



NGFA Safety Tips: Bulk Material Storage and Handling

...Committed to promoting safety and health in the workplace...

By Jim Seibert, NGFA Manager of Training, Education and Regulatory Affairs

Bulk Material Handling Practices

Bulk grain is stored in a variety of ways once permanent storage space is full, including bunkers, flat storage and emergency ground piles. The focus of this flyer is on flat storage, since many of the practices within and around flat storage also can be applied directly to the aforementioned types of non-permanent storage.



The OSHA Grain Handling Standard [1910.272(h)] provides regulations for entry into flat storage structures:

1910.272 (h)(1): If an employee walks or stands on or in stored grain, where the depth poses a hazard of engulfment, the employee is required to be equipped with a lifeline or alternative means which, demonstrated by the employer, limits the employee from sinking further than waist-deep. [**Note to (h)(1): If the employer can demonstrate that there are no engulfment hazards (i.e. no reclaim present or natural angle of repose), the lifeline or alternative means may be disconnected or removed.*]

1910.272 (h)(2) and (i): If an employee walks or stands on or in stored grain, where the depth poses a hazard of engulfment, all equipment that could pose a hazard to the employee (auger, conveyor, or other grain transportation systems) is to be deenergized, disconnected, locked-out and tagged, blocked off, or otherwise prevented from operating by other equally effective means.

1910.272 (g)(1)(iv): States that “walking down grain” and/or other similar practices to assist the flow of grain is prohibited. According to **1910.272(g)(6)**, no employee is permitted to stand either underneath bridged grain or in any other location where accumulation of grain (cliffing) could fall and engulf an employee.

Hazards associated with Bulk Material Storage and Handling Procedures:

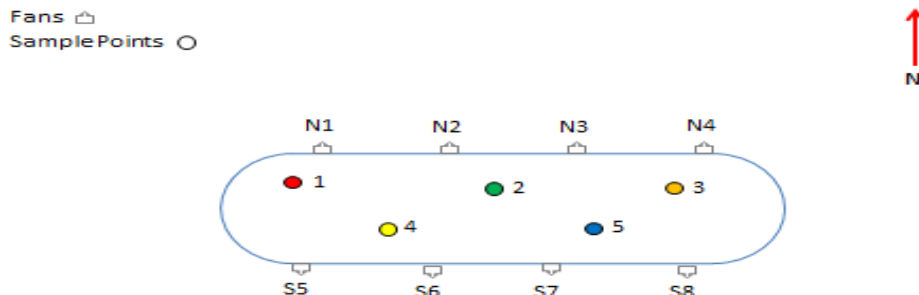
- Consider what equipment should be locked out, if any.
- Monitor the grain and ensure that it is not cliffed beyond the natural angle of repose, which could mean it is out of condition.

- The NGFA is committed to promoting safety and health in the workplace, and shares the Occupational Safety and Health Administration’s (OSHA’s) commitment to protecting employees.
- The NGFA’s extensive efforts to enhance safety include unprecedented research and education efforts launched in the early 1980s that helped lead to a dramatic reduction in the number of fire and explosion incidents in commercial grain-handling facilities.
- Each year, NGFA jointly sponsors regional safety seminars with affiliated state and regional grain and feed associations. The one-day conferences focus on keeping grain handling employees physically safe.

- Foot traffic from truckers, farmers or employees should be limited while mobile equipment is operating. Use of a safety work zone with a visual and physical barrier is a recommended precaution.
- During tarping procedures, special precautions should be taken as this process itself can create some additional hazards which should be discussed and planned for prior to the task.

Common Storage and Sampling Practices

If the length of time needed to retain a pile is unknown, it's a good practice to create a benchmark of grades, CO2 readings and presence of mold. When setting your sample schedule, plan on taking one deep probe for every 200,000 bushels in a uniform pattern across the pile. Good recordkeeping is imperative to notice a change of condition in the pile. The sampling locations should be kept consistent throughout the testing period and repeated every two weeks.



SAMPLE POINT 1							
Date of Sample	TW	M	FM	DMG	CO2	Grn Temp	
11/20/2016	60.2	15.7	0.87	1	427	54.3	
12/4/2016							
12/18/2016							

Consistent Sampling will show the effectiveness of aeration management through moisture loss. Taking samples every two weeks gives the employee an opportunity to walk the pile and note changes. Depending upon crop growing conditions and projected duration of storage, it is suggested that the collected samples be tested for the potential presence of *Aspergillus Glaucus*, *Aspergillus Flavus*, *Penicillium* and *Fusarium*. The presence of these molds can increase allergens and/or mycotoxins in stored grain.

CO2 and Temperature sampling can create a picture of the current grain condition for the merchandiser to act upon. Watch for steady increases or large jumps in the CO2 readings. If the grain was stored between 15-20 percent moisture and higher temperatures existed during the prime growing season and through harvest, there is potential for mold activity to increase, which would lead to higher CO2 readings.

Disclaimer: The National Grain and Feed Association make no warranties, expressed or implied, concerning the accuracy, application or use of the information contained in this publication. Further, nothing contained herein is intended as legal notice. Competent legal counsel should be consulted on legal issues. Grain handling facilities should contact experienced safety and health legal counsel or a third-party expert if they have questions about the proper way to implement the items addressed in the document.

More safety information at www.ngfa.org

Contact VP Safety and Regulatory Affairs Jess McCluer or Manager of Training, Education and Regulatory Affairs Jim Seibert at 202-289-0873

NGFA Reference Corner

University of Minnesota – Grain Storage Management with Aeration

[CLICK HERE](#)

OSHA Grain Handling Standard 29 CFR 1910.272(h)

[CLICK HERE](#)

OSHA LockOut/TagOut 29 CFR 1910.147

[CLICK HERE](#)

OSHA Emergency Action Plan 29 CFR 1910.38

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