Housekeeping Fatality Report

INCIDENT

On Jan. 5, the U.S. Chemical Safety Board (CSB) released a report on the three deadly fires and explosions that occurred at a Hoeganaes Corp. plant in Gallatin, Tenn., in 2011. The report asserts that the accumulation of fine iron powder in the facility led to the explosions, and that Hoeganaes did not take necessary action to prevent these fatal events. CSB also used its report to highlight the need for an OSHA standard on **Combustible Dust.**

Five workers died and three were injured in three separate incidents at Hoeganaes Corp.'s Gallatin powdered metals plant in 2011. When fine particles of iron dust ignited on Jan. 31, two workers were burned and later died from their injuries. On March 29, a similar flash fire burned another employee. Finally, on May 27, a hydrogen explosion at the plant shook loose iron dust accumulations, which ignited and rained down on workers. The explosion and ensuing fire killed three employees and injured two others.

"The three accidents at the Hoeganaes facility were entirely preventable. Despite evidence released by the CSB and information that Hoeganaes had in its possession even before the first accident in January 2011, the company did not institute adequate dust control or housekeeping measures," said CSB Chairperson Rafael Moure Eraso.

According to CSB, significant amounts of the fine iron powder had accumulated over time in the facility and the company did not reduce the hazards through engineering controls and basic housekeeping. Furthermore, the investigation found that Hoeganaes did not institute procedures such as combustible gas monitoring or provide training for employees on avoiding flammable gas fires and explosions. CSB also found that the company did not require atmospheric testing for hydrogen or other explosive gases.

NEED TO KNOW

Housekeeping at work is as important as it is at home, especially if you want a safe workplace. People who must function every day in a messy, disorderly work environment have lower morale, although they may not be aware of the cause. But the safety ramifications of poor housekeeping in the workplace are even more important.

Poor housekeeping may result in employee injuries or even death, citations by the Occupational Safety and Health Administration (OSHA) (or another regulatory agency) and even difficulty in securing future work. How can such a seemingly “minor” issue such as housekeeping have such serious consequences?

Poor housekeeping practices can result in:

- Injuries when employees trip over, strike or are struck by out-of-place objects.
- Injuries from using improper tools because the correct tool can’t be found.
- Lowered production because of the time spent maneuvering over and around someone else’s mess and time spent looking for proper tools and materials.
- Lack of future work due to a reputation for poor quality.

General housekeeping rules to remember:

- Housekeeping is everyone’s responsibility!
- Clean up after yourself. Pick up trash and debris and dispose of it properly. Keep your work area clean throughout the day, minimizing the time needed to clean a larger mess at the end of the day.
- Dispose of combustibles and flammables properly. If improperly discarded, they will increase the potential for a fire.
- Remove protruding nails and other sharp objects or hammer them flat to prevent someone from being injured by them.
- Stack materials and supplies in an orderly manner and secure them so they won’t topple.
- Report all slips, trips and falls, with or without injury, so the hazard can be corrected.
- Remove any cords or cables in walking areas.
- Organize cables under desks.

MORE CONSEQUENCES OF POOR HOUSEKEEPING

- A trip or fall over lines and leads in walkways and work areas
- A slip or fall on an oily or slippery facility floor, vessel deck or another working surface
- A trip or fall from a dock or vessel
- An allergic reaction to a spilled chemical
- An eye injury from falling grit left in the overhead of a work site
- A fire as a result of oily rags left in an area where hot work is performed, or due to the accumulation of combustible dust
- Illness due to the unsanitary conditions of restrooms
- Electrical shock as a result of poorly maintained equipment or energy sources, such as broken, cracked or damaged insulation and connections of wiring
- Lacerations and amputations when poor maintenance results in inadequate lighting
- Exposure to hazardous substances from poor storage and ineffective labeling of hazardous chemicals
- Slip hazards where snow, ice, or standing-water is left on walkways

MANAGEMENT TRAINING

Here are some results of poor housekeeping practices at work:

- Time spent investigating and reporting accidents that could have been avoided.
- Fires due to improper storage and disposal of flammable or combustible materials and wastes.
- Substandard quality of finished products because of production schedule delays, damaged or defective finishes, ill-equipped employees, etc.
- “Wall-to-wall” OSHA inspections due to the “first impression” of the compliance officer.

BUSINESS / REGULATION

Good housekeeping not only results in a cleaner workplace, but makes it safer as well. Good housekeeping reduces illnesses and injuries and promotes positive behaviors, habits, and attitudes. Employers are responsible for assessing each workplace before work begins to identify the potential hazards present, and determine ways to eliminate the hazards. An effective housekeeping program is an important element in workplace safety and health management systems.

Uncluttered working conditions are essential to the safety of all workers and should be maintained at all times in both work and office areas. Proper housekeeping management provides for an orderly arrangement of operations, tools, equipment, storage facilities, supplies, and waste material. Good housekeeping is evidenced by floors free from grease and oil spillage; properly identified passageways; unobstructed accesses and exits; neat and orderly machinery and equipment; well-nested hoses and cords; properly stored materials; removal of excess waste material or debris from the working area; walkways free from ice and snow; surfaces, including elevated locations, free from accumulated dust; and adequate lighting. Maintaining these conditions contributes significantly to lower incident rates.

While **OSHA Regulations** require that each working surface be cleared of debris, including solid and liquid waste, at the end of each work shift or job, whichever occurs first, to fully realize the benefit of a clean workplace, it is recommended that good housekeeping be maintained throughout the course of the job and workday.

PROVISIONS CONTAINED IN 29 CFR 1915.81 OUTLINE OSHA’S MINIMUM HOUSEKEEPING REQUIREMENTS TO PROTECT WORKERS. EMPLOYERS MUST:

1. Establish and maintain good housekeeping practices.
2. Eliminate slippery conditions, such as snow, ice, and grease, from walkways and working surfaces as necessary. Where removal is not possible, access to such areas must be restricted and an alternate route established, or slip-resistant footwear provided.
3. Store materials in a way that does not create hazards for workers.
4. Ensure easy and open access to all exits (including ladders, staircases, scaffolds, and gangways), fire-alarm boxes, fire extinguishing equipment and fire call stations.
5. Dispose of oils, paint thinners, solvents, rags, scraps, waste, or other flammable and combustible substances, or store them in covered fire-resistant containers, at the end of each work shift or when the job is complete, whichever occurs first.
6. Maintain walkways so that they provide adequate passage and are:

- Free from debris, including solid and liquid waste;

- Clear of tools, materials, equipment, and other objects; and
- Free from trip hazards as a result of the improper storage or placement of hoses and electrical service cords. Hoses and cords must be placed above or underneath walkways or covered.

7. Cordon off any portion of a walkway that is being used as a working surface.
8. Make sure working surfaces are free from all tools, materials, and equipment not necessary to perform the job in progress. All debris, including liquid and solid waste, must be cleared at the end of the job or work shift, whichever occurs first.
9. Keep working surfaces dry, when possible. If a wet process is used, drainage must be maintained and dry standing places made available, or workers provided with protective footgear when such means are not practicable.

STATISTICS

The Bureau of Labor Statistics (2015) revealed that out of 120 workplace deaths in the **mining, oil and gas extraction industry**, 74 of them occurred within the support activities for **oil and gas operations.**

The constant pressure of efficient productivity due to the high cost of drilling projects, time away from home, long work days, and high physical demands takes a hefty toll on workers. These factors can ultimately affect worker safety.

Workers are susceptible to motor vehicle accidents, contact injuries, slips, trips, and falls and encounter fires, explosions, chemical exposure, and confined space issues.

One study puts office accidents at 40,000 accidents a year!!! An office: One wouldn’t think that an office is a dangerous place to work. Good housekeeping at work can perform magic to keep you safe from slips, trips, falls and fires.

Dust explosions, like the tragedy at the Hoeganaes Plant in Tennessee, have been linked to poor housekeeping. **More than 100 workers lives were claimed and injured more than 600 according to the U.S. Chemical Safety and Hazard Investigation Board.**

RECOMMENDATIONS

Policies to consider:

- Institute a routine cleaning schedule.
- Hold everyone in the workplace accountable for housekeeping.
- Keep walkways free of debris, cords, cables and storage items.
- Clean up oil, water and grease on floors immediately.
- Train all employees on the proper disposal of combustible and flammable materials.
- Provide nonskid strips or floor mats in slippery or wet areas and ensure they are kept in good condition (no curls or frayed edges).
- Ensure that workers wear proper footwear for their work environment.
- Encourage employees to inform you immediately of any potential safety

hazards and accidents, with or without injuries. Implement corrective measures immediately.

PREVENTION

Careful consideration must be given to the volume of materials to be handled, the space needed for these materials and the methods of handling and transportation.

Piling materials

When piling materials, keep these points in mind:

- Height of pile – hazards include toppling, nearby traffic and interference with sprinkler systems.
- Strength of support – allowable floor loads should be posted.
- Continued stability – related to yard piling where uneven or moist ground may cause toppling.
- Location – aisle traffic or machinery may make it necessary to limit the height or type of materials.
- Pipe or long stock – racks aid handling, but projecting ends should be protected by railings or barriers.
- Mechanical aids – employing manual methods instead of utilizing stackers or hoists is a common fault.

Tool housekeeping

Racks and holders should be provided for all hand tools, jigs, cutters, blades and other parts. Tools frequently used at a bench or machine should be placed on racks. Wheeled racks are often very helpful.

Scrap and waste disposal

The old way of letting it fall to the floor and cleaning it up periodically is not conducive to safety. A suitable means of collecting and disposing of waste in a timely manner is recommended.

Marking storage space

Clearly marking aisles and spaces reserved for storage will solve a lot of problems in the workplace.

Leaks, drips and spillage

Use oil pans, splash guards and drip pans to keep oil off the floor. Proper means of oiling and good maintenance reduce dripping, and good construction reduces leaks.

Aisle layout

Aisles too narrow for safety are also too narrow for efficiency. Aisles accommodating powered truck traffic should be three feet wider than twice the

width of the trucks used.

Machinery and equipment layout

The provision of adequate space and the proper arrangement of various production units are vital to housekeeping.

A common mistake is to add machines to well-filled floor space. This not only increases the accident hazard but often decreases efficiency because of overcrowding.

Important housekeeping tips

1. When you are finished using tools or material, return them to their proper place and clean up anything that is left sitting on work surfaces or floors.
2. If you observe materials protruding from shelving that could either fall onto workers or injure anyone walking by, push them back or if they are too large to handle or cannot be repositioned so they fit on the shelf, report them to your supervisor.
3. Ensure that all walkways are free of obstructions such as materials, tools, or wires that could cause someone to trip or fall.
4. Never stack material to a height where it becomes unstable and might fall.
5. If emergency exit routes are blocked by material, inform your supervisor.
6. Don’t leave garbage hanging around. Trash should be taken to a dumpster at the end of the shift.
7. Dispose of oily rags in covered metal containers. These containers need to be emptied on a regular basis.
8. Ensure that fire extinguishers and sprinkler systems are not blocked by equipment or materials.

“Good Housekeeping” must be practiced day-by-day.

Good Housekeeping Benefits

9. Reduce drilling costs.
10. Increase hole drilled.
11. Improve control of drilling.
12. Conserve materials and parts.
13. Decrease rig down time.
14. Use space more efficiently.
15. Open access routes and enable better movement.
16. Lower incident rates on the rig.
17. Build higher crew morale.
18. Reduce rig fire hazards

Housekeeping Practices:

- Put a tool back in the rack when you are finished using it.
- Sweep up or wash off any dirt or mud as soon as you can.
- Repair those loose steps, rickety handrails (check the base sockets and welds) and loose walkways.
- Keep cables, slings, chains, rope (catline), etc. coiled up and off the floor when not in use.
- Do not allow oil to collect on the rig floor or in the cellar.

- Do not block fire extinguishers.
- Do not block emergency exit routes.
- Keep the BOPs and cellar washed down and keep cellars jetted down.
- Keep all trash and miscellaneous parts from under sub-structure.
- Keep all excess pipe, connections etc., in a rack, not under or spread around the rig.
- Keep the water hose clean and coiled up, when not in use.
- Keep the water hose such that it cannot reach the kelly (kelly bushings).
- See that all fire extinguishing equipment is in the clear and ready for use.
- See that first aid kits and supplies are clean, filled and ready for use.
- Check all safety equipment (hard hats, shoes, goggles, gloves, gas masks, etc.) and ensure that they are clean and in good repair.

Safety Check List

Slips / Falls:

Slips can be caused by spilled liquids or improper maintenance. Are the floors clean and free of ice, mud, water or coffee spills? Do you wipe up small messes immediately and report larger ones to the maintenance department?

Trash:

Trash can also be a source of slips and falls as well as fires. Do you place all of your trash in your waste-paper basket or recycling container?

Fire hazards:

Speaking of fire hazards, if you smoke do so only in the assigned areas. Do you use a

designated covered metal can for emptying ashtrays? This is one type of trash which should never be placed in a waste-paper basket.

Electric cords:

Abused electrical cords can be another source of fire. Are the electrical cords for your printers, computers, monitors, fax machines and photocopiers in good condition? Inspect yours regularly and report any cords which appear to be worn, broken or lacking pieces of insulation.

While you are looking at the condition of your electrical cords, consider whether they are a tripping hazard as well. Are they routed away from traffic areas? Perhaps you may have to consider changing the office equipment layout to prevent people from walking on or over the electrical cords.

Tripping Hazards:

Do you keep your work and traffic areas free of tripping hazards for co-workers? Old files, such as the month and year-end reports, should be stored in proper boxes and moved to a central storage area.

Other tripping hazards are loose, worn or frayed carpets and unsecure small rugs or mats. Do you regularly report any problems to your supervisor or the maintenance staff?

Office furniture:

Is the office furniture kept in good repair to maintain safety? Defective furniture such as chairs should be removed from service immediately.

Flammable materials:

Flammable liquids such as solvents and art supplies should be stored in approved containers which are kept closed. They should be kept in areas with adequate ventilation and away from any possible sources of ignition.

Combustible materials:

Do you keep combustible substances, such as paper and cardboard, away from heat sources such as electrical heaters? Paper being saved for recycling should be picked up regularly so that it does not accumulate and present a fire hazard.

Exits:

Make sure that fire exits remain clear. Never place furniture or supplies in front of a fire exit – even just temporarily.

Fire doors:

Fire doors, which are designed to slow the spread of fire, should be kept closed as directed. Never prop open a fire door just to facilitate traffic or to let in a breeze.

The possibilities for injury or death in a cluttered workplace are many. Workers can slip on spilled material that hasn't been cleaned up, trip over debris on a floor, hurt themselves while walking past heavy or sharp objects that are protruding from shelves or be struck by unsecured items that shift and fall from racking.

If sawdust, sugar or other material is left to accumulate on surfaces and it comes in contact with an ignition source, it can cause a deadly explosion and fire.

It is neither safe nor practical for you to sweep dust off a beam high in the air in your workplace. If you are concerned about a buildup of combustible dust and the potential for an explosion, talk to your supervisor.

As a worker, there's plenty you can do on the ground to keep yourself and your co-workers safe. While it can be annoying to see someone create a mess such as a spill and walk away from it, ignoring that mess yourself is wrong because it puts everyone in danger.

The few seconds it takes to mop up a coffee spill on the floor or sweep up some wood chips and sawdust can make a huge difference to the safety of your workplace. But if you don't know what the spilled material is, talk to your supervisor before attempting to clean it up.