWPF-NP-07-1254 and 1255, required circuit #16 on panel Y201 to be in the OFF position. However, the lockout was installed in error in the ON position. Absence of voltage checks were performed in accordance with the process and verified no voltage present at the work area. No work was performed on any energized equipment.</p> <p>After the work was performed, a management walkdown identified the</p>		

	<p>lockout installation error. The shift manager was notified and the work area safely secured. The subsequent investigation found that although the prescribed hazardous energy process was followed, human error resulted in incorrect lockout installation . The investigation determined that a relay in the system control circuitry and a local maintenance disconnect switch prevented the motor from being energized, however they were not controlled per the prescribed lockout.</p> <p>A critique of this event was conducted at 1430 on 12/17/07.</p> <p>Note: This event was originally categorized on 12/18/2007 at 1054 as a 2C(3), a Non-ORPS Reportable event. According to Site procedure, the event was tracked as Non-ORPS Reportable in STAR item 2007-CTS-015209.</p>
Cause Description:	To be determined.
Operating Conditions:	DWPF is in Normal Radioactive Operations
Activity Category:	Normal Operations (other than Activities specifically listed in this Category)
Immediate Action(s):	Shift Manager was notified and the work area secured until the lockout installation could be corrected. Facility work involving documented lockouts and single point lockouts was suspended until verification completed that all other lockouts were properly installed. This walkdown verification found all other facility lockouts to be properly installed.
FM Evaluation:	Evaluation of the lockout violation has been completed and determined that the Single Point Lockout Tagout, SPLT, that was hung was not in the proper position with regards to personnel safety. No work performed on energized circuits. Critique held at 1430 12/17/07.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	Yes. Before Further Operation? No By Whom: Issue Coordinator By When: 03/20/2008
Division or Project:	Liquid Waste Operations/ DWPF
Plant Area:	S-Area
System/Building/Equipment:	Building Ventilation/980-S/exhauster
Facility Function:	Nuclear Waste Operations/Disposal
Corrective Action:	
Lessons(s) Learned:	To be determined.
HQ Keywords:	01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical) 12I--EH Categories - Lockout/Tagout (Electrical or Mechanical)

	13E--Management Concerns - Facility Call Sheet 14E--Quality Assurance - Work Process Deficiency																																			
HQ Summary:	On December 3, 2007, two single point lockouts, which were installed to support maintenance work on a fan motor, were found to be incorrectly installed. The lockouts required the circuit on the panel to be in the OFF position; however, the lockout was installed in error in the ON position. Absence of voltage checks were performed and verified no voltage was present at the work area. A relay in the system control circuitry and a local maintenance disconnect switch prevented the motor from being energized, however they were not controlled per the prescribed lockout. A subsequent management walkdown identified the lockout installation error. A critique was held on December 17, 2007. (This event was initially determined not to be ORPS reportable, but has been reclassified.)																																			
Similar OR Report Number:	1. To be determined.																																			
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td colspan="3">WILKERSON, STEVEN W</td> </tr> <tr> <td>Phone</td> <td colspan="3">(803) 208-7143</td> </tr> <tr> <td>Title</td> <td colspan="3">FACILITY MANAGER</td> </tr> </table>				Name	WILKERSON, STEVEN W			Phone	(803) 208-7143			Title	FACILITY MANAGER																						
Name	WILKERSON, STEVEN W																																			
Phone	(803) 208-7143																																			
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Originator:	<table border="1"> <tr> <td>Name</td> <td colspan="3">YOUNG, HAROLD K</td> </tr> <tr> <td>Phone</td> <td colspan="3">(803) 208-6588</td> </tr> <tr> <td>Title</td> <td colspan="3">ISSUE ADMINISTRATOR</td> </tr> </table>				Name	YOUNG, HAROLD K			Phone	(803) 208-6588			Title	ISSUE ADMINISTRATOR																						
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Authorized Classifier(AC):	N/A Date: 02/04/2008																																			

7)Report Number:	NA--LASO-GOLA-BOPLASO-2007-0002 After 2003 Redesign
Secretarial Office:	National Nuclear Security Administration
Lab/Site/Org:	Los Alamos Site
Facility Name:	Balance of Plant Los Alamos Site Office
Subject/Title:	Management Concern: Possible OSHA Violation Associated with Roof

	Repair		
Date/Time Discovered:	12/07/2007 12:00 (MTZ)		
Date/Time Categorized:	12/12/2007 09:15 (MTZ)		
Report Type:	Final		
Report Dates:	Notification	12/17/2007	19:23 (ETZ)
	Initial Update	01/25/2008	19:33 (ETZ)
	Latest Update	02/15/2008	17:23 (ETZ)
	Final	02/15/2008	17:23 (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:	A5B4C01 - Communications Less Than Adequate (LTA); Verbal Communications LTA; Communication between work groups LTA A5B3C01 - Communications Less Than Adequate (LTA); Written Communications Not Used; Lack of written communication		
ISM:	4) Perform Work Within Controls		
Subcontractor Involved:	Yes National Roofing		
Occurrence Description:	<p>MANAGEMENT SYNOPSIS: This event was originally categorized as "Personnel exposure to chemical, biological or physical hazards above limits established by the Occupational Safety and Health Administration (OSHA)" (Group 6A(5)) because of the possibility worker exposure to asbestos above 29 CFR Part 1910 limits. However, during the critique on December 12, 2007, it was determined by the industrial hygienist that asbestos exposure above those limits was not likely. Due to this discussion, the event has been re-categorized the event as a Management Concern.</p> <p>Roofers with National Roofing were removed roofing material and possibly did not follow the OSHA regulations as listed below:</p> <ol style="list-style-type: none"> 1) Working occurred outside the safety barricade and in close proximity to the edge of the roof; 2) The crane operator did not have a current operators license to operate the equipment; 3) The crane did not have an annual inspection tag; 4) Asbestos mitigative controls were not performed on the roofing material; and 5) Failure to properly lockout and tagout (LOTO)the electrical energy source prior to disconnect of rooftop equipment. 		

BACKGROUND: Spectra Corporation operates a commercial isotope operation under an agreement between the Department of Energy (DOE) and Los Alamos County at TA-46-88. DOE leases the building to Los Alamos County, who in turn sub-leases it to Spectra Corporation. DOE is the principle Landlord. LANL does not currently manage maintenance or operations for this facility. Spectra Corporation hired National Roofing to repair the building's roof. The lease agreement states the "lessee shall submit to the Area Manager for approval the design document and construction drawings for the project, which shall detail the specifications for the modification or improvement . . .," and Spectra Corporation determined that the project was maintenance and not a modification or improvement; therefore, they directly contracted with the roofing company for the work. Spectra Corporation notified Los Alamos County that the work would be taking place.

Cause Description:

ISM SUMMARY

According to the LANL ISM checklist, performing work in accordance with requirements, and in compliance with necessary procedures, is part of performing work safely. Therefore, in binning this event for ISM failures, it should be reported as a failure at Step 4, Perform Work within Controls.

CAUSAL ANALYSIS

Apparent Cause Analysis and the Causal Analysis Tree as described in the DOE Occurrence Reporting Causal Analysis Guide (DOE G 231.1-2) were used to identify the cause for this event. Apparent Causes are identified as the most probable causes of an event or condition that management has the control to fix and for which effective recommendations for corrective actions can be generated.

An apparent cause of the event was the lack of a process that ensures sufficient verbal and written communication between Spectra Corporation, Los Alamos County, DOE as represented by LASO, and LANL.

Spectra Corporation contracted with National Roofing to fix a roof leak in accordance to their lease agreement with Los Alamos County. The lease agreement flow-down does not require Spectra Corporation to assume waste generator responsibilities in order to ensure the roofing company or any other company that provides maintenance services comply with applicable federal, state, and local laws and regulations, including laws and regulations pertaining to LANL.

When a LANL IHS-OS project leader observed what he thought might be worker safety issues, there was not a clear mechanism for him to report his concerns to Spectra Corporation, LASO, Los Alamos County, or National Roofing. The LANL IHS-OS project leader informed his line management of his concerns. During discussions of this event, LANL and LASO management realized that even though Spectra Corporation activities are performed within the LANL campus, the company's activities do not fall

	<p>under the purview of the LANL Facility Operation Director (FOD) responsible for the TA-46 site.</p> <p>All roofing repairs have been completed in accordance to all federal, state, and local laws and regulations, including laws and regulations pertaining to LANL.</p> <p>It should be noted that the LANL Emergency Management and Response (EM&R) team is responsible for responding to emergencies (e.g. fire) at the site and EM&R does have current contact numbers, a Building Run Sheet containing a list of building hazards, and a copy of the Building Emergency Plan. The Los Alamos County Fire department has access to a key box containing Los Alamos County key cores to gain entrance to the building in case of an emergency.</p> <p>The cause codes that best describes this event are (A5B4C01) Communication Between Work Groups Less Than Adequate and (A5B3C01) Lack of Written Communication.</p>
Operating Conditions:	Normal
Activity Category:	Maintenance
Immediate Action(s):	<ol style="list-style-type: none"> 1) Removal of the tear off work was suspended to determine if asbestos was present in the removed roofing material. 2) The roll-off bin containing the roofing material was covered to render it safe until proper disposal can be arranged. 3) LANL advised DOE to provide a courtesy notification to the New Mexico Environmental Department.
FM Evaluation:	The complex nature of the lease arrangement for this facility created confusion between LASO and LANL in communication of concerns related to this event. While LASO oversight authority is recognized for this lease, LANL must also have some mechanism to evaluate the collocated hazards within the same geographical area. A memorandum of understanding (MOU) type document will aid in understanding of lines of authority and communication.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	No
Division or Project:	LASO
Plant Area:	Roof
System/Building/Equipment:	TA-46-88
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:03/31/2008</td> <td>Actual Completion Date:</td> </tr> </table>	Target Completion Date: 03/31/2008	Actual Completion Date:
Target Completion Date: 03/31/2008	Actual Completion Date:		
	<p>Title: EM&R, LASO, and FOD Engagement</p> <p>Action Description: Facility Management and Operations (FMO-DO) division leader will coordinate a meeting between Spectra Corporation, LASO, and LANSs responsible managers to ensure that all responsible parties can communicate off-normal events or issues.</p> <p>Responsible Organization: FMO-DO</p> <p>Deliverable: Memorandum of Understanding</p>		
Lessons(s) Learned:			
HQ Keywords:	01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous) 01G--Inadequate Conduct of Operations - Inadequate Procedure 01K--Inadequate Conduct of Operations - Lockout/Tagout Noncompliance (Electrical) 01N--Inadequate Conduct of Operations - Inadequate Job Planning (Other) 01P--Inadequate Conduct of Operations - Inadequate Oral Communication 01R--Inadequate Conduct of Operations - Management issues 02D--Environmental - Compliance Notification (from or to regulator without a violation) 08C--OSHA Reportable/Industrial Hygiene - Industrial Hygiene Exposure 08F--OSHA Reportable/Industrial Hygiene - Industrial Operations Issues 08H--OSHA Reportable/Industrial Hygiene - Safety Noncompliance 11G--Other - Subcontractor 11J--Other - Tenants on DOE Property 12J--EH Categories - OS/IH 13A--Management Concerns - HQ Significant (High-lighted for Management attention) 14D--Quality Assurance - Documents and Records Deficiency 14E--Quality Assurance - Work Process Deficiency 14H--Quality Assurance - Inspection and Acceptance Testing Deficiency		
HQ Summary:	While removing roofing materials, a roofing subcontractor did not follow OSHA regulations. Roofers worked outside the safety barricade and in close proximity to the edge of the roof, and may not have worn proper fall protection. The crane operator did not have a current operator's license to operate the equipment and the crane did not have an annual inspection tag. Asbestos mitigation controls were not performed on the roofing material and an electrical source was not properly locked and tagged out. Removal of the tear off work was suspended to determine if asbestos was present in the removed roofing material.		

Similar OR Report Number:	1. NA--LASO-LANL-FIRNGHELAB-2005-0011			
Facility Manager:	Name	Ken Schindwein		
	Phone	(505) 667-9416		
	Title	Facility Management and Operation Division Leader		
Originator:	Name	TALLARICO, ANTONIA		
	Phone	(505) 665-6988		
	Title	OCCURRENCE INVESTIGATOR		
HQ OC Notification:	Date	Time	Person Notified	Organization
	NA	NA	NA	NA
Other Notifications:	Date	Time	Person Notified	Organization
	12/07/2007	15:00 (MTZ)	Micheal Kline	NNSA
	01/25/2008	17:16 (MTZ)	Ed Christie	NNSA
	01/25/2008	17:16 (MTZ)	Isaac Valdez	NNSA
Authorized Classifier(AC):	Antonia Tallarico Date: 02/15/2008			

8)Report Number:	NA--LASO-LANL-TA55-2007-0043 After 2003 Redesign			
Secretarial Office:	National Nuclear Security Administration			
Lab/Site/Org:	Los Alamos National Laboratory			
Facility Name:	Plutonium Proc & Handling Fac			
Subject/Title:	Workers Discover Uncontrolled Hazardous Energy			
Date/Time Discovered:	12/10/2007 15:59 (MTZ)			
Date/Time Categorized:	12/11/2007 11:00 (MTZ)			
Report Type:	Update			
Report Dates:	Notification	12/13/2007	17:27 (ETZ)	
	Initial Update	01/17/2008	15:46 (ETZ)	
	Latest Update	01/17/2008	15:46 (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:	2) Analyze the Hazards 3) Develop and Implement Hazard Controls
Subcontractor Involved:	Yes B&D Electrical, KSL
Occurrence Description:	<p>UPDATE (1/17/08): The due date for this report has been extended to allow for completion of the investigation, causal analysis, and corrective action development. The new due date is March 5, 2008.</p> <p>MANAGEMENT SYNOPSIS: Technical Area 55 (TA-55) is currently in the middle of a Switchgear Upgrade Project. On December 10, 2007, at approximately 1040, B&D Electrical workers were in a programmable logic control (PLC) panel in building PF-4, room 46. Upon completing that work, they moved to room 7 and began working on a cable installation task in another PLC. The task involved replacing THHN wires with cross-linked polyethylene SIS wires. The workers were in the process of identifying the number of wires that needed to be replaced when they pulled two leads and apparently, the leads contacted each other. When the leads contacted each other the lock-out relay became energized and resulted in tripping a series of circuit breakers. The workers heard the breakers trip but they were unaware that 1) the leads were energized, and 2) that the two leads had made contact. During the critique on December 11, 2007, it was identified that the hazardous energy was uncontrolled. The Facilities Operations Director (FOD) categorized this to be ORPS reportable.</p> <p>Using the Electrical Severity Tool, the LANL Electrical Safety Officer (ESO) performed the calculation with the variables described (130 volts DC, 30 amperes of current availability, dry conditions, no person was shocked). From an electrical safety standpoint this event is not considered a near miss for the following reasons: 1) No employees were shocked and 2) The voltage was under 250 volts. Therefore, there was no arc fault hazard.</p> <p>BACKGROUND: The work was covered in a pre-job briefing conducted by the back-up Person-in-Charge (PIC). The pre-job briefing was conducted in a break room with the Integrated Work Document (IWD), which included discussion on the wire change-out task. The PIC gave the IWD to the workers, who proceeded to the work area. However, the workers did not take the IWD with them into the work area. Instead, they stored the IWD in a locker. They stated two reasons for this: 1) the job was simple and involved replacing existing wire, and 2) they had difficulty obtaining Radiological Control Technician (RCT) support to survey the IWD in/out of the work area. The task being performed was not specifically identified in the IWD.</p> <p>The wire replacement task involved replacing THNN wire with SIS (cross linked polyethylene) wire. The THNN wire was newly installed, however, it was later determined that SIS is a more appropriate wire for the physical location. The workers were in the process of identifying the number of</p>

THNN wires that needed to be replaced when they pulled two leads and they contacted each other.

The project had pulled fuse blocks for control power to the switchgear, this disabled the ringbus status indication in the Operations Center as it removed power to the components that fed status to the Facility Control System. Recently two unplanned outages of the switchgear occurred. During the outages it was recognized that the loss of status hindered independent verification during power restoration, so two fuses (in a fuse block) were put back into the switchgear, thus restoring power to the sensing components. At that time, a control was implemented, but not written into the IWD that workers had to notify the TA-55 Operations Center when the fuse blocks were being removed so work could be performed on the (de-energized) switchgear. The work on December 10, 2007 was being performed in the PLC cabinet and not on the switchgear. As a result, workers did not remove the fuse blocks. They did not realize there was voltage in the PLC cabinet, as it did not have power conductors connected.

When the two leads touched, the breakers controlling the non-ventilation system loads for the North-side of PF-4 tripped in approximately 4 seconds. PF-4 hallway continuous air monitors (CAMs) remained operational, but the CAMs in the North-side lab rooms de-energized. Ventilation remained operational. Workers located in the North-side were directed to conduct an orderly exit into the hallway-area and they were eventually moved to the South-side. Zone 1 remained operational throughout the event and, as a result, the required differential pressure was maintained. During recovery, another breaker was inadvertently tripped, which caused the Zone 2 ventilation system for the North-side of PF-4 to go down. Workers were directed to conduct an orderly exit from PF-4. The facility never entered Mode 2 because they recovered from the event in a timely manner, as per the Technical Safety Requirements (TSRs).

Cause Description:	
Operating Conditions:	Normal
Activity Category:	Maintenance
Immediate Action(s):	<ol style="list-style-type: none">1. Power was recovered and ventilation returned to normal for PF-4.2. Critique was held on December 11, 2007.3. Revise the IWD to require fuses be removed and add hold points requiring independent verification/signatures.4. Require a full-time PIC5. Require a Systems Engineer be present any time the work activity changes.6. Evaluate the Switchgear Upgrade Project IWDs and identify where the workers are in terms of the task/step.7. Identify the interfaces between the Switchgear Upgrade Project IWDs. If one IWD changes, evaluate the impact on the others.

	<p>8. Identify who can operate switchgear (Support Services contractor KSL/subcontractors will no longer be allowed to operate the switchgear, without specific LANS authorization)</p> <p>9. Establish a configuration management control document log system.</p> <p>10. Require controlled IWDs and drawings to be maintained in the work area.</p> <p>11. Require refresher training for KSL and subcontractors on this project to include: IWDs, Operations Center communications, responding to abnormal conditions/stop work.</p>
FM Evaluation:	UPDATE (1/17/08): The due date for this report has been extended to allow for completion of the investigation, causal analysis, and corrective action development. The new due date is March 5, 2008.
DOE Facility Representative Input:	
DOE Program Manager Input:	
Further Evaluation is Required:	<p>Yes.</p> <p>Before Further Operation? No</p> <p>By Whom: ESH-OFF and FOD</p> <p>By When: 03/05/2008</p>
Division or Project:	TA55
Plant Area:	PF-4
System/Building/Equipment:	Switchgear Upgrade Project
Facility Function:	Plutonium Processing and Handling
Corrective Action:	
Lessons(s) Learned:	
HQ Keywords:	<p>01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous)</p> <p>01E--Inadequate Conduct of Operations - Operations Procedure Noncompliance</p> <p>01G--Inadequate Conduct of Operations - Inadequate Procedure</p> <p>01I--Inadequate Conduct of Operations - Safety System Actuation/Evacuation</p> <p>01M--Inadequate Conduct of Operations - Inadequate Job Planning (Electrical)</p> <p>01R--Inadequate Conduct of Operations - Management issues</p> <p>05C--Mechanical/Structural - Ventilation System/Fan</p> <p>07D--Electrical Systems - Electrical Wiring</p> <p>11G--Other - Subcontractor</p> <p>12C--EH Categories - Electrical Safety</p> <p>13A--Management Concerns - HQ Significant (High-lighted for Management attention)</p> <p>14D--Quality Assurance - Documents and Records Deficiency</p> <p>14E--Quality Assurance - Work Process Deficiency</p>

HQ Summary: While identifying wires that needed to be replaced by a wiring upgrade project, workers pulled two energized leads which contacted each other. When the two leads touched, several breakers tripped causing a loss of power to some of the continuous air monitors (CAMs) in building PF-4. Personnel in affected area were evacuated. During recovery, another circuit breaker tripped causing a partial loss of ventilation. Personnel in those affected areas were evacuated. A critique was held and several corrective actions were developed for work control of the rewiring project.

Similar OR Report Number: 1. NA--LASO-LANL-TA55-2007-0039

Facility Manager:	Name	Stuart McKernan
	Phone	(505) 667-7501
	Title	Facility Operations Director Designee

Originator:	Name	VOSS, SUSAN J
	Phone	(505) 667-5979
	Title	OCCURRENCE INVESTIGATOR

HQ OC Notification:	Date	Time	Person Notified	Organization
	NA	NA	NA	NA

Other Notifications:	Date	Time	Person Notified	Organization
	12/11/2007	08:23 (MTZ)	Tom McNaughton	ESO
	12/11/2007	08:23 (MTZ)	Audrey Hayes	PAAA

Authorized Classifier(AC): Susan J. Voss Date: 01/17/2008

9)Report Number: [NA--SRSO-WSRC-TRIT-2007-0010](#) After 2003 Redesign

Secretarial Office: National Nuclear Security Administration

Lab/Site/Org: Savannah River Site

Facility Name: Tritium Facilities

Subject/Title: Inadvertent Lifting of Energized 110 Volt Conductor

Date/Time Discovered: 12/10/2007 10:10 (ETZ)

Date/Time Categorized: 12/11/2007 16:45 (ETZ)

Report Type: Final

Report Dates:	Notification	12/12/2007	09:27 (ETZ)
	Initial Update	01/25/2008	08:22 (ETZ)
	Latest Update	02/08/2008	13:41 (ETZ)
	Final	02/08/2008	13:41 (ETZ)
	Revision 1	02/08/2008	14:02 (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:	A5B2C04 - Communications Less Than Adequate (LTA); Written Communication Content LTA; Equipment identification LTA A5B2C05 - Communications Less Than Adequate (LTA); Written Communication Content LTA; Ambiguous instructions / requirements A6B1C02 - Training deficiency; No Training Provided; Training requirements not identified A3B3C05 - Human Performance Less Than Adequate (LTA); Knowledge Based Error; Incorrect assumption that a correlation exists between two or more facts -->couplet - A5B1C04 - Communications Less Than Adequate (LTA); Written Communication Method of Presentation LTA; Deficiencies in user aids (charts, etc.) A1B5C02 - Design/Engineering Problem; Operability of Design / Environment LTA; Physical environment LTA
ISM:	2) Analyze the Hazards
Subcontractor Involved:	No
Occurrence Description:	<p>A Tritium Maintenance Organization (TMO) E&I mechanic inadvertently lifted an energized 110 volt conductor from an instrument terminal strip on the back of a Panametrics display. The mechanic was performing a Deuterium monitor calibration which required the lifting of an energized 24 volt conductor from the back of the same Panametrics display, but on a different terminal strip. The job was placed in a safe condition and all further work on this instrument has been stopped pending an investigation. The mechanic involved was wearing the proper Personal Protective Equipment (PPE), therefore, there was no impact to the safety of personnel. The summary below follows the completion of a critique and subsequent investigation.</p> <p>INVESTIGATIVE SUMMARY: On 12/10/07, H-Area New Manufacturing (HANM) was in a normal operations mode. According to the troubleshooting procedure Work Package (WO #00826243-01, T/S & Repair FTS-D2 Monitor) dated Friday 12/7/07, the D2 monitor was in alarm. Two qualified electrical workers (QEW, hereafter referred to as "electricians") were assigned to perform troubleshooting/ repair on the FTS-D2 Monitor. The electricians reviewed the approved trouble shooting Work Package and discussed the job with the First Line Manager (FLM), the FLM and electricians agreed that they would perform a loop check first using Preventative Maintenance (PM) Work Package WO # 00807759-01 (Ref 9) in order to localize the failure. After</p>

receiving approval from the Shift Operations Manager (SOM), they gained access to the instrument which was recessed approximately 2 feet into a wall in the hallway behind room 32. Based on the procedure and attached drawing, they lifted what they believed to be a 24 volts dc (VDC) D2 signal wire from its terminal on the instrument in order to attach their test equipment. As the wire was lifted, the lifting electrician (A) noted a small unexpected arc. Several alarms tripped immediately, and appropriate personnel responded to the area. The situation was evaluated by the SOM, and they made a decision to reland the lifted lead back to its original terminal.

Instead of lifting the required 24 VDC lead from an input terminal block, electrician A had lifted a 120 VAC lead from an output terminal block on the same instrument. Immediate actions were taken to return to a safe condition. A thorough critique was conducted on 12/11/07. It evaluated the event for the actions and conditions that led to the incident, reviewed the immediate actions for adequacy and developed a set of corrective actions. Troubleshooting the D2 monitor was reinitiated and completed on 12/15/07. However, for electrical events that are reportable to DOE in the Occurrence Reporting and Processing System (ORPS) an Apollo root cause analysis is required per Procedure Manual 9B, 1-0, Site Item Reportability and Issue Management (SIRIM). Therefore, a team of subject matter experts and cognizant personnel lead by an Apollo root cause analysis facilitator met to perform an Apollo analysis. The Team agreed on the "primary effect," and completed the problem definition. At the completion of the cause and effect charting, the Team reviewed the corrective actions that were developed during a critique. Those corrective actions which would prevent recurrence of the individual causes were selected as primary corrective actions. Although the remaining corrective actions would not prevent this event, they were evaluated and submitted for implementation as well.

EXTENSION UPDATE: On 01/23/2008, the NNSA FR Edwin Deshong agreed to extend the due date of this report from 01/25/2008 to 02/08/2007 (14 days). The justification for requesting this extension is due to the time needed to complete, review and approve the Apollo Root Cause Analysis (RCA) Report. This request also includes the time needed to finalize the ORPS Report once the Apollo RCA has been approved. The need to further expound on the complex details in the report and the corrective actions was recognized and require additional time.

Cause Description:

ROOT CAUSE(S):
A5B2CO4 - Communication LTA / Written Communication Content LTA / Equipment identification LTA
a. Electrician A was misled by procedure
- Procedure sketch did not match field layout
- Procedure adequate only for personnel familiar with equipment

- procedure sketch did not identify terminal block
- (procedure sketch) lacked detail

A5B2CO5 - Communication LTA / Written Communication Content LTA / Ambiguous Instructions/Requirements

- b. Electrician did not read voltage prior to lifting lead
 - Electrician believed terminal blocks not at 120 VAC
 - Believed test not required for 24 volts
 - Panametrics alarm circuits were believed to be 24 volts
 - Procedure T-782514 did not require voltage measurement
- c. Electrician did not read voltage prior to lifting lead
 - Work package did not require voltage measurement
 - Believed test not required for 24 volts
 - Normal practice for Panametrics terminals.

A6B1C02 - Training Deficiency / No Training provided / Training requirements not identified

- d. Electrician did not read voltage prior to lifting lead
 - JPM did not cover
 - Did not realize 120 VAC on alarm circuit
 - Believed test not required for 24 volts

CONTRIBUTING CAUSE(S):

A5B2CO5 - Communication LTA / Written Communication Content LTA / Ambiguous Instructions/Requirements

- 1o: Electrician did not read voltage prior to lift
 - Work Package (WP) did not require voltage measurement
- 2o: Electrician did not read voltage prior to lift
 - WP did not require voltage measurement
 - 18Q 2 Table 1, Note B1 ambiguous
 - 18Q 2 Table 1 Tester box not checked

A5B2CO4 - Communication LTA / Written Communication Content LTA / Equipment identification LTA

- 5o: Electrician A misled by procedure
 - Adequate only for personnel familiar with equipment
 - Procedure sketch did not identify terminal block
 - Procedure sketch lacked detail
 - Procedure did not advise of 120 VAC on terminal blocks
- 7o: Procedure sketch did not match field layout

A3B3C05 - Human Performance LTA / Knowledge based error / Incorrect assumption that a correlation existed between two or more facts

- 5o: Electrician A misled by procedure
 - Adequate only for personnel familiar with equipment
 - Procedure sketch not identify terminal block

	<ul style="list-style-type: none"> - Procedure sketch lacked detail - Procedure did not advise of 120 VAC on terminal blocks <p>A1B5C02 - Design/Engineering problem / Operability of design/environment LTA / Physical environment LTA 9o: Test connection not available</p> <ul style="list-style-type: none"> - Original Panametrics design did not have removal strips <p>11o: Test connection not available</p> <ul style="list-style-type: none"> - Original Panametrics design did not have removal strips <p>No other means to separate</p> <ul style="list-style-type: none"> - Not identified as design requirement <p>A6B1C02 - Training Deficiency / No training provided / Training requirements</p> <p>10o: Believed test not required for 24 volts</p> <ul style="list-style-type: none"> - Not aware of intent Note B1, Table 1, 18Q 2 - Site Training on 18Q Proc 2 did not cover specifics for measuring circuits < 50 volts. 	
Operating Conditions:	Normal process operations within the facility were ongoing.	
Activity Category:	Maintenance	
Immediate Action(s):	<ol style="list-style-type: none"> 1. Entered LCO 3.4.1 when alarms were received 2. Responded to alarms (CCR and room 32 RSO) 3. Re-Landed Lead 4. Discontinued work on FTS-D2 5. Generated SS troubleshooting package for FTS-O2 and re-performed daily surveillance 6. Requested Engineering to investigate. 	
FM Evaluation:	Any future activities involving work on electrical systems (e.g., including low voltage / less than 50 volts systems) will require a voltage measurement of the conductors prior to starting work.	
DOE Facility Representative Input:		
DOE Program Manager Input:		
Further Evaluation is Required:	No	
Division or Project:	SR - WSRC - TRIT	
Plant Area:	H-Area / Tritium	
System/Building/Equipment:	FTS D2 / H-Area New Manufacturing (HANM) / Monitoring	
Facility Function:	Tritium Activities	
Corrective Action 01:	Target Completion Date: 12/18/2007	Tracking ID: 2007-CTS-015005, 004
	Generate IPC for procedure PP T-782514 to provide specific guidance so the correct lead would be lifted. (PAAA commitment date is 2/14/2008)	

Corrective Action 02:	Target Completion Date: 03/31/2008	Tracking ID: 2007-CTS-015005, 005
	Review procedure and revise appropriately.	
Corrective Action 03:	Target Completion Date: 12/11/2007	Tracking ID: 2007-CTS-015005, 006
	Issue shift order that direct mechanics to perform voltage measurement prior to start of work on 50 volts or less. (PAAA commitment date is 2/14/2008)	
Corrective Action 04:	Target Completion Date: 12/21/2007	Tracking ID: 2007-CTS-015005, 007
	Provide briefing to Tritium Maintenance Organization Electricians on measuring voltage prior to start of work on 50 volts or less.	
Corrective Action 05:	Target Completion Date: 08/31/2008	Tracking ID: 2007-CTS-015005, 008
	Submit proposed revision to 18 Q, Procedure 2 to the SERB to clarify the requirement for measuring voltage when working on 50 volts or less and request the SERB provide interim guidance to electrical workers sitewide.	
Corrective Action 06:	Target Completion Date: 12/18/2007	Tracking ID: 2007-CTS-015005, 009
	Clarify measuring voltage requirements when working on 50 volts or less.	
Corrective Action 07:	Target Completion Date: 03/31/2008	Tracking ID: 2007-CTS-015005, 010
	Submit lessons learned to the site for this event.-STAR	
Corrective Action 08:	Target Completion Date: 12/18/2007	Tracking ID: 2007-CTS-015005, 011
	Place Job Performance Measure (JPM) for this task on hold.	
Corrective Action 09:	Target Completion Date: 03/31/2008	Tracking ID: 2007-CTS-015005, 012
	Revise JPM for this task. Incorporate different designs into JPM to include 120 VAC alarm circuit on SAS/FTS. (PAAA Commitment date is 5/1/2008)	
Corrective Action 10:	Target Completion Date: 03/31/2008	Tracking ID: 2007-CTS-015005, 013
	Incorporate the different monitor design configurations into procedure.	
Corrective Action 11:	Target Completion Date: 03/31/2008	Tracking ID: 2007-CTS-015005, 014
	Develop Human Performance case study.	
Corrective Action 12:	Target Completion	Tracking ID: 2007-CTS-015005,

	Date: 03/31/2008	015
	Evaluate field labeling versus procedure revision for instruments covered by proc PP T-782514.	
Corrective Action 13:	Target Completion Date: 12/30/2008	Tracking ID: 2007-CTS-015005, 016
	Perform an Effectiveness Review within 180-calendar days (6 months) of the closure of the last corrective action identified for preventing recurrence in accordance with the requirements of MP 5.35.	
Corrective Action 14:	Target Completion Date: 04/30/2008	Tracking ID: 2007-CTS-015005, 017
	Evaluate with input from AHA Sponsors ?desired conditions? relative to the Hazard Analysis as identified during the Apollo (e.g., during IPC roll-up, periodic reviews and SRRs).	
Corrective Action 15:	Target Completion Date: 06/27/2008	Tracking ID: 2007-CTS-015005, 018
	Evaluate alternative methods to disconnect electrical leads that are routinely lifted.	
Corrective Action 16:	Target Completion Date: 02/18/2008	Tracking ID: 2007-CTS-015005, 019
	Submit request to SERB for Site Training to more explicitly train on voltage measurements required below 50v.	
Corrective Action 17:	Target Completion Date: 02/18/2008	Tracking ID: 2007-CTS-015005, 020
	Submit request to Electrical Technical Committee (ETC) to evaluate alternative methods to disconnect electrical leads that are routinely lifted.	
Corrective Action 18:	Target Completion Date: 04/30/2008	Tracking ID: 2007-CTS-015005, 021
	Revise procedure T-782518 to include a detailed drawing of the instrument and terminal blocks similar to that included in the revision to T-782514.	
Lessons(s) Learned:	Prior to the performance of electrical work, regardless of voltage levels, measurements must be made of the exposed conductors and terminals being worked on and those that are within proximity as required per 18Q, Procedure 2.	
HQ Keywords:	01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous) 01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control 01G--Inadequate Conduct of Operations - Inadequate Procedure 01Q--Inadequate Conduct of Operations - Personnel error	

	12C--EH Categories - Electrical Safety 14D--Quality Assurance - Documents and Records Deficiency 14E--Quality Assurance - Work Process Deficiency																								
HQ Summary:	While performing a deuterium monitor calibration, a mechanic inadvertently lifted an energized 110-volt conductor from an instrument terminal strip on the back of a Panametrics display instead of a 24-volt conductor on an adjacent terminal strip. The job was placed in a safe condition and all further work on this instrument has been stopped pending corrective actions. A critique was held.																								
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Originator:	<table border="1"> <tr> <td>Name</td> <td>HALL, WILLIAM R</td> </tr> <tr> <td>Phone</td> <td>(803) 208-8558</td> </tr> <tr> <td>Title</td> <td>PRINCIPLE ENGINEER & TECHNICAL SUPPO</td> </tr> </table>	Name	HALL, WILLIAM R	Phone	(803) 208-8558	Title	PRINCIPLE ENGINEER & TECHNICAL SUPPO																		
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Authorized Classifier(AC):	Moore, Marlene L. Date: 02/08/2008																								

10)Report Number:	NA--SS-SNL-CASITE-2007-0010 After 2003 Redesign		
Secretarial Office:	National Nuclear Security Administration		
Lab/Site/Org:	Sandia National Laboratories - Livermore		
Facility Name:	SNL California Site		
Subject/Title:	Electrical Incident Involving Sheetrock Subcontractor		
Date/Time Discovered:	12/10/2007 11:30 (PTZ)		
Date/Time Categorized:	12/10/2007 12:10 (PTZ)		
Report Type:	Final		
Report Dates:	Notification	12/11/2007	17:50 (ETZ)
	Initial Update	12/20/2007	11:46 (ETZ)

	Latest Update	01/16/2008	18:51 (ETZ)
	Final	01/16/2008	18:51 (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:	A3B2C02 - Human Performance Less Than Adequate (LTA); Rule Based Error; Signs to stop were ignored and step performed incorrectly -->couplet - A4B3C08 - Management Problem; Work Organization & Planning LTA; Job scoping did not identify special circumstances and/or conditions		
ISM:	2) Analyze the Hazards		
Subcontractor Involved:	Yes Taylor Drywall		
Occurrence Description:	<p>On December 10, 2006 at approximately 10:15 a.m. a sheetrock subcontractor caused and witnessed an electrical short circuit that resulted in an electrical arc and tripped a 120V circuit breaker. The sheetrock subcontractor was working on a room renovation project in Building 910, Room 121. The subcontractor was standing atop a scissor lift with both hands above the head to position and install a small section of sheetrock (in a tight area) when the subcontractor's stomach accidentally pushed against an existing half inch (thin wall) conduit containing energized 120V conductors. This resulted in the conduit separating from the compression fitting and cutting into the insulated wires (conductors) causing the short circuit and tripping the circuit breaker.</p> <p>The sheetrock subcontractor was unaware that the circuit was energized. Immediately after witnessing the electrical short, the subcontractor came down from the scissor lift and informed the security escorts and the general subcontractor electrician.</p> <p>The subcontractor electrician checked the wires for voltage, with no voltage measured, the wires were disconnected and capped at an upstream junction box west of the room. The Superintendent for the General Contractor was notified of the incident, and in turn notified the Sandia Project Engineer.</p> <p>Shortly thereafter, the Subcontractor was medically evaluated by a personal physician and further reported that no injury had been detected.</p>		
Cause Description:	A3B2C02 - Signs to stop were ignored and step performed incorrectly		

Most activities generate indication of status [both positive and negative]. The human tendency is to focus on the indications of success rather than all the indicators. The negative indicators are the "signs to stop." "Signs" are not necessarily physical

It was determined the electrical short was initiated by the sheetrock contractor who did not recognize the potential hazard that had developed during the installation of a piece of sheetrock in a tight corner approximately 10 feet above the floor.

The contractor had inadvertently dislodged an existing half inch (thin wall) conduit containing energized 120V conductors from a junction box when the contractor's stomach came in contact with the conduit. The conduit separated from the compression fitting exposing live insulated wires (conductors), which were cut by the sharp edges of the conduit and eventually resulted in an electrical short tripping the circuit breaker.

The sheetrock subcontractor did not adequately assess the work area for possible hazards or was unaware the conduit contained energized conductors. The work was done in a tight elevated area, requiring the contractor to reach above with both hands holding a piece of sheetrock, and over the existing conduit. This created a situation in which the conduit containing energized conductors was in the way of the work, and could be damaged.

A4B3C08 - Job scoping did not identify special circumstances and/or conditions

The circuit involved in this incident operated at 120V and applied power to the Emergency Power Circuit for a security alarm system and needed to remain to utilize existing branch circuits; however, the circuit could have been de-energized temporarily during the sheetrock installation project.

The work scoping process was not effective in detecting work process elements having a dependency upon other circumstances or conditions.

It was determined that the daily "Subcontractor Pre-Task Hazard Analysis Worksheet" was not inclusive of all possible electrical hazards involved in this specific task. Though electrical shocks were identified from use of a drill, the worksheet identification of electrical hazards, from conduit containing energized conductors for the Emergency security alarm system, was less than adequate.

It was determined that a Preliminary Hazard Assessment (PHA) was completed for this project, however, it was not included with the original project package for the general contractor, i.e., it was missing and a blank

	PHA was included in the package instead.		
	Critique/Fact Finding Performed: 12/10/07		
Operating Conditions:	Normal		
Activity Category:	Construction		
Immediate Action(s):	<ul style="list-style-type: none"> *Contract electrician on the project immediately capped home run wires and LOTO was done on circuit breaker. *Subcontractor went to a private physician per SNL's request. *Work was paused for a safety review. *A safety meeting was held right after lunch to discuss the situation with all workers on the job. *The construction area was surveyed and flags were added to all other conduits containing energized conductors within the project. 		
FM Evaluation:	<p>DOE/SSO Early Notification DOE Duty Officer - Roy Lybarger - 1220PST FR - Wayne Walker 12/10/07-1320PST EOC 12/10/07 - 1107PST - # 4564 Executive Notifications written - 1406PST Prompt Notification e-mail DOE HQ OC 1406PST - verbal verification - 1410PST to Operation Center Watch Officer - 1410PST UPDATE - 12/19/2007 -</p> <p>The current understanding of the incident based on interviews and investigation no longer fits the original categorization of Significance Category 2 (SC2) - Hazardous Energy Control. As a result of the latest information gathered from the investigation process, this Occurrence Report is being downgraded to a Significance Category 3 (SC3) - Management Concerns. The title has been changed to "Electrical Incident Involving Sheetrock Subcontractor". These changes accurately reflect the facts in this occurrence.</p> <p>End of Update 12/19/2007</p>		
DOE Facility Representative Input:			
DOE Program Manager Input:			
Further Evaluation is Required:	No		
Division or Project:	8000		
Plant Area:	B910, R121		
System/Building/Equipment:	B910, R121		
Facility Function:	Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)		
Corrective Action 01:	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">Target Completion Date:03/31/2008</td> <td style="width: 50%;">Actual Completion Date:</td> </tr> </table>	Target Completion Date: 03/31/2008	Actual Completion Date:
Target Completion Date: 03/31/2008	Actual Completion Date:		

	Department 8518 will initiate a Lessons Learned (internal and external) to address the issues exemplified in this incident, i.e. the identification of any potential hidden hazards that may be present in the work area.															
Corrective Action 02:	Target Completion Date: 01/31/2008		Actual Completion Date: 01/31/2008													
	Department 8512 will ensure the “Subcontractor Pre-Task Hazard Analysis Worksheet” is updated to address electrical hazards associated with live conduits, and any other potential hidden hazards specific to this activity															
Lessons(s) Learned:																
HQ Keywords:	01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous) 01N--Inadequate Conduct of Operations - Inadequate Job Planning (Other) 01Q--Inadequate Conduct of Operations - Personnel error 07D--Electrical Systems - Electrical Wiring 08A--OSHA Reportable/Industrial Hygiene - Electrical Shock 08D--OSHA Reportable/Industrial Hygiene - Injury 08J--OSHA Reportable/Industrial Hygiene - Near Miss (Electrical) 11G--Other - Subcontractor 12C--EH Categories - Electrical Safety 13A--Management Concerns - HQ Significant (High-lighted for Management attention) 14E--Quality Assurance - Work Process Deficiency															
HQ Summary:	A sheet rock contractor standing on a scissors lift pushed against an electrical conduit and received a minor electrical shock when the conduit severed and damaged electrical wires from a junction box. The contractor felt a tingling sensation and received a slight burn mark on one of the fingers of the left hand. There were scorch marks on both the junction box and the end of the conduit. The circuit breaker tripped as intended, and the circuit was subsequently locked and tagged out. The affected circuit was 120-volt service to the Emergency Power Circuit for a security alarm system. The subcontractor went to a private physician at the Laboratory’s request.															
Similar OR Report Number:	1. NA--SS-SNL-NMFAC-2007-0013 2. NA--SS-SNL-NMFAC-2007-0014															
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td colspan="3">Jill Hruby</td> </tr> <tr> <td>Phone</td> <td colspan="3">(925) 294-2596</td> </tr> <tr> <td>Title</td> <td colspan="3">Director</td> </tr> </table>				Name	Jill Hruby			Phone	(925) 294-2596			Title	Director		
Name	Jill Hruby															
Phone	(925) 294-2596															
Title	Director															
Originator:	<table border="1"> <tr> <td>Name</td> <td colspan="3">CRIPPEN, TERRI L</td> </tr> <tr> <td>Phone</td> <td colspan="3">(925) 294-3675</td> </tr> <tr> <td>Title</td> <td colspan="3">OCCURRENCE MANAGEMENT REPRESENTATIVE</td> </tr> </table>				Name	CRIPPEN, TERRI L			Phone	(925) 294-3675			Title	OCCURRENCE MANAGEMENT REPRESENTATIVE		
Name	CRIPPEN, TERRI L															
Phone	(925) 294-3675															
Title	OCCURRENCE MANAGEMENT REPRESENTATIVE															
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													

	12/10/2007	14:06 (PTZ)	Steve Bailey	DOE HQ
Other Notifications:	Date	Time	Person Notified	Organization
	12/10/2007	11:30 (PTZ)	Herman Armijo	8517
	12/10/2007	11:30 (PTZ)	Terri Crippen	8518
	12/10/2007	11:30 (PTZ)	Bernie Bernal	8518
	12/10/2007	11:50 (PTZ)	John Garcia	8512
	12/10/2007	12:10 (PTZ)	Jill Hruby	8100
	12/10/2007	12:20 (PTZ)	Roy Lybarger	DOE Duty
	12/10/2007	12:55 (PTZ)	Pat Smith	8500
	12/10/2007	13:00 (PTZ)	Paul Hommert	8000
	12/10/2007	13:20 (PTZ)	Wayne Walker	DOE FR
	12/10/2007	14:06 (PTZ)	Bob Brandhuber	04110
	12/10/2007	14:06 (PTZ)	Peter Davies	12100
	12/10/2007	14:06 (PTZ)	Stephen Ward	04004
	12/10/2007	14:06 (PTZ)	Bruce Fetzer	03600
	12/10/2007	12:20 (PTZ)	Ed Cull	8510
	12/10/2007	12:40 (PTZ)	Angelina Sandoval	8518
	12/10/2007	14:06 (PTZ)	Philip Newman	04104
Authorized Classifier(AC):	Jeff Irwin Date: 01/15/2008			

11)Report Number:	SC--ASO-ANLE-ANLEFMS-2007-0013 After 2003 Redesign		
Secretarial Office:	Science		
Lab/Site/Org:	Argonne National Laboratory East		
Facility Name:	Facility Management Services		
Subject/Title:	Conduit with 110 Volt Energized Conductors Cut During Concrete Coring Operation Through Floor		
Date/Time Discovered:	12/18/2007 13:40 (CTZ)		
Date/Time Categorized:	12/18/2007 13:50 (CTZ)		
Report Type:	Final		
Report Dates:	Notification	12/20/2007	17:20 (ETZ)
	Initial Update	02/01/2008	16:56 (ETZ)
	Latest Update	02/01/2008	16:57 (ETZ)
	Final	02/01/2008	16:57 (ETZ)
	Revision 1	02/29/2008	17:44 (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:	A1B3C01 - Design/Engineering Problem; Design / documentation LTA; Design/documentation not complete A4B2C06 - Management Problem; Resource Management LTA; Means not provided to assure procedures / documents / records were of adequate quality and up-to-date
ISM:	2) Analyze the Hazards
Subcontractor Involved:	Yes Dynamic Electric & Core-vette Coring
Occurrence Description:	On 12/18/2007, two Argonne subcontractors were assigned to a project that involved the upgrade of a secondary chilled water pump in Bldg 364. The upgrade involved the coring of a 4-inch hole and two 1-1/2-inch holes through the 14-inch thick concrete floor slab on the first floor down into the service floor in order to run new conduit for the installation of wiring for a Variable Frequency Driver (VFD) and a disconnect on the service floor wall to serve a 350 horsepower chilled water pump. The operation involved one subcontractor employee performing the coring on the first floor with another subcontractor employee catching the core slug in a bucket while on a manlift on the service floor. Following the coring of the 4-inch hole, the subcontractor employee who caught the core slug immediately proceeded to the first floor level to inform the other subcontractor employee that he cored through a 3/4-inch thick-walled electrical conduit. Work was stopped and the Argonne project specialist was immediately contacted by the subcontractors. The project specialist initiated a 911 call. Neither subcontractor employee received an electrical shock or sustained injury.
Cause Description:	The cause of this incident involved the penetration of an energized 110 volt conduit during floor coring operations. Although the subcontractors involved in the coring process utilized all the prescribed personal protective equipment (PPE) and safety protocols, the identification of an electrical conduit was not apparent due to incomplete forty plus year old as-built drawings that did not specify a conduit in the location that was cored. Based on the fact the conduit was buried within the poured concrete slab, it is reasonable to conclude it was placed during initial construction. Because it did not appear on the design drawings, it is also reasonable to conclude the adequate means were not available for whatever reason to assure the change of adding this conduit serving several wall receptacles was incorporated into project drawings.
Operating Conditions:	Indoors; ambient light and temperatures;
Activity Category:	Construction

Immediate Action(s):

The work was stopped when the subcontractor noted the core contained a severed 3/4-inch conduit containing conductors. The circuit was located and identified as an energized 110 volt circuit serving four unused duplex receptacles on the service floor. The breaker was found in the interrupted position indicating it had opened the circuit. The circuit was then immediately locked-out/tagged-out by both building maintenance personnel and the subcontractors and a voltage verification was performed. After verifying that all safety barriers were again in place and the proper notifications were performed, the project specialist authorized work to resume on the coring of the two remaining holes.

FM Evaluation:

Similar instances have occurred here and within the DOE Complex in the past. Because of information sharing within the complex through such mechanisms as Lessons-Learned and EFCOG's, numerous barriers to the prevention of serious injury are now routinely employed including the use of appropriate electrical gear for the coring machine operator. Paragraph 9.3.9 "Excavations and Penetrations" of the ES&H Manual specifically requires that project planners, supervisors, and workers consider electrical hazards when performing...penetrations. "Electrical hazards must be evaluated for the specific task and proper precautions, including PPE, must be followed when performing this work. The procedures, specified in the...Coring Checklist forms must be followed." Those barriers as denoted in the Checklist were in place. This includes evaluating the design drawings, the reference drawings, wearing voltage-rated gloves, visually evaluating the coring area and surroundings, utilizing a GFCI (to protect the operator in event of coring machine electrical malfunctions) and completing the Coring Checklist. These precautions were completed because of the expectation of encountering potentially energized electrical conductors.

The discovery of this incident, the willingness of the subcontractors to report their findings and the project personnel to communicate the result can be considered a success to learning and implementing the lessons of the past to assure a no injury incident.

We will use this as yet another opportunity to review the barriers and determine if additional methods can be employed to further protect in similar situations. There was some discussion about the usefulness of a ground penetrating radar instrument available in another department of FMS as to its capability with a 14-inch concrete floor as is the case here. The unit is advertised to have capability to 12-inches so there is some concern about its ability with this flooring system. These type units can be difficult to read and understand so users are cautioned against considering them to be totally accurate in all cases.

UPDATE FINAL: On December 19, 2007, the FMS Facility Manager issued a moratorium for FMS construction projects and directed the FMS construction safety group to reevaluate the concrete coring process.

	<p>The coring process was evaluated. Survey meters were evaluated and it was determined that other DOE contractors along with Argonne have conducted tests and inspections upon numerous types of instruments that may have some capability of determining energized conductors within conduit within concrete slabs. Frequently mentioned issues include limited depth of readings, clarity and discrimination of readouts on monitoring screens, operator skill and experience in evaluating the readouts, and concern over a potential false sense of security in acceptance of the data.</p> <p>Additionally, it was determined that two more barriers could be employed to further assure operator safety. The coring checklist and the job safety analysis were modified to incorporate that either electrically non-conductive (minimum 1000 volt) rated mat or Electrical Hazard-rated (minimum 1000 volt) over boots for the operator will be utilized.</p> <p>With the implementation of additional barrier protection, the moratorium was lifted by the FMS Facility Manager on 01/09/2008.</p>			
DOE Facility Representative Input:				
DOE Program Manager Input:				
Further Evaluation is Required:	No			
Division or Project:	Facilities Management & Services Division			
Plant Area:	360 Area			
System/Building/Equipment:	Electrical/Bldg. 364/Coring machine			
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:02/29/2008</td> <td>Actual Completion Date:02/28/2008</td> </tr> </table>	Target Completion Date: 02/29/2008	Actual Completion Date: 02/28/2008	
Target Completion Date: 02/29/2008	Actual Completion Date: 02/28/2008			
	FMS Engineering will update the existing Building 364 drawing containing the severed conduit to specify its location based upon the location it was contacted.			
Corrective Action 02:	<table border="1"> <tr> <td>Target Completion Date:01/09/2008</td> <td>Actual Completion Date:01/09/2008</td> </tr> </table>	Target Completion Date: 01/09/2008	Actual Completion Date: 01/09/2008	
Target Completion Date: 01/09/2008	Actual Completion Date: 01/09/2008			
	Evaluate concrete coring checklist and job safety analysis to determine need to include further protective barriers that could be incorporated to assure safe operation.			
Corrective Action 03:	<table border="1"> <tr> <td>Target Completion Date:04/15/2008</td> <td>Actual Completion Date:</td> </tr> </table>	Target Completion Date: 04/15/2008	Actual Completion Date:	
Target Completion Date: 04/15/2008	Actual Completion Date:			
	Qualified worker to remove the receptacle and wire feeding the outlet, install a blank cover plate with a label stating "Not to be used".			

Corrective Action 04:	Target Completion Date: 04/15/2008 Actual Completion Date:								
	Update the Building 364 drawing to indicate conduit in flooring and outlet removed.								
Lessons(s) Learned:	<p>Although no injury resulted from this incident, FMS took this opportunity to further evaluate the protective measures that are currently in place for operators of coring activities. This incident strengthened the belief that one can not simply rely on old design drawings and as-builts as an accurate representation of current conditions.</p> <p>Additionally, although not a factor in this event, attempting to accurately field locate components such as a 1-inch diameter conduit, from small scale design drawings or as-builts, may be difficult at best. A variance of a small dimension such one-sixteenth of an inch may result in a field location difference of several inches.</p>								
HQ Keywords:	01B--Inadequate Conduct of Operations - Loss of Configuration Management/Control 01N--Inadequate Conduct of Operations - Inadequate Job Planning (Other) 07D--Electrical Systems - Electrical Wiring 11G--Other - Subcontractor 12C--EH Categories - Electrical Safety 14D--Quality Assurance - Documents and Records Deficiency 14E--Quality Assurance - Work Process Deficiency								
HQ Summary:	Two Argonne subcontractors were coring a 4-inch hole and two 1½ -inch holes through a 14-inch thick concrete floor slab on the first floor down into the service floor in order to run new conduit for a Variable Frequency Driver for chilled water pump, when they cored through an electrical conduit. Work was stopped and the Argonne project specialist was immediately contacted by the subcontractors. The circuit was found tripped and was immediately locked-out/tagged-out. Neither subcontractor employee received an electrical shock or sustained injury.								
Similar OR Report Number:	1. SC-CH-AA-ANLE-ANLEFMS-2005-0003 2. SC-CH-AA-ANLE-ANLEFMS-2002-0002								
Facility Manager:	<table border="1"> <tr> <td>Name</td> <td>G. Y. Stine</td> </tr> <tr> <td>Phone</td> <td>(630) 252-8930</td> </tr> <tr> <td>Title</td> <td>Director, Facilities Management & Services Div.</td> </tr> </table>	Name	G. Y. Stine	Phone	(630) 252-8930	Title	Director, Facilities Management & Services Div.		
Name	G. Y. Stine								
Phone	(630) 252-8930								
Title	Director, Facilities Management & Services Div.								
Originator:	<table border="1"> <tr> <td>Name</td> <td>BRINDLE, SUSAN K</td> </tr> <tr> <td>Phone</td> <td>(630) 252-6286</td> </tr> <tr> <td>Title</td> <td>ORPS COORDINATOR</td> </tr> </table>	Name	BRINDLE, SUSAN K	Phone	(630) 252-6286	Title	ORPS COORDINATOR		
Name	BRINDLE, SUSAN K								
Phone	(630) 252-6286								
Title	ORPS COORDINATOR								
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:	Date	Time	Person Notified	Organization
	12/18/2007	13:50 (CTZ)	R. McCook	ANL-EQO
	12/18/2007	14:00 (CTZ)	S. Brindle	ANL-EQO
	12/18/2007	14:15 (CTZ)	C. Schumann	DOE-ASO
	12/18/2007	14:45 (CTZ)	G. Stine	ANL-FMS
Authorized Classifier(AC):	Glen Bode		Date: 12/20/2007	

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