From:	Matthew Quinn
To:	David E Johnson; Todd R Johnson; Victor E Scarpine; Jinhao Ruan; James K Santucci; Carlo Ferrari; Craig Hogan; Si Xie; Cristian Pena; Carlos Escobar; Donna L Kubik
Cc:	Dave Baird Jr
Subject:	FW: LANL Laser ORPS
Date:	Wednesday, December 11, 2019 11:55:07 AM
Attachments:	opex_logo.png

Everyone,

Please have a look at the description of a recent laser-related incident at LANL.

Thanks,

Matt

https://opexshare.doe.gov/lesson.cfm/2019/12/5/29402/Daily-ORPS-Summary-for-December-5-2019

MANAGEMENT SYNOPSIS: At 1200 on November 7, 2019, a Dual-Axis Radiographic Hydrodynamic Test Facility (DARHT) Experiments and Diagnostics (J-4) worker (W1) removed a fiber optic laser cable from a laser diagnostic system without turning off power to the Erbium-Doped Fiber Amplifier (EDFA), in violation of the hazardous energy control process stated in the Integrated Work Document (IWD). W1 immediately recognized the error, reconnected the cable and removed the key from the EDFA. W1 did not recognize the potential hazard and continued work without notifying management. On November 13, 2019, while discussing work, W1 mentioned the incident to his J-4 Group Leader (GL). The GL immediately made the necessary notifications and escorted W1 to LANL Occupational Medicine (OM). OM personnel evaluated W1 and released him back to work with no restrictions. J-4 personnel removed the equipment from service pending the procurement of an additional safety device. There was no impact to personnel safety, health or the environment.

BACKGROUND The Impulse Laser System is used in High Explosives (HE) experiments and is comprised of a class 4 laser, the EDFA, and output box. The system is regularly transported to different locations and set up in various configurations per the experiment requirements. Transportation and regular reconfiguration of the system often result in the Operating Experience Page 9 of 11 need for maintenance and troubleshooting. Fiber cables fully enclose the lasers emitted through the device. The laser portion of the system produces hazardous energy which is then channeled through light generated by the EDFA to create the beam used in experiments, however the light generated by the EDFA on its own is not hazardous. The system contains two keys to lock out power, one to the laser and one to the EDFA. Newer versions of the system contain one key to lock out power to both the laser and EDFA. The IWD states that workers must remove all keys to the system before beginning maintenance, however it does not specifically state the requirement to remove the key to the EDFA. Workers are required to wear the correct Personal Protective Equipment (PPE) based on the laser wavelength(s) and if the laser beam is exposed. As W1 was performing troubleshooting activities on the system and power to the laser was not on, he was not required to wear PPE. At 0930, on November 7, 2019, W1 moved racks containing the laser system to a new location to begin set up for an experiment. W1 turned the laser system on and discovered the system was not providing a signal to other diagnostic racks and required maintenance. W1 removed the keys, and began trouble-shooting activities. At 1200, on the

third iteration of troubleshooting, W1 turned off the laser and removed the key, but did remove the key to the EDFA. W1 removed one fiber optic cable before recognizing that he did not remove the key to the EDFA, however he did not recognize the error as a failure to follow a hazardous energy control process and continued with troubleshooting activities. W1 immediately reconnected the cable and removed the key from the EDFA. Following further unsuccessful troubleshooting activities, W1 paused work and left the set up in a safe configuration until management was notified. At 1100, on November 13, 2019, at the earliest opportunity, W1 discussed the troubleshooting activities with the J-4 GL. Immediately on discovering that W1 had removed the cable while the EDFA still had power, the J-4 GL took the worker to Occupational Medicine as a precaution. OM personnel evaluated W1, determined there were no injuries and released W1 back to work without restrictions. J-4 personnel did not recognize this event as an abnormal event requiring notification to the WFO Duty Officer/FOD. Following the event, the J-4 Laser Safety Officer (LSO) performed calculations on the light emitted by the EDFA when the laser is switched off and determined that the energy generated by the EDFA without the laser is not hazardous. On November 15, 2019, the deputy Weapons Facility Operations (WFO) Facility Operations Director (FOD) received notification of the event via the Injury/Illness report and initially categorized the event as reportable under Group 2D(2), Report Level Low. At 1300, on Monday, November 18, 2019, the deputy WFO FOD held a fact finding where he confirmed categorization. Operating Experience Page 10 of 11 Ref: IM Tool No: 2019-1965 Cause Description: Operating Conditions: Activity Category: Immediate Action(s): 1. W1 reconnected the cable and removed power from the EDFA. 2. On notification of the event, the J-4 GL escorted W1 to LANL OM. 3. OM personnel evaluated W1 and released him back to work with no restrictions. 4. WFO will hold a learning team to review the event and the FOD notification process. Further corrective actions identified will be managed through to closure in the LANL Issues Management (IM) Tool. 5. The WFO FOD will discuss the FOD notification process at the next HE Managers meeting to ensure all managers are aware of the process and timeliness requirements. 5. J-4 management will investigate possible engineering controls to prevent the removal of cables while the laser and EDFA are powered. Any further corrective actions identified will be managed through to closure in the LANL Issues Management Tool.

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From: OPEXShare <opexshare@rl.gov>
Sent: Monday, December 9, 2019 6:01 AM
To: Matthew Quinn <mquinn@fnal.gov>
Subject: Weekly OPEXShare Articles

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LESSONS LEARNED, BEST PRACTICES

Publish Date	Article Link
December 02, 2019	Daily ORPS Summary for December 2, 2019
December 03, 2019	Daily ORPS Summary for December 3, 2019
December 04, 2019	Daily ORPS Summary for December 4, 2019

December 05, 2019 Daily ORPS Summary for December 5, 2019

December 06, 2019 Daily ORPS Summary for December 6, 2019

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