Lawrence Berkeley National Laboratory
Occurrence Reporting and Processing System (ORPS)

Performance Analysis and Identification of Recurring Occurrences (October 1, 2003 to September 30, 2004) Report No. 4

Office of Assessment and Assurance
Environment, Health and Safety Division
December 2004

LBNL ORPS Performance Analysis and Identification of Recurring Occurrences
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Executive Summary of Analysis Results

The ORPS performance analysis was conducted of all ORPS and/or PAAA events occurring from October 1, 2003 to September 30, 2004. Using the guidance provided in DOE G 231.1-1, *Occurrence Reporting and Performance Analysis Guide*, and DOE G 231.1-2, *Occurrence Reporting Causal Analysis Guide*, data elements and groupings were identified for each LBNL occurrence during this time period. The analysis addressed who was involved, what happened, where/when did it happen, and how did it happen to determine the major contributors for any given event. Based on this analysis, there was no statistical evidence that LBNL had any recurring events that warrant additional management action or the submission of an ORPS Category 2R report.

Background

This ORPS performance analysis is part of the quarterly analysis and trending requirements mandated by DOE O 231.1A, *Environment, Safety, and Health Reporting*, and DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information*. The goal of the analysis is to determine if there are recurring events that need to be addressed collectively in order to preclude these types of events from occurring in the future. LBNL reviewed its events that occurred during the past 12 months (October 1, 2003 to September 30, 2004). The events included six ORPS-reportable occurrences and five non-ORPS occurrences identified in the Price Anderson Amendment Act Noncompliance Tracking System (PAAA/NTS). Per the DOE guidance, each of the eleven events were broken down into data elements and element groupings to address who was involved, what happened, where/when did it happen, and how did it happen (see Attachment 1).

Analysis

A Pareto Analysis was conducted of the data elements to identify major contributors to the LBNL occurrences (see Attachment 2). Most of the data elements recurred infrequently for the eleven analyzed events. In order to be statistically significant, a data element should have at least five (5) data points before a trend can be established (ref: TapRoot® performance trending training). Less Than Adequate (LTA) Developed/Implemented Controls from the [ISM function] data element was the only contributor that were statistically significant during the past year (i.e., LTA controls were involved in occurrences more than five times [5x]). To determine any repetitive patterns or trends, LTA Developed/Implemented Controls, as the major contributor, was analyzed by grouping with other data elements as follows:

- Less than adequate [ISM function] – resulting in [reporting criteria] – caused by [cause code] / [human performance code couplet] – involving [division]

The detailed analysis is provided in Attachment 3.

Conclusion

In analyzing the various groupings based on the most significant contributors, no pattern emerged that supports a recurring problem from LBNL programs and/or operations.

For the five occurrences involving LTA controls, each occurrence was significantly different in event details, significance category, reporting criteria, and apparent/root causes to indicate that these were not recurring problems. All have been or are currently being addressed with appropriate corrective actions. No additional management actions or submission of an ORPS Category 2R report is required for these events.

Attachment 1 – LBNL ORPS and PAAA Occurrences
October 1, 2003 to September 30, 2004

ORPS and PAAA Events	**Where/when did it happen?** Date, facility, facility function, systems components keywords	**Who was involved?** Facility, Site, PSO, Contractor, work group keyword	**What happened?** Reporting criteria, significance category, additional detail keywords	**How did it happen?** Cause code, human performance code couplet, ISM function, additional detail keywords
Contaminated hood outside B71 PAAA 2003-11	1. 10/20/2003 2. Outside of B71 3. Research labs 4. Old fume hood	1. Building 71 2. LBNL 3. EHS Division 4. Radiation Protection Group	1. Legacy material 2. Non-ORPS reportable 3. Old fume hood found outside B71 with contamination	1. [A7B2C01] Legacy contamination 2. NA 3. Developed/implemented controls LTA 4. Contaminated fume hood found outside of building/controlled area
Violation of LOTO procedures at B74 LBL-OPS-2004-0001	1. 1/13/2004 2. Building 74 3. Research labs 4. Electrical power distribution	1. Building 74 2. LBNL 3. Facilities Division 4. Subcontractors	1. Hazardous energy control (Group 2C.2) 2. Significance Category 3 3. Failure to follow LOTO procedures	1. [A3B1C03] Incorrect performance due to mental lapse 2. [A4B5C13] Accuracy / effectiveness of change not verified or not validated. 3. Perform work with controls LTA 4. Subcontractor did not completely follow their LOTO procedures
Air sample exceeded PEL for lead at 51B demolition LBL-OPS-2004-0002	1. 2/25/2004 2. Building 51B 3. External Proton Beam Hall 4. Demolition project	1. Building 51B 2. LBNL 3. Facilities Division 4. Subcontractors	1. Personnel exposure above PEL (Group 2A.5) 2. Significance Category 3 3. Air monitoring results above the PEL	1. [A1B2C07] Error in equipment or material selection 2. NA 3. Develop and implement controls LTA 4. Air sample result required increase in respiratory protection factor.
Regulatory notice of violation at B85 LBL-EHS-2004-0001	1. 3/17/2004 2. Building 85 3. Hazardous Waste Handling Facility 4. Waste management	1. Building 85 2. LBNL 3. EH&S Division 4. Waste Management Group	1. Noncompliance notification (Group 9.2) 2. Significance Category 4 3. DTSC inspection	NA (causes not determined for Category 4 events)

Attachment 1 – LBNL ORPS and PAAA Occurrences
October 1, 2003 to September 30, 2004

PAAA/NTS program administration strengthening PAAA 2004-01	1. 5/11/2004 2. LBNL 3. PAAA Program 4. Program improvements	1. LBNL 2. LBNL 3. PAAA Program 4. LBNL PAAA Coordination Office	1. Management concern 2. Non-ORPS reportable 3. Programmatic improvements to PAAA Program	1. [A4B1C01] Management policy guidance/expectations not well-defined, understood, or enforced 2. NA 3. Feedback and improvements LTA 4. EH6 reviewers of LBNL PAAA Program identified PAAA issues which need improvement
UCB subcontractor working without GERT at Donner PAAA 2004-02	1. 5/17/2004 2. Donnor Lab 3. Research lab 4. Radiation training	1. Donnor Lab 2. UCB 3. UCB Facilities Dept. 4. Subcontractor	1. Management concern 2. Non-ORPS reportable 3. Worker conducted work in controlled area without GERT	1. [A6B1C02] Training requirements not identified 2. NA 3. Scope of Work LTA 4. General Employee Radiation Training (GERT) was not provided.
Fire Truck Accident at Grizzly Peak Gate LBL-EHS-2004-0002	1. 5/18/2004 2. Grizzly Peak Gate 3. Traffic 4. Vehicular accident	1. Grizzly Peak Gate 2. LBNL 3. EH&S Division 4. Alameda County Fire Dept.	1. Near Miss (Group 10.3) 2. Significance Category 3 3. Fire truck brake failure	1. [A2B6C01] Defective or failed part 2. NA 3. Developed/implemented controls LTA 4. Fire truck brakes failed, but not due to design insufficiency, mechanical defect, or driver error.
Custodian disregards instructions and enters posted RMA at B88 PAAA 2004-03	1. 5/20/2004 2. B88 3. Research labs 4. Non-authorized entry into posted area	1. B88 2. LBNL 3. Facilities Division 4. Custodial staff	1. Management concern 2. Non-ORPS reportable 3. Custodian removed trash from controlled area contrary to specific supervisor instructions	1. [A3B1C06] Wrong action selected based on similarity with other actions 2. [A4B1C01] Management policy guidance/expectations not well-defined, understood, or enforced 3. Developed/implemented controls LTA 4. Custodian emptied trash in controlled area contrary to supervisor's instruction not to enter

Attachment 1 – LBNL ORPS and PAAA Occurrences
October 1, 2003 to September 30, 2004

Worker contamination from U238 spill in B70A lab PAAA 2004-04	1. 6/18/2004 2. B70A 3. Research lab 4. Incorrect chemistry operation resulted in minor contamination to worker	1. B70A 2. LBNL 3. Earth Sciences Division 4. Researcher	1. Personnel contamination 2. Non-ORPS reportable 3. Minor U238 contamination to employee working in RMA hood	1. [A3B1C03] Incorrect performance due to mental lapse 2. [A6B1C03] Work incorrectly considered "skill of the craft" 3. Performed work LTA 4. Incorrect chemistry operation in RMA hood resulted in minor contamination to worker with U238
Fire at Trailer 29B & 29C LBL-EHS-2004-0003	1. 9/5/2004 2. Trailers 29B & 29C 3. Abandoned facilities 4. Fire prevention	1. Trailers 29B & 29C 2. LBNL 3. EH&S Division 4. Alameda County Fire Dept.	1. Fire that activated sprinkler system (Group 2B.3) 2. Significance Category 3 3. Brush fire damaging picnic table, deck, & exterior walls of trailers	1. [A7B1C03] External fire or explosion 2. NA 3. Developed/implemented controls LTA 4. Brush was not sufficiently cleared to prevent grass fire that also damaged structures.
Penetration of Non-Energized Conduit at B76 LBL-OPS-2004-0003	1. 9/14/2004 2. B76 3. Facilities motor pool 4. Electrical safety	1. B76, room 109 2. LBNL 3. Facilities Division 4. Facilities workers	1. Management concern for electrical safety 2. Significance Category 3 3. Probing excavation for Environmental restoration project resulted in penetrating underground line	1. [A3B2C01] Strong rule incorrectly chosen over other rules; [A3B1C01] Check of work was LTA 2. [A4B4C03] Appropriate level of in-task supervision not determined prior to task; [A4B5C01] Problem identification methods did not identify need for change 3. Performed work LTA 4. Insufficient supervision and inadequate adherence to work procedures resulted in penetration of non-energized underground utility line.

Attachment 2 – Major Contributors to LBNL Occurrences
October 1, 2003 to September 30, 2004

Major Contributors	
	frequency
Cause code	
A1B2C07 Error in equipment or material selection	1
A2B6C01 Defective or failed part	1
A3B1C01 Check of work LTA	1
A3B1C03 Incorrect performance due to mental lapse	2
A3B1C06 Wrong action selected based on similarity with other actions	1
A3B2C01 Strong rule incorrectly chosen over other rules	1
A4B1C01 Management policy guidance/expectations not well defined, understood, or enforced	1
A6B1C02 Training requirements not identified	1
A7B2C01 Legacy contamination	1
A7B1C03 External fire or explosion	1
Human performance code couplet	
A3B1C01 coupled with A4B5C01 Problem identification methods did not identify need for change	1
A3B1C03 coupled with A4B5C13 Accuracy/effectiveness of change not verified or not validated	1
A3B1C03 coupled with A6B1C03 Work incorrectly considered "skill of the craft"	1
A3B1C06 coupled with A4B1C01 Management policy guidance/expectations not well-defined, understood, or enforced	1
A3B2C01 coupled with A4B4C03 Appropriate level of in-task supervision not determined prior to task	1
Facility	
B51B	1
B70A	1
B71	1
B74	1
B76	1
B85	1
B88	1
LBNL grounds	1
UCB	1
trailers 29	1
Division	
Earth Sciences	1
Environment, Health and Safety (EHS)	4
Facilities	4
Facilities (UCB)	1
Operations/Directorate	1
Reporting Criteria	
Legacy material	1
Management concern	4
Near miss	1
Fire	1
Personnel contamination	1
Hazardous energy control	1

Attachment 2 – Major Contributors to LBNL Occurrences
October 1, 2003 to September 30, 2004

Exposure above PEL	1
Notice of violation	1
ISM function	
Scope of work LTA	1
Analyzed hazards LTA	0
Developed/implemented controls LTA	5
Performed work within controls LTA	3
Feedback/improvement LTA	1

Attachment 3 – Analysis of Element Groupings from Multiple Contributors
October 1, 2003 to September 30, 2004

Multiple Contributor: [ISM function] Developed/implemented controls LTA (5)

Less than adequate [ISM function]	resulting in [reporting criteria]	caused by [cause code] / [human performance code couplet]	involving [division]	Event
Developed/implemented controls	Legacy material	A7B2C01 Legacy contamination	Environment, Health and Safety (EHS)	Contaminated hood outside B71 PAAA 2003-11
Developed/implemented controls	Personnel exposure above PEL	A1B2C07 Error in equipment or material selection	Facilities	Air sample exceeded PEL for lead at 51B demolition
Developed/implemented controls	Management concern	A3B1C06 Wrong action selected based on similarity with other actions A4B1C01 Management policy guidance/ expectations not well-defined, understood, or enforced	Facilities	Custodian disregards instructions and enters RMA at B88 PAAA 2004-03
Developed/implemented controls	Near miss	A2B6C01 Defective or failed part	Environment, Health and Safety (EHS)	Fire truck accident at Grizzly Peak Gate LBL-EHS-2004-0002
Developed/implemented controls	Fire that activated sprinkler system	A7B1C03 External fire or explosion	Environment, Health and Safety (EHS)	Fire at Trailer 29B & 29C

Analysis: For events with "less than adequate developed/implemented controls," differences in the reporting criteria, cause code, human performance code couplet, division and event details indicate that these are not recurring problems.