Grain Handling Safety Meeting Kit

WHAT’S AT STAKE

GRAIN HANDLING FACILITIES

Grain handling facilities are facilities that may receive, handle, store, process and ship bulk raw agricultual commodities such as (but not limited to) corn, wheat, oats, barley, sunflower seeds, and soybeans. Grain handling facilities include grain elevators, feed mills, flour mills, rice mills, dust pelletizing plants, dry corn mills, facilities with soybean flaking operations, and facilities with dry grinding operations of soycake.

WHAT’S THE DANGER

ENGULFMENT AND ENTANGLEMENT

Flowing grain is the number one cause of fatalities for grain handlers. When in large or unstable quantities, grain can flow like water. If you are caught in a grain flow, you can be buried in 15-to-60 seconds. Unlike water, which allows you to swim, it is difficult or impossible to move if you are caught in grain. You can suffocate or “drown” in grain.

Entanglement in grain handling machinery is the second leading cause of grain handler fatalities. Moving fans, blades, augers, power take-offs (PTOs), belts, gears, and pulleys can severely injure, disfigure, amputate, or cause death to unwary workers. Automatic equipment can come on suddenly and without warning.

POTENTIAL GRAIN HANDLING SAFETY HAZARDS

It’s essential to know some of the common hazards – and incorporate grain handling safety standards to avoid them. Here are a few of the primary dangers and hazards.

Dust Accumulations. Dust accumulations are a significant hazard when it comes to grain bin safety. With such high quantities of organic material around, it’s easy for these goods to release large amounts of dust, which accumulates in the atmosphere. Airborne dust particles can make breathing difficult, along with chemicals or fumes from spoiled grain.

Explosions. Explosions can occur when gathered dust comes into contact with heated elements, such as grinding equipment or overheated motors. Because of the dust’s highly flammable nature, this combination makes a deadly mix, often resulting in a severe explosion. These combustion events can occur with both airborne and accumulated dust, which is why workers should avoid doing “hot work” in dust-filled environments. Hot work includes actions such as welding and brazing.

Hazardous Atmospheres. Pest prevention is a major concern for people who store and ship grain, which is why many businesses use insecticides to deter these critters. However, these chemicals can pose a health hazard to the employees working with grain bins. Similarly, spoiled grains can release mold spores or gases that are detrimental to respiratory health. When grain is wet, it ferments and releases carbon dioxide, which lowers the oxygen level inside a bin and causes dizziness or shortness of breath.

HOW TO PROTECT YOURSELF

Grain Bin Safety Checklist – Steps To Take To Ensure Worker Safety

1. Perform Preventative Maintenance. Facilities should conduct regular inspections for heat-producing devices like bearings and motors, which can become catalysts for dust explosions. You may

employ heat detection strategies to identify potential problem areas and remedy them before they cause an accident. Machine wiring also requires a thorough inspection, and grain storage facilities should possess electrical systems suited for dangerous work.

2. Equip the Bins for Safety. All grain bins should have labels warning of the possibility of flowing grain. Workers should be aware that even vertical stacks of grain can prove dangerous if they topple over. Additional signs should outline best practices and safety tips for grain handling, like following lockout procedures.

Inform the fire department or your local emergency services crew of the situation. If the individual is seriously injured or distressed, they may need breathing assistance and other life-saving measures once they're free.

3. Cut Openings or Build a Retaining Wall. If the person is completely submerged, cut V-shaped openings on opposite sides of the grain bin. Cutting holes allows the grain to flow out without the danger of auger entanglement. Be sure to space the openings on either side evenly or else you risk causing the bin to collapse.

If the individual is partially submerged, create a retaining wall around them using sheet metal, plywood or a large tube or drum to prevent more grain from covering them. Remove the grain from the inside of this area by scooping or vacuuming it out. You may also be able to free the person by lowering a rescuer into the bin so they can attach a harness.

4. Give Assistance. Emergency service members can provide additional assistance once the person is free, whether this means transporting them to a nearby hospital or giving emotional support. If the bin's atmosphere is oxygen-deficient at the time of entrapment, allow the emergency crew to perform the entirety of the rescue mission. They're professionally equipped to handle such situations.

5. Follow Lockout-Tag-Out Procedures. Employees should turn off,

lock and tag all equipment attached to the grain bin before allowing workers to enter. Doing this avoids entanglement with moving parts or engulfment from moving grain. Safety systems for various storage facilities may differ slightly, but it’s advisable to keep a record of every employee who enters. Include what the reason for entering is and on what date entry occurred. Additionally, be sure to remove all tools or equipment in the bin before unlocking machinery.

6. Test the Air. Before anyone enters a grain bin, they should perform an oxygen level test to ensure dangerous amounts of CO2 aren’t present. The same goes for other toxic air pollutants, like fumigants or mold spores. Even if the air is safe, employees should wear masks to avoid breathing in fine dust.

Ventilation systems are a standard component of many grain bins. These facilitate healthy airflow and release gases that can make the inside atmosphere dangerous. Standard bins contain multiple ventilation fans and roof vents to bring in clean air and cycle out contaminants.

7. Use Personal Protective Equipment. Whenever a worker must enter a grain bin, they must wear the proper personal protective equipment (PPE) to avoid full or partial engulfment. This includes a body harness and lifeline or a boatswain’s chair. Earmuffs and other forms of hearing protection are necessary around machinery like grain dryers, as these can be incredibly loud.

FINAL WORD

Grain, feed, and other agricultural material storage is necessary, but handling these materials can pose a risk of engulfment, dangerous atmospheres, and contact with moving machinery to workers. Get training in grain hazards and confined spaces, lockout/tagout (LOTO) and respiratory protection. Be familiar with the equipment that you will drive and operate.