Why Get Excited?

THE REASONS GRAIN ENGULFMENT SHOULD GET TOP PRIORITY FOR GRAIN HANDLERS

It has been pointed out to me that we lose more farmers from tractor rollovers than grain engulfment. It also is true that we lose many more people due to heart attacks, vehicle accidents, cancer, and numerous other cases than we do from grain engulfments. So why should we get excited?

When looking at improving safety programs, I like to focus on the real threats in our facilities, not the perceived threats that OSHA tends to do. OSHA likes to cite people frequently for HazCom and lockout/tagout issues, but these issues are not responsible for that many deaths in off-farm, commercial grain handling facilities. Why shouldn’t we focus on the greatest threat to our employees?

Dust Explosions

In the 1970s and 1980s, our grain industry spent a great deal of time and resources getting the threat from dust explosions under control. We had 54 fatalities from dust explosions in the 10-year period of 1978-87, for an average of 5.4 deaths per year.

We managed to reduce this number to 15 fatalities from dust explosions in the 10-year period of 1990-99, for a much lower average of 1.5 deaths per year. This trend line still is dropping for the grain industry, thanks to new consensus standards for housekeeping, hazard monitoring equipment, dust collection and suppression systems, and new design parameters.

The threat from dust explosions got a lot more people in our industry excited between 1970 and 1985 than grain entrapments do today.
I suspect some of this was due to the fact that blowing a headhouse apart and scattering chunks of concrete hundreds of feet from the facility made the CNN news across the country.

Also, having millions of dollars in property damage got the attention of board rooms and insurance underwriters. Sadly to say, unless the man who died by himself in a grain bin is related to you or works for you, the grain entrapment incident likely will not have much of an impact on most people.

These are some of the facts, as I see them. See the accompanying charts for more detail.

**Leader in Fatalities**

The grain industry is averaging over 6.6 deaths per year during the past six years around commercial facilities alone, as a result of grain entrapments. This number likely will be even higher in 2010 due to the size and condition of the 2009 crop. This is far higher than the numbers we experienced from dust explosions between 1978 and 2010.

**Soaring Production**

Corn production in the United States averaged 12.75 billion bushels for the three-year period 2007-09 and peaked at 13.13 billion bushels in 2009. So, it is to be expected that states with the highest storage capacity, along with the greatest levels of corn production, also will have the highest grain entrapment numbers.

**Corn the Most Dangerous**

According to Bill Fields and Matt Roberts at Purdue University, entrapments have been documented in a number of commodities. However, 45% of known entrapments involve corn. In most cases, out-of-condition grain was involved as a contributing cause.

Other commodities included soybeans, wheat, sorghum, processed feed, soybean meal, and others.

**Improved Chances for Survival**

Deaths as a percentage of total entrapments is decreasing. This likely is due to a number of factors.

- People are reporting a higher percentage of the entrapments actually happening. Indiana has been reporting a much higher percentage of the actual entrapments since 1964, thanks to the attention that Purdue University has been providing in that state for over 40 years on...
this topic. The rest of the industry is more likely to report these types of incidents correctly today than it was 20 or 30 years ago. Numbers reported were 38 in 2009, 34 in 2008, 33 in 2007, and 20 in 2006. Purdue indicated a high of 42 entrapments reported in 1993.

- The industry is better educated due to the awareness level training that has been offered by key companies in the past 5-7 years. Unfortunately, most companies still do not offer annual hands-on training, as they should. However, the grain industry and local firefighters have a better idea of what their options are to save a victim who is entrapped today than they did 20 years ago.

- The industry has far more cofferdams on-site and available, along with other restraining wall materials, to aid in a rescue.

For the reasons above, we are seeing the number of reported entrapments that result in death decrease over time from an average of 74% between 1964 and 2005 to less than 45% today, according to Purdue. The percentage was 42% in 2009 and 47% in 2007.

### Capacity Increase

Total storage capacity in the United States and the size of storage bins are increasing. The total storage capacity numbers for on-farm and off-farm combined exceeded 22 billion bushels in the period 1987-89. This combined storage number dropped to about 19 billion bushels in 1997-99 but has been inching higher again in the past three to five years due to increased corn production, the growth of the ethanol industry, and other issues.

The size of commercial steel tanks jumped to 105 feet in diameter in the mid-1990s, and today we see diameters up to 156 feet being built. Handling capacities also have increased. A 4-6-inch farm auger and handling capacities of 4,000 to 6,000 bph in off-farm facilities were common 20 years ago. That is not the case today.

Unfortunately, we have not increased the size, safety, or handling efficiencies of reclaim systems to keep pace with the size of bins and loading capacities.

OSHA has gotten everyone’s attention with its latest letter of interpretation regarding entry into bins when sweep augers are in operation. Unfortunately, it is not practical or cost-effective to retrofit reclaim systems in bins that are 10 to 25 years old.

However, if we intend to get serious about “zero entry mentality” and discouraging people from entry into grain bins, we need to improve the design and safety features of reclaim systems that will be built into bins after 2011. We need to have a paradigm shift in this area.

---

Off-Farm Storage Numbers (as of 2005):

<table>
<thead>
<tr>
<th>State</th>
<th>Storage (million bu.)</th>
<th>Number of Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois</td>
<td>1,157</td>
<td>950</td>
</tr>
<tr>
<td>Iowa</td>
<td>1,055</td>
<td>920</td>
</tr>
<tr>
<td>Kansas</td>
<td>890</td>
<td>790</td>
</tr>
<tr>
<td>Nebraska</td>
<td>691</td>
<td>494</td>
</tr>
<tr>
<td>Texas</td>
<td>640</td>
<td>450</td>
</tr>
</tbody>
</table>

---

If we don’t get more serious about adopting new consensus standards in (bin entry) like we did for dust explosions in the 1980s and 1990s, OSHA will formulate new standards and expectations for us.
Deaths from Dust Explosions
1978-87 . . 54 for average of 5.4/year
1990-99 . . 15 for average of 1.5/year

Deaths from Grain Entrapments in Off-Farm Facilities
2004-09 . . 40 for average of 6.6/year

Total Grain Entrapments Reported (Farm & Off-Farm)
2009 . . . 38
2008 . . . 34
2007 . . . 33
2006 . . . 20

Deaths in Commercial Facilities from Grain Entrapments
2000-04 . . 20
2005-09 . . 34

A Serious Approach
In short, we need to get excited about the increasing numbers of people dying in grain bins.
If we don’t get more serious about adopting new consensus standards in this area like we did for dust explosions in the 1980s and 1990s, OSHA will formulate new standards and expectations for us.
So, do you wish to try to deal with this as an industry, with new best management practices that we come up with and adopt, or do you want to wait and try to comply with whatever OSHA comes up with for us?
The decision is ours. Someone is going to draft new standards for us in the near future. Either we can do it now, or OSHA will do it for us later. If you choose not to get involved, don’t complain with whatever OSHA comes up with for you later.

Getting Involved
The next Grain Entrapment Prevention Committee meetings will be held:
• In Indianapolis, IN in December during the National Grain and Feed Association’s Country Elevator Council meeting.
• In Portland, OR during GEAPS Exchange 2011 next Feb. 27-March 2.
Please consider joining us. We need your input and support.
Wayne Bauer is safety and security director of Star of the West Milling Co., Frankenmuth, MI; 989-652-7026.

Zero Speed Switches
PROTECT CONVEYOR BELTS
• Monitors Operating Speed
• Detects Belt Stretch and/or Mechanical Failure
• Prevents Overloading, Jamming, and Downtime

The Altra-gap Sensor

North American Equipment Co.
800-514-7608 • Nortonville, KS
www.naequipment.net

Response No. 791