

**National Grain  
and Feed Association**

# **Dust Explosions, Dryer Fires, and Emergency Responders**

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National Grain and Feed Association

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**Feed & Grain** **LIVE**  
FREE WEBINAR SERIES



# Sponsor





# Agenda

- Planning and Prevention Techniques for Dust Explosions
- Grain Dryer Fire Prevention
- Interaction with Emergency Responders



# Learning Objectives

At the end of this session, participants will be able to:

- Explain mitigation techniques to reduce the potential for dust explosions.
- Describe measures for preventing grain dryer fires.
- Better interact with emergency responders and incident command.



# Planning & Prevention Techniques for Dust Explosions



# Dust Explosions



## 2020

- 8 Grain dust explosions
- 0 fatalities, 9 injuries
- Explosions were in 1 feed mill, 3 grain processing mills, 4 grain elevators
- Probable ignition sources; 1 case as fire, 2 as hot bearings, 5 unknowns

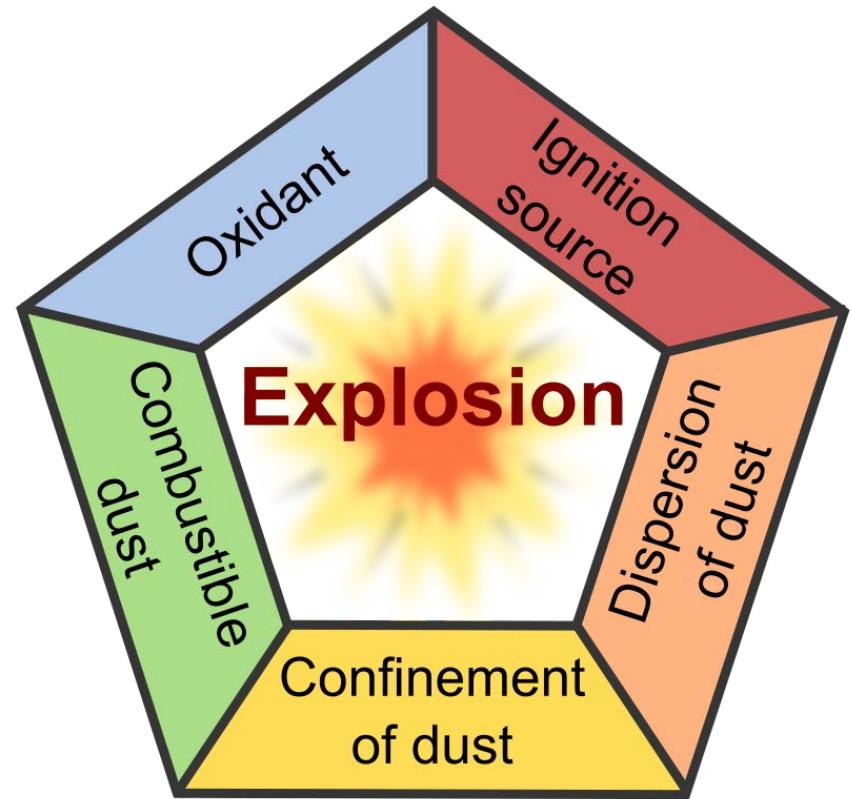
# Our Influence on Explosions

There are only 2 explosion components we can influence & effectively control



Ignition source

Fuel/grain dust



# Housekeeping

## Grain Handling Standard 1910.272(j) requires Housekeeping plan:

### Plan Components:

- Written instructions
- Frequency of inspections
- Frequency of cleaning
- Methods of cleaning
- Spills and leaks
- Dust control equipment



Establishes frequency & methods



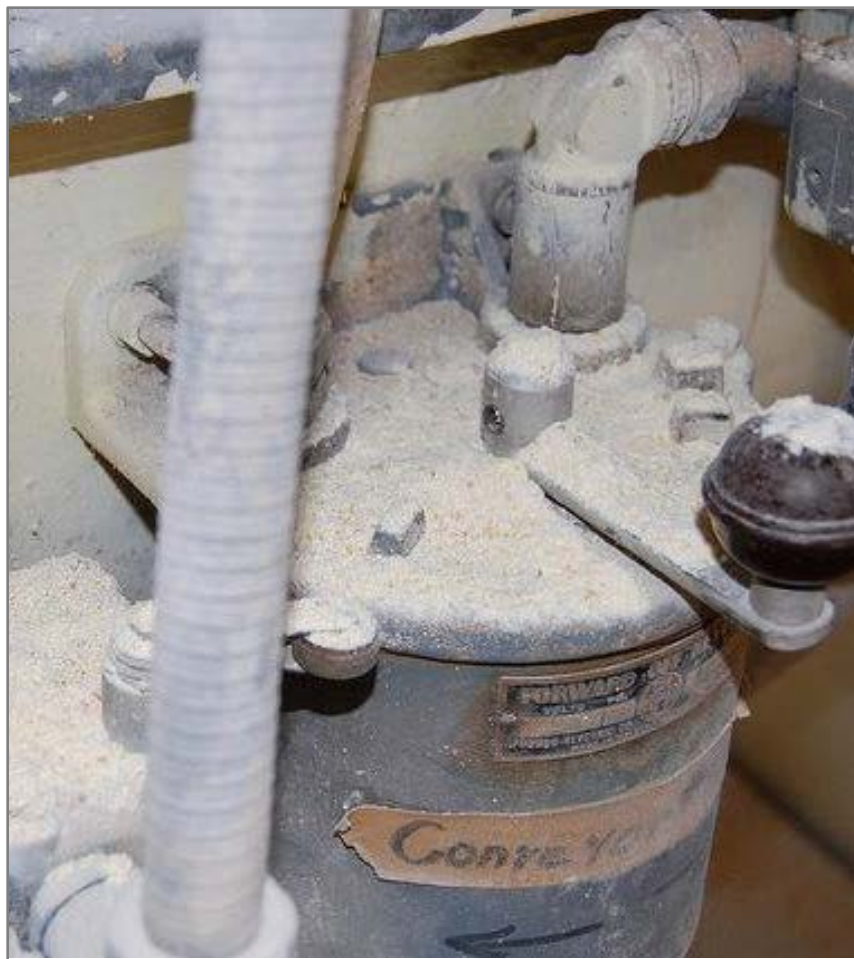
Best reduces accumulations of fugitive grain dust



For ledges, floors, equipment, other exposed surfaces



# Housekeeping - Identify



# Housekeeping - Address

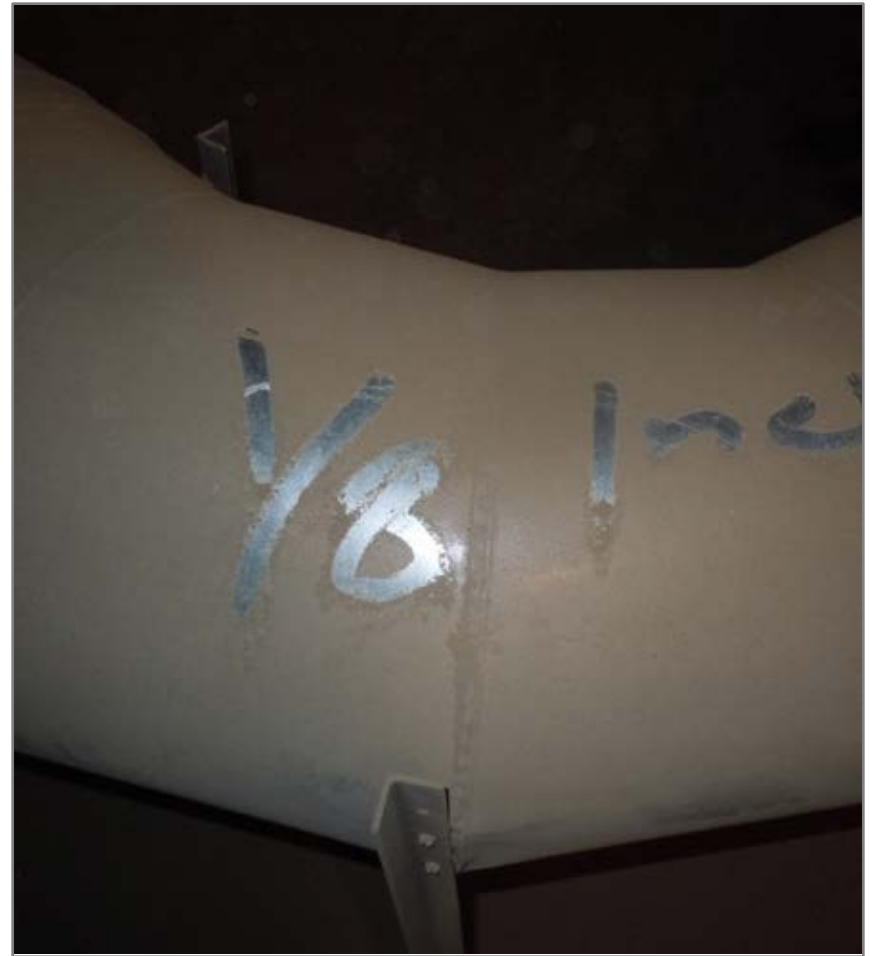




# Housekeeping - Clean



# Housekeeping - Report



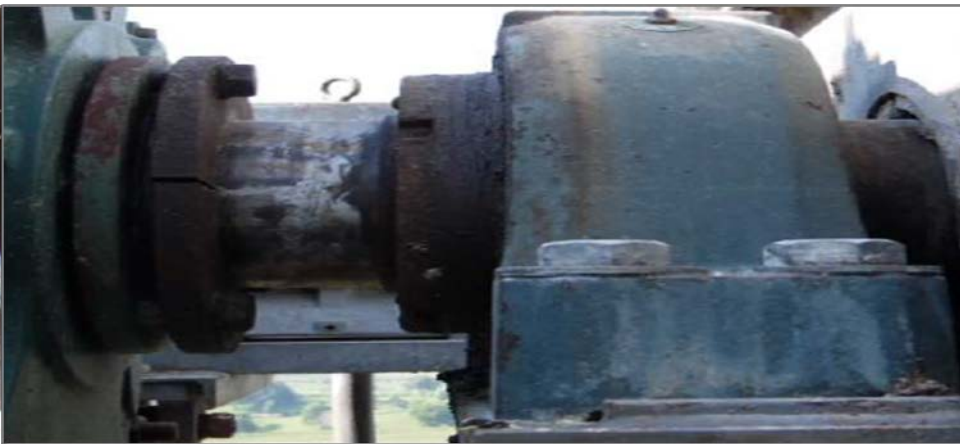


# Preventive Maintenance Program

- Regular, scheduled inspections - mechanical & safety control equipment:
  - Grain Stream Processing Equipment
  - Filter Collectors
  - Bucket Elevators
  - Grain Drying Systems
- Lubrication & other appropriate maintenance
  - Manufacturers' recommendations OR
  - Necessary by prior operating records

# Preventive Maintenance Program

- Correct dust collection systems
  - Malfunctioning
  - Operating below efficiency
- Correct or remove from service
  - over heated bearings
  - slipping or mis-aligned belts (bucket elevators)



# Preventing Dust Explosion

- Control Equipment/  
Hazard Monitoring
  - Zero speed (motion)
  - Bearing temperature
  - Belt alignment
  - Chain breaks
  - Plug sensors
- Add - inspect control equipment to PM program





# Grain Dryer Fire Prevention







# Grain Dryers

- Help preserve grain quality during storage
  - Protect market value
  - Reduce engulfment/entrapment hazards
- Maintain - manufacturer's recommendation
  - More frequently as needed
- OSHA 29CFR1910.272(p)
  - Continuous flow-bulk raw grain dryers

# Common Causes of Dryer Fires



Plugging of grain flow



Mechanical failure



Inadequate operator training

# Dryer Fire Prevention Tips

## Dryer Maintenance – Start-Up

- Annual inspection
- Fuel line pressure test
- Inspect all grain handling equipment
- Check operating controls for function
- Hazard-monitoring systems
- Emergency discharge gates
- Remember the tarp



# Dryer Fire Prevention Tips



Dryer Maintenance  
Proper cleaning  
**prevents** dryer fires

- Cleaning Schedule
- Cool down time
- Tarping

# Dryer Fire Prevention Tips

## Dryer Maintenance – For extended shut down

- Empty
- Inspect & clean
- Open drains
- Tarp
- Fire watch





# Interaction with Emergency Responders





# When you need an EAP

**OSHA requires a written EAP for workplaces with 10 or more employees.**

10 employees or less  
= Oral communication  
of the plan

Written plans have  
specific requirements  
from OSHA.

**A written plan is always BEST!**



# Emergency Action Plan

1910.272(d)*Emergency action plan.* The employer shall develop and implement an emergency action plan meeting the requirements contained in 29 CFR 1910.38 general industry Emergency action plans.

**BEST PRACTICES for all workplaces.**





# Emergency Responders



Our interactions with emergency responders should begin prior to an emergency.





# Fire Control Operations

During a fire emergency, the **facility manager & fire official** in charge **work together** to:

- Bring the fire under control
- Assure safety of employees, firefighters, media, spectators, etc.
  - Some state laws put fire official in charge of the scene for firefighting, rescue, & public safety.

**Establish roles** of fire officials & facility management in **preplanning** meetings.



# Fire Control Operations

- The fire command officer met upon his or her arrival.
- Employee head counts have been taken.
- Facility area and all entrances and exits have been secured.
- Contact has been initiated with relatives of missing employees.
- The status of power, water, and gas utility.
- Control of spectators.
- A company spokesperson is providing briefings to the media.
- Mutual aid arrangements and plans.

# Liaison with Outside Agencies

- OSHA (federal/state)
- News media
- Social service groups
- Local disaster or civil defense agency
- Coast Guard & port officials
- Law enforcement
- Insurance officials



# Wrap up



There is no substitute for an effective housekeeping plan



Create a dryer service/inspection plan based off your manufacturer's recommendations

Adjust inspection frequency by operational need



Exercise your facilities EAP

Become familiar with your first responders

Conduct joint training & facility familiarization

# Resources

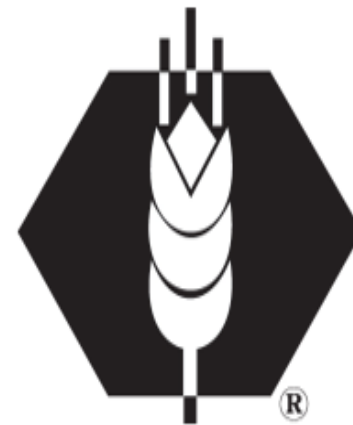
- [OSHA.gov](https://www.osha.gov)
- National Grain & Feed Assn. [ngfa.org](https://www.ngfa.org)
- Grain and Elevator Processing Society  
[geaps.com](https://www.geaps.com)



# Resources

National Grain and Feed Association's Safety Health and Environment Quality Committee has updated the 34-year-old document to encompass industry changes and new technology.

**NGFA Firefighting Manual  
... A Guide for Operators of Grain  
Handling Facilities and Fire  
Department Officials...**



# Thank You

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