

Oregon OSHA
OSHSPA State Plan Report
February 2019

Michael Wood, Administrator

I. Significant Legislative/Programmatic Changes

Legislatively Mandated Rulemaking: Nothing to report.

Legislative Activity: Nothing to report.

Other Rulemaking Activity:

Pesticide Worker Protection Standard. Oregon OSHA's rules regarding the Division 4/W Worker Protection Standard, specifically the application exclusion zone (AEZ), became effective on January 1, 2019. Oregon OSHA adopted two new administrative rules related to the application exclusion zone and spray innovations with amendments based on comments received.

Standards Improvement Project for Division 1. Oregon OSHA adopted minor corrections to the Division 1 Administrative Rules as proposed. One hearing was held, and no public comments were received.

Permissible Exposure Limits (PELs). In March 2017, Oregon OSHA selected lead and manganese from the PEL advisory group's list of suggested candidates as the first two of approximately four to six candidates to undergo a PEL reduction through the rulemaking process. These substances were selected because of their broad exposure to workers in Oregon across a wide range of industries. Both lead and manganese rulemakings have formed separate advisory committees who are meeting and beginning the rulemaking process.

Lead- Oregon OSHA's Lead rulemaking stakeholder meetings are continuing, and potential rule language is being drafted. Oregon OSHA is working with WA-DOSH in this rulemaking as they are addressing the same issue at the same time. The rules may be different, but stakeholders and technical specialists involved are going to both Oregon and Washington rulemakings. Oregon OSHA expects to reconvene stakeholder meetings in the Spring of 2019, where stakeholders will consider pre-proposal draft language regarding this rulemaking.

Manganese- Oregon OSHA's Manganese rulemaking stakeholder meetings are ongoing, and the Advisory Committee has expanded to include additional stakeholders from affected industries that will be considering the economic impact of any proposed rule changes. Oregon OSHA expects to reconvene stakeholder meetings in the Spring of 2019, where stakeholders will consider pre-proposal draft language regarding this rulemaking.

Agricultural Labor Housing. Oregon OSHA has begun the process of consulting stakeholders regarding updating and improving rules around agricultural labor housing (ALH). Oregon OSHA has put together a stakeholder group with the core consisting of the small agricultural employer advisory committee, as well as members of other interested parties, including worker advocates.

The ALH advisory committee had their first meeting in November 2018, and plans to continue meeting throughout 2019.

Crane Operator Certification. Federal OSHA has adopted a crane operator certification rule update. Oregon OSHA will be proposing language similar to the changes made by federal OSHA, and likely will propose repealing our Oregon initiated rule around crane operator certification in light of the federal final rule. A side by side between the newly adopted federal rules and the current Oregon rules was distributed to stakeholders in multiple committee groups, as well as a draft of pre-proposal language for the rule. Oregon OSHA accepted comments from and continued discussion with stakeholders on the pre-proposal draft through January. Oregon OSHA hopes to have a proposal ready by the end of February and a public hearing in March.

Employer Knowledge. Oregon OSHA plans to propose rulemaking that addresses the issue of employer knowledge and the role of reasonable diligence in determining whether an employer has “constructive knowledge” of a violation in the worksite. A small group of stakeholders met in the summer of 2015 and in the spring of 2016, that reconvened in 2017. This rulemaking has been resurrected and new pre-proposal draft language is being presented to stakeholders throughout the Winter of 2018-2019 as stakeholder groups continue meeting.

All adopted and proposed rules are available at our website <http://www.osha.oregon.gov> - look under Rules and Laws.

II. New Developments/Activities/Notable Cases Activities:

New Publication: *[Ergonomics in construction and general industry](#)*: This brochure helps employers and employees with ergonomic solutions for construction and general industry work. These are available at <https://osha.oregon.gov/pubs/Pages/index.aspx>.

Oregon OSHA News Releases: *Three Training Grants Awarded*: Oregon OSHA has awarded three grants totaling nearly \$120,000 to help develop workplace safety and health education and training programs. Additional information is available at <http://www.osha.oregon.gov>.

Oregon Young Worker Health and Safety Coalition: - *Oregon Young Employee Safety, O[yes]* The annual “Speak up. Work safe.” video contest is underway with the first round of judging submitted videos completed. The top three entries will take home cash prizes ranging from \$300 to \$500, and students will earn a matching amount for their school.

Contest winners will be unveiled at a screening event in spring 2019, and winning entries will be posted on YouTube. For contest information and a playlist of past finalist videos, go to <http://youngemployeesafety.org/contest/>.

Safety Break May 8, 2019: This is the 16th year Oregon OSHA has coordinated the Safety Break, which is voluntary for employers. Businesses and other employers can decide what activities are most beneficial to their workforce. Companies that participate will be entered to win one of three \$100 checks, to be used for a luncheon of their choice, when they sign up on line by May 3.

Oregon Governor’s Occupational Safety and Health (GOSH) Conference will be held March 4-7, 2019, at the Oregon Convention Center in Portland. With 160 workshops and sessions, the conference – the largest of its kind in the Northwest – offers a comprehensive set of learning opportunities in workplace safety and health.

Newsletters: Oregon OSHA publishes two newsletters: The “Resource” (a general interest publication which includes construction) is published every two months, and the “Forest Activities News” (for the logging and forest industry) is an occasional newsletter from Oregon OSHA covering topics of interest to the logging and forest activities employers. These are available at <http://www.osha.oregon.gov> .

Notable Case:

Description of the Accident:

HP Inc. purchased a machine from Proton Energy Systems, which produces hydrogen through the electrolysis of water. The machine was encased in a metal cabinet about six feet tall, with a sealed metal divider separating the “fluid enclosure” where the water was converted into oxygen and hydrogen (left half of the cabinet), and the “electrical enclosure” where the electronics were housed (right half of the cabinet). Hydrogen gas was dried and piped out of the enclosure for service, and fugitive oxygen was vented within the fluid enclosure and pushed out of the cabinet through positive air pressure and cabinet vents. Proton was responsible for the manufacture, delivery, and commission of the machine. HP hired CH2MHill to engineer the external utility, vent, and drain lines for the generator.

On March 22nd, 2018, a senior technician from Proton was in the final step of commissioning the new hydrogen generator before leaving the site and going home. The generator was operating and appeared to be functioning properly. The Proton senior technician pressed the “stop” button at the control panel on the cabinet door, and seconds later, a violent deflagration occurred from within the electrical side of the cabinet, destroying the cabinet and the ceiling fixtures. The Proton technician was struck by one of the metal panels which flew off the enclosure, and he was left in critical condition with internal injuries. A contract worker, who was the site escort for the technician and standing within a few feet of the technician at the time of the deflagration, escaped serious injury. The fire inspector determined that the deflagration occurred due to hydrogen entering the electrical side of the enclosure and finding an ignition source.

Findings:

- 1) The process piping, external of the generator cabinet, was designed and approved by CH2M Hill, an engineering firm. After this approved design was submitted to HP, HP made changes to the hydrogen generator external piping configuration without an engineer’s review and approval. The changes were spurred by the desire to have condensate be collected in a common header before going to a floor drain, instead of draining directly onto the floor of the room. These piping alterations created pathways for hydrogen to migrate from the fluid enclosure to the electrical enclosure. The migration of hydrogen through this pathway could occur if there was hydrogen leaking past a condensate drain trap on either the vent line or fluid enclosure condensate drain line.
- 2) The changes that HP made to the hydrogen generator cabinet and internal piping nullified the Nationally Recognized Testing Laboratory’s (NRTL) ISO 22734 certification of the generator.
- 3) HP emailed Proton to ask if a condensate drain line could be re-routed to an open floor drain instead of allowing the condensate to drain onto the floor as originally designed. Proton stated that it could be done. HP did not provide Proton with drawings or a description of their plan, nor did HP specify that they wanted to interconnect the condensate drain lines from both the electrical and the fluid side.

Other considerations/learning opportunities

- 1) The ISO 22734 standard did not require a flammable gas detector for the electrical enclosure, nor a backflow preventer for the dehumidifier condensate drain line in the electrical enclosure. Additionally, the ISO standard did not require that the electrical enclosure be electrically

classified. Inclusion of one or more of these safety features may improve the overall safety of the generator.

- 2) The owner's manual did not warn against interconnecting the electrical enclosure dehumidifier condensate drain line with the other generator condensate drain lines. Inclusion of that warning may reduce the chance of unsafe site modifications.
- 3) The ISO 22734 standard required the development of a HAZOP study. The HAZOP study developed by Proton did not include the potential hazard of hydrogen gas entering the electrical enclosure. The HAZOP study should include that hazard scenario in order to ensure there are adequate protections in place.
- 4) The owner's manual for the condensate drain traps used by Proton for the hydrogen lines recommended against their use for volatile gas service, and recommends the manufacturer be contacted prior to their use for volatile gas service. Proton did not contact the manufacturer prior to using these condensate drain traps in hydrogen service, but utilized their engineers to determine their suitability for hydrogen service. A failure of the condensate drain trap could allow hydrogen to migrate into the condensate drain lines. Because of HP's site modifications, migration into the condensate drain lines could introduce hydrogen into the electrical enclosure. Consulting the manufacturer when using their product in a type of service other than what was intended by the manufacturer may provide additional safety or design considerations and improve the safety of the system.
- 5) The Proton technician had a concern about the condensate drain piping configuration prior to commissioning the hydrogen generator, but did not present the concern to Proton management. Field technicians should be instructed to notify their employer promptly should they have any concerns about the safe construction or installation of these machines.
- 6) The only safety feature for detection of fugitive gases entering the electrical enclosure was a pair of differential pressure switches physically located within the electrical enclosure. They were designed to alarm should the differential air pressure between the two enclosures become too small (the fluid enclosure was under positive pressure from the ventilation fan). The electrical enclosure was not air-tight, and there was no evidence that the electrical enclosure could hold air pressure well enough to allow the differential pressure reading to change (or at least, change enough to cause an alarm) should gases migrate into the electrical enclosure from the fluid enclosure. The differential pressure switches may have been effective to detect a loss of positive air pressure in the fluid enclosure but may not sense the entry of gases into the electrical enclosure if the electrical enclosure is not capable of holding air pressure.
- 7) The differential pressure switches shared the same sensor hoses, and would likely fail as a pair should one or both of the hoses get obstructed or crimped. The reliability of the pressure switches may be improved by having independent pressure hoses for each sensor.

Images were omitted from this report because they were deemed "proprietary" by HP.

Severity: Death. Probability: Medium. Proposed penalty: \$6000. Employer not eligible for reductions.

OAR 437-001-0760(1)(b)(C): The employer did not take all reasonable means to require employees to use all means and methods, including but not limited to ladders, scaffolds, guardrails, machine guards, safety belts and lifelines, that were necessary to safely accomplish all work where employees were exposed to a hazard:

- a) The employer did not ensure that the condensate drain line configuration for the H Series 4 Hydrogen Generator, as modified by HP from the original design by CH2M Hill and Proton Energy Systems, was

safely engineered to prevent hydrogen migration into the electronic enclosure through the dehumidifier condensate drain line.

Conference dates and locations can be found at:

<http://osha.oregon.gov/conferences/Pages/index.aspx>

Questions? Contact the Conference Section at (503) 378-3272 *or* toll-free in Oregon at (888) 292-5247, option 1. *or* send email to: oregon.conferences@state.or.us

III. Areas of Concern: Nothing new to report.

IV. Information Sought from Other State Programs: Nothing new to report.

V. Administrative Changes: Nothing new to report.

VI. Contact Information: Phone: (503) 378-3272, Fax: (503) 947-7461, Internet: www.osha.oregon.gov, Federal Liaison: Pamela Lundsten, pamela.g.lundsten@oregon.gov