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## The Importance of Reporting Near Misses

### Introduction

Every day, incidents that could result in a serious injury occur on the job. These incidents are commonly referred to as “near misses” and are described as follows in the Department of Energy (DOE) Order 232.2A, *Occurrence Reporting and Processing of Operations Information*:

“A near miss to an injury, where something physically happened that was unexpected or unintended AND where no barrier prevented an event from having a reportable consequence (i.e., happenstance was the main reason the event did not result in a reportable injury).”

This Operating Experience Summary document provides examples and information about the importance of reporting near misses.

### Background

The DOE Integrated Safety Management (ISM) policy (DOE Policy 450.4, Safety Management System Policy) identifies five core safety management functions that provide the necessary structure for any work activity. These functions are applied as a continuous cycle with the appropriate degree of rigor to address the type of work activity and the hazards involved (see Figure 1). The core function of Feedback and Improvement provides a structure in which feedback information on the adequacy of controls is gathered, and opportunities for improving the definition and planning of work are identified and implemented. DOE establishes the expectation for a high-functioning safety culture, and the Feedback and Improvement function incorporates continuous improvement as a fundamental element of that culture. Feedback and improvement are made possible, in part, by the willingness to learn

from our mistakes and to enable others to learn from them, as well.

Others can learn from our mistakes only when those experiences are effectively shared amongst and between organizations. It is important to report near misses to help prevent them from potentially becoming “hits.” Reporting these incidents allows them to be investigated and their causes to be determined and eliminated. The lessons learned from these events can be developed and then communicated to help ensure the adequacy of controls and improve safety and quality of work practices throughout DOE.



Figure 1. DOE Integrated Safety Management System Core Functions

DOE Order 232.2A requires that near misses be reported into the Occurrence Reporting and Processing System (ORPS) as management concerns, based on the reporting criterion. Some recent events that were reported into ORPS are detailed below. These events include lessons learned that are captured and shared to prevent recurrence of adverse incidents. Additionally, some

results and corrective actions associated with the events are noted, as examples of the positive effects of reporting these near misses on the future actions of defining the scope, planning, and execution of work.

## Incident Descriptions

### *Near Miss to an Occupational Injury: Hoisting Equipment Failure Causes Steel Support Column to Fall on other Steel Structures*

On September 5, 2018, during a hoisting operation at a construction site at Los Alamos National Laboratory ( ), a 48-foot, 7,000-pound steel support column fell, crashing into other steel structures, fortunately causing no injuries. Subsequent review found that the main hoist rope attached to a sling securing the column failed. An investigation revealed that the main hoist rope was synthetic, due to the requirement for electrical non-conductivity, and while the outer sheath of the rope showed some minor wear, critical damage to the load-carrying core of the rope was hidden. The lesson to be learned from this incident is that users of digger derricks and other hoisting equipment using synthetic rope should become familiar with the manufacturer and industry recommendations for inspection of the rope and should establish criteria for when to replace the rope regardless of the results of any visual inspection. In response to this incident, a decision was made by the organization to routinely replace synthetic hoist ropes on an annual basis. (ORPS Report NA--LASO-GOLA-BOPLASO-2018-0001)

One month after the hoisting equipment failure at LANL, a similar incident resulted in a fatality and a severe injury at a non-DOE construction site in Evanston, IL. A crane was lifting steel support beams for a 9-story apartment building when the rigging failed, causing the beams to drop 30 feet and strike the workers. See Photo 1.



*Photo 1. Construction site in Evanston, IL where worker was killed. (Photo credit: C. Boyle/The Daily Northwestern)*

### *Near Miss Event Where Manipulator and Cart Were Upended*

On June 25, 2018, a vendor was providing maintenance training on a manipulator at the Hanford Site. The manipulator was attached to a site-built cart and weighed approximately 1,200 pounds. Because of excessive noise due to concrete drilling and congestion in the work area, the vendor asked if the manipulator could be moved to another area. While in the process of moving the manipulator, the crew attempted to traverse a cable protector that was on the floor. When one of the cart wheels contacted the cable protector, the cart and manipulator were upended. None of the crew was injured as a result. Relocation of the manipulator cart was not a planned work evolution, and therefore potential hazards associated with this activity had not been evaluated. As a result of this incident, signage was created for posting on all similar equipment that read: "Requires Engineering Evaluation" or "Operations Management approval required before use/relocation." The work crew was briefed on the event, the prohibition of moving wheeled loads over cable protectors, work-authorizations, pre-job requirements, scope creep, chain of command, and expectations related to hazard evaluation before work performance. (ORPS Report EM-RL--CPRC-324FAC-2018-0003)

### *Near Miss: Worker Falls While Installing Asphalt Near Interim Storage Area (ISA-1)*

On October 11, 2017, a construction worker at the Idaho Cleanup Project was raking and grading asphalt, when he lost his balance and tripped over a concrete headwall. He fell backwards approximately five feet into a concrete drainage ditch, landing mostly on his right shoulder and also on his head. The worker's hard hat remained on during the fall. He was immediately taken for medical evaluation, and later released to work with some minor restrictions. Temporary barriers were placed around the headwalls until more permanent barriers could be installed. This incident revealed hazard analysis weaknesses during the work package development process; in particular, a failure to involve workers in the design, and to walk down the area to ensure that potential or known hazards are identified. As a corrective action, walkdowns were conducted to evaluate any other areas with similar fall potentials. (ORPS Report EM-ID--FID-ICPWM-2017-0002)

### Near Miss: Worker Enters Room during Low Oxygen Alarm Activation

On September 13, 2017, a Subject Matter Expert (SME) entered a room at LANL while a low oxygen alarm was activated. The SME was responding to the alarm and, on arrival to the entrance of the room, identified a relief valve on the thermal vacuum system that was releasing liquid nitrogen inside the room. The SME isolated the relief valve by turning the supply valve off, placing the system in a safe configuration, and then left. The low oxygen alarm stopped sounding within 20 minutes of the SME isolating the relief valve. This was an incorrect response to the alarm. The SME exhibited a lack of adherence to and knowledge of the requirement that prohibited entry into the room during the activation of the low oxygen alarms. The low oxygen alarm posting in the room was located at a height of 11 feet--a height where it was not obvious to workers--and did not include any contact information. Additionally, the building emergency plan had not been updated to reflect the low oxygen alarm emergency response requirements for the room. Following this incident, a power disconnect emergency shut-off switch was installed next to the room entry door, which will close the main liquid nitrogen tank and the associated valves during an emergency. The sign was relocated to eye-level height and modified to include contact information (see photo 2). The building emergency plan was updated. Personnel were instructed to not enter the room when the low oxygen monitors are sounding an alarm, and a drill was conducted. A Lessons Learned article, ID: LANL-2017-945 was developed for this event. (ORPS Report NA--LASO-LANL-PHYSCOMPLX-2017-0001)



Photo 2. Images from Lesson Learned ID: LANL-2017-945, showing warning sign at entrance to laboratory

### Exposed Trace Heat at 200W P&T

On August 28, 2017, a worker at Hanford discovered that the end cap of a 277-volt alternating current trace heat wire was removed. The worker barricaded the area and informed management of the potential exposure of an uninsulated electrical conductor. Operations initiated an investigative work package to install Lockout/Tagout (LOTO) to the circuit, and to have an electrician investigate to determine if the heat tape had an exposed conductor. On August 29, the LOTO was installed, and the electricians determined that there were indeed exposed conductors at the end of the line that were not administratively controlled. A correct end seal kit was then installed per the manufacturer's instructions to prevent exposure of the conductors. (ORPS Report EM-RL--CPRC-GPP-2017-0005)

### **Discussion**

Near miss events involve little or no damage and so may be overlooked and not followed up on or reported. However, near misses provide a "free" opportunity to identify previously unidentified and/or uncontrolled hazards and to correct them during future work planning processes.

Some DOE personnel may not be aware of the DOE requirement to report these events, which differs from Occupational Safety and Health Administration recordkeeping and reporting requirements. By reporting near misses and suggesting corrective actions, the lessons they provide can be learned "the easy way" by all organizations. Near miss reporting systems, including ORPS, can be used to gather data for statistical analysis, correlation studies, trending, and performance measurement. Near miss reporting can also be used as a training opportunity to learn from and prevent more serious incidents from occurring. The [DOE Corporate Lessons Learned Database](#) and the Operating Experience Committee (per DOE O 210.2A, *DOE Corporate Operating Experience Program*) are collaborative avenues where near miss and leading indicator information and lessons can be shared across the DOE Complex and externally.

There are valuable lessons to be learned when a near miss occurs. Evaluating the near miss as if a negative outcome had occurred can reveal opportunities for improvement in the safety management system that

may help prevent future incidents with negative outcomes from occurring. There are many historical examples that have shown that serious and even catastrophic events were preceded by near misses that were ignored, and had they been properly evaluated, and their causes corrected, the incident would have been prevented from occurring.

## Leading Indicators and Safety Culture

Near miss reports serve as a leading indicator of safety performance and safety culture. Establishing and maintaining a safety-conscious work environment involves employees feeling empowered to raise safety concerns to management without fear of retaliation, including recognizing and reporting near misses. The willingness to consistently report near misses is a mark of a strong safety culture, and the absence or under-reporting of near misses can suggest cultural weakness within an organization. Strengthening the safety culture should include educating personnel about:

- the value of near miss reporting,
- the importance of leading indicators,
- DOE reporting requirements for near misses, and
- the important role that individuals play in everyone's safety.

Finally, near miss reporting and follow-on discussions provide a valuable opportunity for employee feedback, as well as effective work planning and process improvement. They are an essential part of the ISM System as part of a strong safety culture wherein everyone communicates and contributes in a responsible manner to their own safety and that of their fellow workers.

## References

*DOE Order 210.2A: DOE Corporate Operating Experience Program*

*DOE Order 232.2A: Occurrence Reporting and Processing of Operations Information*

*DOE O 450.2, Chg 1 (MinChg), Integrated Safety Management*

*DOE P 450.4, Safety Management System Policy*

*DOE G 450.4-1C, Integrated Safety Management System Guide*

ORPS Report EM-RL--CPRC-324FAC-2018-0003. Near Miss Event Where Manipulator and Cart Were Upended.

ORPS Report NA--LASO-GOLA-BOPLASO-2018-0001. Near Miss to an Occupational Injury: Hoisting Equipment Failure Causes Steel Support Column to Fall on other Steel Structures.

ORPS Report EM-ID--FID-ICPWM-2017-0002. Near Miss: Worker Falls While Installing Asphalt Near Interim Storage Area (ISA-1).

ORPS Report NA--LASO-LANL-PHYSCOMPLX-2017-0001. Near Miss: Worker Enters Room during Low Oxygen Alarm Activation.

ORPS Report EM-RL--CPRC-GPP-2017-0005. Exposed Trace Heat at 200W P&T.

Karish, Kristina. "One worker killed, another in critical condition after crane accident." The Daily Northwestern. October 9, 2018. Accessed December 17, 2018 at

<https://dailynorthwestern.com/2018/10/09/lateststories/one-killed-one-injured-in-crane-collapse-at-emerson-street-construction-site/>

## Additional Resources

National Safety Council. Near Miss Reporting Systems. <https://www.nsc.org/Portals/0/Documents/WorkplaceTrainingDocuments/Near-Miss-Reporting-Systems.pdf>

National Safety Council. What is a Near Miss in the Workplace Really Telling You? <https://www.nsc.org/work-safety/tools-resources/near-miss-reporting>

American National Standards Institute (ANSI) Z10 – 2012 Occupational Health and Safety Management Systems.

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