Office of Environment, Health, Safety and Security
Operating Experience Level 3

OE-3: 2021-03 June 2021

Lawn Mowing Safety Amid Peak Mowing Season

Purpose

This Operating Experience Level 3 (OE-3) document provides information on recent events involving lawn mowing equipment that have occurred at Department of Energy (DOE) facilities. The Office of Environment, Health, Safety and Security would like to raise immediate awareness to the potential hazards associated with lawn mowers as we enter peak mowing season.

Background

Although commercial lawn mowers are efficient and effective vehicles for lawn maintenance, they present several inherent hazards and should be operated with extreme caution. Lawn mowing equipment exposes workers to a variety of hazards including crushing, amputation, and struck-by hazards. Without proper mowing procedures and practices in place, the DOE complex is susceptible to mowing incidents that could result in employee injury, death, or property damage.

Incident Descriptions

In 2021, two noteworthy lawn mowing incidents were reported in the DOE Occurrence Reporting and Processing System (ORPS).

The most recent event occurred at the Idaho National Laboratory on the Research and Education Campus. On April 26, 2021, a service subcontractor was mowing a section of lawn between a building driveway and a small creek that runs adjacent to the building. As they were driving north near the creek bank, they encountered a change in terrain which caused the mower's right drive wheel to lose traction. This loss of traction caused the mower to quickly turn and begin sliding down the slope towards the creek. The mower slid off the bank into the creek, ending upside down in the water. Safety systems built into the mower shut down the engine as the mower tipped over into the creek. The mower was equipped with a roll-over protective structure (ROPS). After unbuckling their seatbelt, the operator crawled out from under the mower and climbed out of the creek. Fortunately, there were no injuries that occurred from this event. *(NE-ID--BEA-REC-2021-0001, Near Miss to Injury When Lawn Mower Tips Over)*

Photo 1. Zero Turning radius riding lawn mower at Idaho National Laboratory.

The second event occurred at Sandia National Laboratories California near Building 910 on A-Street. On April 20, 2021, a subcontractor was operating a skid steer with a mowing attachment

to mow an area adjacent to A-Street. The equipment operator was halfway up a hill and determined that he could not go up any further because of the uneven terrain. The operator ceased mowing operations and was attempting to transition from the vegetated area to the pavement by crossing a drainage ditch. While crossing the drainage area, the skid steer became unbalanced and tipped onto its side. The worker was not injured. *(NA--SS-SNL-8000-2021-0005, Skid Steer Tipped Over during Mowing Operations)*

Photo 2. Equipment with mowing attachment at Sandia National Laboratories California.

Nearly ten years ago on September 13, 2011, DOE experienced a fatality when a recently hired, untrained subcontractor employee struck three large, elevated pipes while operating a front deck mower at the Strategic Petroleum Reserve Bryan Mound site. The accident was quickly discovered and reported by one of the co-workers cutting grass in the vicinity, who found the employee pinned between the mower and an elevated pipe. Cardiopulmonary resuscitation was initiated within five minutes and treatment continued until the employee was transported by ambulance from the accident scene. The employee was subsequently pronounced dead by medical authorities. The preliminary cause of death was indicated as blunt force trauma. *(FE—SPRO-SPR-BM-2011-0001, Grass Cutting Fatality at SPR Storage site)*

This accident met DOE's Accident Investigation Criteria 2.a. (1) of DOE Order 225.1B, *Accident Investigations*, Appendix A: "*Any injury or chemical or biological exposure that results in or is likely to result in, the fatality of an employee or member of the public.*" Based on the severity of this accident and the requirements of DOE Order 225.1B, an accident investigation team was assembled and an Accident Investigation Board was formally appointed in September 2011 to investigate the accident in accordance with DOE Order 225.1B. The *Accident Investigation Report: Fatality at the Strategic Petroleum Reserve Bryan Mound Site, September 13, 2011*, was issued in November 2011.

Photo 3. Position of mower after fatal accident at the Strategic Petroleum Reserve.

A search of the Occupational Safety and Health Administration database was conducted and the following similar incidents were identified:

On August 7, 2020, an employee was mowing the lawn in a church's cemetery. They were heading down a 45-degree slope when they turned the lawn mower to the right to avoid striking a large wooden cross and a pine tree. The riding lawn mower rolled onto its left side and the employee was pinned between the driver's seat, the left steering control lever, and the ground. They suffered internal injuries to their chest, abdomen, and sternum and died via mechanical asphyxiation. According to the owner's manual, this riding lawnmower should not be operated on slopes greater than 20 degrees.

On August 31, 2019, as an employee was mowing the grounds around one of the holes on a golf course, their mower slid and struck an exposed tree root. The employee was pinned under the mower when it tipped over. The incident resulted in a fatality due to a neck fracture.

Recommendations

- Use and maintain all available safety equipment including seat belts and ROPS, where equipped by the manufacturer or required by consensus standards;
- Ensure that all hazards involving mowing operations are properly identified and addressed in pre-job briefings and respective job activity-level hazard analyses;
- Ensure all work planning and control documents include detailed instructions for mowing on slopes, uneven, or damp surfaces, as well as specific stand-off distances for mowing around wires, poles, fences, buildings, and all other obstructions;
- Ensure all workers are provided with comprehensive training on lawn mower operation and safety;
- Employees should walk down all areas to be mowed to determine the equipment needed based on the terrain (sloped, uneven, etc.);
- Uneven terrain and boundaries should be identified along embankments. When necessary, physical markers should be used to designate hazardous areas that are unsafe for the operation of lawn mowers; and
- Ensure pre-job walk downs include checks for animal dens or nests, especially of protected species, to prevent unintended damage and violation.

Photo 4. Baby deer that would be hard to spot in longer grass.

Summary

DOE and DOE contractors need to ensure all workers (including subcontractors) recognize the hazards associated with operating lawn mowing equipment, whether it be manufactured lawnmowers or equipment that is utilizing lawn mowing attachments. It should be recognized that serious hazards exist when using this type of equipment and as a result, routine job activity-level hazard analyses must be performed. Operations and procedures at the activity level should be analyzed and reviewed to identify potential worker protection hazards and deficiencies. A job hazard analysis, also known as a job safety analysis, is the most basic and widely used tool to identify hazards associated with jobs at the activity level. The basic elements of work planning will ensure the equipment is safe to operate, workers are familiar with and trained to perform their task, and all hazards are identified and properly controlled for a safe lawn mowing season.

To promote organizational learning, sites are encouraged to share their experiences and learn more about lawn mower incidents and safety using the DOE OPEXShare Database.

References

Operating Experience: Lessons Learned, LL 2021-0407, *Loss of Mower Control Results in Mower Tip Over* (5/3/2021)

ORPS Report NE-ID—BEA-REC-2021-0001, *Near Miss to Injury When Lawn Mower Tips*

ORPS Report NA--SNL-SNL-8000-2021-0005, *Skid Steer Tipped Over During Mowing Operations*

ORPS Report FE--SPRO-SPR-BM-2011-0001, *Grass Cutting Fatality at SPR Storage Site*

U.S. Department of Energy Office of Health, Safety and Security, Accident Investigation Report: *Fatality at the Strategic Petroleum Reserve Bryan Mound Site, September 13, 2011* (November 2011)

Occupational Safety and Health Administration, *Dangers of Roll-Overs of Riding Mowers*

Occupational Safety and Health Administration, *Fatality and Catastrophe Investigation Summaries*

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This OE-3 document requires no follow-up report or written response.

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