

injured.

**Similar OR Report Number:** 1. NA--LASO-LANL-FIRNGHELAB-2009-0015

**Facility Manager:**

Name	Richard Holmes
Phone	(505) 606-2394
Title	Facility Operations Director

**Originator:**

Name	WATERS, MARTHA D.
Phone	(505) 606-0277
Title	OCCURRENCE INVESTIGATOR

**HQ OC Notification:**

Date	Time	Person Notified	Organization
NA	NA	NA	NA

**Other Notifications:**

Date	Time	Person Notified	Organization
04/06/2011	08:15 (MTZ)	Herman LeDeux	DOE/LASO

**Authorized Classifier(AC):** Martha D. Waters      Date: 04/27/2011

**4)Report Number:**

[NA--PS-BWP-PANTEX-2011-0017](#) After 2003 Redesign

**Secretarial Office:**

National Nuclear Security Administration

**Lab/Site/Org:**

Pantex Plant

**Facility Name:**

Pantex Plant

**Subject/Title:**

Laser System Malfunction - Beam Discharged

**Date/Time Discovered:**

03/17/2011 17:07 (CTZ)

**Date/Time Categorized:**

03/17/2011 18:01 (CTZ)

**Report Type:**

Final

**Report Dates:**

Notification	03/21/2011	17:40 (ETZ)
Initial Update	04/28/2011	15:25 (ETZ)
Latest Update	04/28/2011	15:25 (ETZ)
Final	04/28/2011	15:25 (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:**

A1B2C09 - Design/Engineering Problem; Design output LTA; Errors not recoverable  
 A3B3C05 - Human Performance Less Than Adequate (LTA); Knowledge Based Error; Incorrect assumption that a correlation exists between two or more facts  
 -->couplet - A5B2C08 - Communications Less Than Adequate (LTA);

Written Communication Content LTA; Incomplete / situation not covered

A4B1C04 - Management Problem; Management Methods Less Than Adequate (LTA); Management follow-up or monitoring of activities did not identify problems

**ISM:**

4) Perform Work Within Controls

**Subcontractor Involved:**

No

**Occurrence Description:**

On March 17, 2011, at approximately 1707 hours, B&W Pantex management determined a concern exists with a Laser System, following discussions with personnel. An issue occurred on March 16, 2011, involving a laser beam. While performing research activities, a B&W Pantex Scientist was utilizing the laser in a facility and the system malfunctioned discharging the laser beam unexpectedly. As a result, a tube was welded to the holding fixture. There was no personnel exposure to the laser beam, injuries, damage to the facilities, or any threat to security, or the environment as a result of this event. A critique was held on March 21.

**Cause Description:**

The Cause Analysis process and various tools used for this event included Apparent Cause Analysis, Why Tree, Time Line, Barrier Analysis, and Human Error Evaluation using Institute of Nuclear Power Operations (INPO), B&W Guidelines, and an Extent of Condition Evaluation. The results from this process were determined using the Cause Analysis Tree in DOE G 231.1-2.

The primary causal factor that most contributed to the event was a design flaw in the waveform generator allowed a continuous pulse to be delivered without pressing the trigger button; however, this is outside the control of B&W Pantex to correct. The manufacturer was notified of this condition, reproduced the scenario, and got the same results. This has a cause code of A1B2C09.

The scientist performing research activities made an adjustment to the duty cycle setting without powering down the laser. The laser is normally powered down before adjustments are made; however, there is not a written procedure directing this action. This is a cause code of A5B2C08 and will be addressed by corrective action one.

The scientist did not push the fire button; however, the laser fired. Based on past experience and knowledge, the scientist assumed the laser would only fire when the fire button was pushed. This has a cause code of A3B3C05. This will be addressed by corrective actions one and three.

Only one of the three managers in the department is qualified to observe operations. During a workplace surveillance, the manager did not identify a lack of documentation for verbal acknowledgement or powering down. This is a cause code of A4B1C04. This will be addressed by corrective action four.

Extent of Condition:

This laser system operation is different than any other used on plant site in regards to laser type, manufacturer, and most importantly, the use of an external triggering device. The safety significance could be injury to personnel or damage to equipment.

**Operating Conditions:**

Operational

**Activity Category:**

Facility/System/Equipment Testing

**Immediate Action(s):**

Laser system was powered down.  
 Removed the laser key.  
 Applicable laser activities were placed on hold and the system was tagged with a Do-Not-Use tag.  
 Contacted consultant, manufacturer of laser, and manufacturer of waveform generator.

**FM Evaluation:**

The consequence of this event is the tube was welded to the holding fixture instead of just drilling a hole in the tube. The laser inadvertently activated but did not cause any personnel injury. The effects of this event are the cost and time delay due to the suspense of operations, damage to equipment, critique meeting, walk-downs, causal analysis, and corrective actions taken to correct, mitigate, and prevent recurrence.

Applicable laser operations will remain on hold until after evaluation, cause analysis, and corrective actions are implemented.

**DOE Facility Representative**

**Input:**

**DOE Program Manager**

**Input:**

**Further Evaluation is Required:**

No

**Division or Project:**

Special Nuclear Materials (SNM) Division

**Plant Area:**

Zone 11

**System/Building/Equipment:**

Class IV Laser System

**Facility Function:**

Balance of Plant - Infrastructure (Other Functions not specifically listed in this Category)

**Corrective Action 01:**

<b>Target Completion Date:</b> 06/01/2011	<b>Actual Completion Date:</b>
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System setup changes to mitigate known hazards (install additional trigger device, change orientation, etc).

POC Luis Elizondo

**Corrective Action 02:**

<b>Target Completion Date:</b> 06/30/2011	<b>Actual Completion Date:</b>
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Perform Laser System Hazard Assessment after modifications are complete.

POC Don Avirett

**Corrective Action 03:**

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**Target Completion Date:**06/01/2011 **Actual Completion Date:**

Create/publish a division procedure that contains equipment operational instructions

Submit a change request and draft copy of the document in Classified Optix.

POC Luis Elizondo

**Corrective Action 04:**

**Target Completion Date:**07/30/2011 **Actual Completion Date:**

All managers in department will obtain LSR - Laser Safety qualification.

POC Luis Elizondo

**Lessons(s) Learned:**

A Quality Alert was sent out to share with NSE sites and the rest of the DOE complex.

**HQ Keywords:**

05D--Mechanical/Structural - Mechanical Equipment Failure/Damage  
 08C--OSHA Reportable/Industrial Hygiene - Industrial Hygiene Exposure  
 08K--OSHA Reportable/Industrial Hygiene - Near Miss (Other)  
 12E--EH Categories - Equipment Degradation/Failure  
 14L--Quality Assurance - No QA Deficiency

**HQ Summary:**

On March 17, 2011, following discussions with personnel, Pantex management became aware that a laser beam malfunction had occurred on March 16. A Pantex scientist was utilizing the laser in a facility to perform research activities and the system malfunctioned by discharging the laser beam unexpectedly. As a result, a tube was welded to the holding fixture. The laser system was powered down and the laser key was removed. Applicable laser activities were placed on hold and the system was tagged with a Do-Not-Use tag. A consultant, the laser manufacturer, and the wave form generator manufacturer were contacted. There were no personnel exposures from the laser beam, injuries, damage to the facilities, or any threat to security or the environment as a result of this event. A critique was held.

**Similar OR Report Number:** 1. None identified.

**Facility Manager:**

Name	Luis Elizondo
Phone	(806) 477-4853
Title	SNM Technical Department Manager

**Originator:**

Name	BROWN, CHRISTIE M.
Phone	(806) 477-6217
Title	SPECIAL NUCLEAR MATERIALS DIVISION

**HQ OC Notification:**

Date	Time	Person Notified	Organization
NA	NA	NA	NA

**Other Notifications:**

Date	Time	Person Notified	Organization