

Training Module: Grain Bin Hazards

Objective: To recognize, avoid and control potential grain bin hazards.

Trainer's Note: This module introduces the hazards of working with flowing grain. Pretest employees' knowledge using the true/false questions from the end of the module. Review the answers, emphasizing the recognition, avoidance and control of hazards.

Background

Recognizing the hazard:

- **Respiratory Hazard:** - Dust from grain can affect people in a variety of ways. While some may not be bothered, others suffer from dust induced breathing, digestion and stomach problems and/or skin rashes.

To help reduce and prevent allergic reactions, workers should wear proper protective gear and/or avoid dusty areas. Ventilate fumigated bins for several hours, or longer if recommended by the pesticide manufacturer or the EPA before reentering. Upon entry, wear a respirator suitable for protection from dust. Unless a known chemical is present, then wear the proper respirator for that situation. For example, if the grain is moldy, then a HEPA (High Efficiency Filter) cartridge will be needed for your respirator.

- **Fire and Explosion Hazards:** An build up of grain dust can be ignited by a heat source such as fire, sparks, or hot bearings. When contained dust is mixed with air, an explosion can occur.

To reduce the possibility of a fire or explosion:

- Never weld or grind in a bin containing grain
 - **“NO SMOKING”** signs should be posted in key locations and strictly enforced.
 - Perform routine maintenance to reduce risk of ignition due to machinery failure.
- **Housekeeping:** Housekeeping and fire guidelines should be outlined in a written “Standard Operating Procedure “. It should include instructions for reducing dust accumulations. A maximum accumulation of 1/8-inch of grain dust is allowed in priority housekeeping areas.

Defective wiring or any sparking should be reported to the supervisor immediately. Identify potential sources of ignition in grain elevators. Some common sources of ignition are:

- Floor areas within 35 feet of the inside of bucket elevator legs.
- Enclosed areas containing grinding equipment.
- Enclosed areas containing grain dryers located inside the facility.

The Standard Operating Procedure should also include methods for removing grain spills from work areas. All employees should know the procedure.

Avoiding or Reducing the Hazard:

“Flowing grain” is the term used to describe the down and outward movement of grain from a storage bin. A funnel is formed and the grain flows toward the bottom center of the cone, causing quicksand like suction. If pulled under the surface suffocation will likely occur. In three to four seconds, grain can be above knee level, making the window of safe recovery very narrow.



Never enter a grain bin when grain is being removed. Only enter when the power is off and locked out on the unloading conveyor or auger. (Refer to module on Lockout/Tagout)

Always use a safety harness, safety line, and have at least two observers during bin entry.

Place warning decals on all bin entrances and gravity wagons.

Controlling the Hazard:

- Shielding and Guarding - By preventing the accidental engagement of machinery, guards and safety switches on automatic equipment can save the life of someone working on or in a bin
- Rescue Plans - Employees working with grain bins should be aware of the rescue plan.

A written emergency plan containing information on the alarm system and evacuation procedures (including a safe meeting place), should be developed and implemented in units of 10 or more workers. .

Review The Following Points

- Grain dust affects people's health differently.
- Wear self-contained or air supplied breathing apparatus when entering bins.
- The “NO SMOKING” rule must be strictly enforced around grain bins.
- Nobody should enter a bin while grain is being removed.
- A written Standard Operating Procedure should be in place and employees should be responsible for knowing the procedure.

True or False Answer Key

1. F, 2. F, 3. T, 4. F, 5. F

Grain Bin Hazards Quiz

True or False

Name _____

- | | | |
|---|---|---|
| 1. After evacuation of a grain-handeling facility, it is a good idea for employees to go straight home. | T | F |
| 2. Rescue plans should only be known by the employer. | T | F |
| 3. Employees should know the common sources of ignition. | T | F |
| 4. Dust is not a health concern in grain bins. | T | F |
| 5. Anyone can enter a bin while grain is being removed. | T | F |