Silo Storage Safety Stats and Facts

FACTS

Silo Hazards

1. Silos contain deadly gases like nitrogen dioxide (NO2) and carbon dioxide (CO2).
   - NO2 is heavier than air and may be seen as a reddish to yellowish-brown haze. Since it is heavier than air, it can be found near the base of a recently filled silo. It has a bleach-like smell, and you will experience a burning sensation in your nose, throat, and chest. Instant death may be a result of nitrogen dioxide inhalation.
   - CO2 on the other hand, fills the headspace of the silo, replacing the air. Exposure to these two gases happens most often in the first three weeks after the silo is filled. Due to this risk of exposure, it is suggested that you stay out of the silo for the first three weeks, unless wearing a self-contained breathing apparatus.

1. Causes of Grain Bin Entrapment
   - Grain handlers do not follow proper safety procedures.
   - Grain handlers are without personal protective equipment.
   - Grain handlers enter bins or silos while grain was flowing, and equipment was running and were sucked under the grain. If a grain-probe or shovel is dropped in grain bin, the flow of grain should stop first before taking any action to retrieve the lost item.
   - Grain handlers fell through bridged grain into an air pocket that was formed beneath spoiled grain.
   - Grain handlers tried to break a vertical grain wall.

STATS

- The number of reported grain entrapments across the country rose by 27% from 2018 to 2019, and deaths rose by 53% that year.
- Grain entrapments and fatalities have risen. In 2017, 23 grain entrapments and 12 deaths were recorded; in 2018, 30 grain entrapments and 15 deaths were recorded; and in 2019, 38 grain entrapments led to 23 deaths. Total grain entrapments rose by 65% over that 3-year period.
- The Department of Labor (DOL) reports that it only takes five seconds for a worker to become engulfed in flowing grain and only sixty seconds to become completely submerged. Over half of all these accidents result in fatality due to suffocation; over 900 grain bin fatalities in the U.S. have been reported in the last fifty years.
- In 2018, the state with the most documented grain entrapments, was Iowa with five cases total, followed by Kansas and Wisconsin, each with three.
- The majority of grain entrapment cases – 83% – occurred in the Midwest.
- Grain entrapments accounted for 49% of the documented cases of entrapments in confined spaces.
- The entire body of a 6-foot-tall person can be completely engulfed within grain in about 30 seconds. Without immediate rescue, this person will suffocate.