Personal Protective Equipment and Respiratory Protection
OSHA 1910.132 – 1910.138

NGFA – AAI Safety Seminar
Johnston, IA
Presenter: Jim Maness,
JEM Consulting

June 13, 2013
Employers must protect employees from workplace hazards such as machines, hazardous substances, and dangerous work procedures that can cause injury.

Employers must:
- Use all feasible engineering and work practice controls to eliminate and reduce hazards.
- Then use appropriate PPE if these controls do not eliminate the hazards.

Remember, PPE is the last level of control!
Requires employers to supply PPE and have workers use the PPE once properly trained.
Engineering Controls

- If the machine or work environment can be physically changed to prevent employee exposure to the potential hazard,
- Then the hazard can be eliminated with an engineering control.
- Examples:
  - Initial design specifications
  - Substitute less harmful material
  - Change process
  - Enclose process
  - Isolate process
  - Ventilation
Work Practice Controls

- If employees can be removed from exposure to the potential hazard by changing the way they do their jobs,
- Then the hazard can be eliminated with a work practice control.
- Examples:
  - Personal hygiene
  - Housekeeping and maintenance
  - Job rotation of workers
Types of PPE

- Eye – safety glasses, goggles
- Face – face shields
- Head – hard hats
- Feet – safety shoes, rubber boots
- Hands and arms – gloves
- Bodies – vests
- Hearing – earplugs, earmuffs
- Respirators – Filtering face pieces (dust masks), full & half face mask respirators with filters or canisters, self-contained breathing apparatus, powered air respirators.
Fall Protection
Respiratory Protection
PPE Hazard Assessments

- **Grain elevator facilities**
  a. Head house & other grain handling areas
  b. Grain receiving and shipping
  c. Rail operations
  d. General grounds
  e. Barge loading/unloading
  f. Maintenance shops
  g. Grain storage
  h. Electrical control and MCC rooms.
# CERTIFICATION OF HAZARD ASSESSMENT

<table>
<thead>
<tr>
<th>Area Assessed:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person performing assessment:</td>
<td>Title:</td>
</tr>
</tbody>
</table>

## HAZARDS

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Yes</th>
<th>No</th>
<th>Continuous</th>
<th>Conditional</th>
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<tbody>
<tr>
<td>Motion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Temperature</td>
<td>Yes</td>
<td>No</td>
<td>Continuous</td>
<td>Conditional</td>
</tr>
<tr>
<td>Extreme Cold</td>
<td>Yes</td>
<td>No</td>
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<td>Conditional</td>
</tr>
<tr>
<td>Chemical Exposure</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Dust or Flying Particles</td>
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<td>Light Radiation</td>
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</tr>
<tr>
<td>Welding/Cutting</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-Intensity Lights</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Falling or Flying Objects</td>
<td>Yes</td>
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<td>Continuous</td>
<td>Conditional</td>
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<tr>
<td>Slippery Surfaces</td>
<td>Yes</td>
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<tr>
<td>Sharp Objects</td>
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<td>Rolling/Pinching Objects</td>
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<tr>
<td>Dropping Objects</td>
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<td>Fall from Heights Above 4'</td>
<td>Yes</td>
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<tr>
<td>Other</td>
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<td>No</td>
<td>Continuous</td>
<td>Conditional</td>
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</tbody>
</table>

## PERSONAL PROTECTIVE EQUIPMENT REQUIRED (CONTINUOUSLY)

- Hard Hat
- Footwear
- Safety Glasses
- Dust/Mist Respirator
- Other Respirator
- Face Protectors
- Arm Protectors
- Hearing Protectors
- Electrical Protective Equipment
- Gloves
- Other

## PERSONAL PROTECTIVE EQUIPMENT REQUIRED (CONDITIONALLY)

<table>
<thead>
<tr>
<th>Condition</th>
<th>PPE Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
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</tr>
<tr>
<td>b.</td>
<td></td>
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<tr>
<td>a.</td>
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<tr>
<td>a.</td>
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<tr>
<td>b.</td>
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## SIGNATURE OF PERSON PERFORMING ASSESSMENT: 

<table>
<thead>
<tr>
<th>Title:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
</tr>
<tr>
<td>b.</td>
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</table>
## Personal Protective Equipment Hazard Evaluation

### Plant

<table>
<thead>
<tr>
<th>Activity or Job:</th>
<th>Head Protection</th>
<th>Safety Glasses</th>
<th>Face Shield/Goggles</th>
<th>Safety Shoes</th>
<th>Hearing Protection (3)</th>
<th>Dust Mask</th>
<th>Apron</th>
<th>Safety Harness</th>
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<tbody>
<tr>
<td>Rail Unloading</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
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<td>X</td>
<td></td>
<td>X</td>
<td>(2)</td>
<td>(6)</td>
<td></td>
<td></td>
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<tr>
<td>Sack Unloading</td>
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<td>X</td>
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<td>Bulk Load-out</td>
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<td>X</td>
<td></td>
<td>X</td>
<td>(2)</td>
<td>(6)</td>
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</tr>
<tr>
<td>Sack Loading</td>
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<td>Micro Room</td>
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<td>Packing</td>
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<td></td>
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<tr>
<td>Palletizer</td>
<td>X</td>
<td>X</td>
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<td></td>
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<tr>
<td>Forklift</td>
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<td>X</td>
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<td>Maintenance</td>
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<td>X</td>
<td>(5)</td>
<td>X (5)</td>
<td>(2)</td>
<td></td>
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<td>(4)</td>
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<tr>
<td>Cutting/Welding</td>
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<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Boiler Chemicals</td>
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<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acid/CAustic Ingredient Handling</td>
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<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bin Digging</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blowdown Housekeeping</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yard Work</td>
<td>(1)</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

1) Cutting grass and power trimming require safety glasses.
2) Hearing Protection required when vibrators used, when beating on bins, and when using tools louder than 85 dBA.
3) Hearing Protection required in posted high noise areas.
4) Harness needed when working in areas where guard rails are not present.
5) Electrical PPE (including electrical rated safety shoes) required for Qualified Electricians.
6) Filtering Face Piece (Dust Mask) may be needed while receiving or loading certain ingredients.

### Note:
This document is designed to be used as a template. Each facility should carefully review and edit the evaluation to fit specific plant requirements.

### Annual Review Documentation:
I have reviewed this Hazard Evaluation and the written PPE program. Changes are noted on the documents. Initials and review dates are below.

_________________________  ______________________  ______________________  ______________________  ______________________
                        11/30/2023                                   12/28/2023                                   01/23/2024                                   02/24/2024

_________________________  ______________________  ______________________  ______________________  ______________________
                        4/10/2023                                   05/01/2023                                   05/23/2023                                   06/12/2023
Training Requirements

**Training shall address:**
- When PPE is necessary;
- What type is necessary;
- How to wear it properly;
- Limitations of selected PPE;
- Proper care & maintenance;
- Useful life and disposal

**When to do training:**
- Initially;
- If PPE Changes;
- If changes in workplace;
- If workers shows they did not retain training;
- All training is to be certified (written record)
<table>
<thead>
<tr>
<th><strong>PERSONAL PROTECTIVE EQUIPMENT TRAINING CERTIFICATION</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility Name:</td>
</tr>
<tr>
<td>Facility Location:</td>
</tr>
<tr>
<td>Employee Name:</td>
</tr>
<tr>
<td>Date:</td>
</tr>
</tbody>
</table>

**INSTRUCTION PROVIDED IN:**

- WHEN PPE IS NECESSARY
- WHAT PPE IS NECESSARY
- USE, CARE, MAINTENANCE, USEFUL LIFE, LIMITATIONS AND DISPOSAL PROCEDURES FOR THE FOLLOWING:
  - HEARING PROTECTORS
  - EYE PROTECTION
  - FACE PROTECTORS
  - FOOTWEAR
  - HARD HATS
  - FALL PROTECTION
  - GLOVES
  - ARM PROTECTORS
  - ELECTRICAL PROTECTIVE EQUIPMENT
  - OTHER

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**THE ABOVE NAMED EMPLOYEE HAS DEMONSTRATED THE FOLLOWING**

- A PROFICIENCY IN THE USE, CARE, MAINTENANCE AND DISPOSAL PROCEDURES OF THE ABOVE LISTED PERSONAL PROTECTIVE EQUIPMENT

- A KNOWLEDGE IN THE USEFUL LIFE, LIMITATIONS AND WHEN TO WEAR THE ABOVE LISTED PERSONAL PROTECTIVE EQUIPMENT.

- RESPIRATORY PROTECTION

<table>
<thead>
<tr>
<th>Facility Manager or Designate:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee Signature:</td>
<td></td>
</tr>
</tbody>
</table>
Inspection and Maintenance

- PPE needs to be properly maintained and in safe condition.
- Respirators must be inspected monthly.
- Workers must be trained in its use. New emphasis by OSHA on PPE training.
- Facilities are required to do an assessment of plant areas to document what needs to be worn and under what conditions.
Respiratory Protection Standard
29 CFR 1910.134
Respiratory Protection Standard

a ) Permissible Practice
b ) Definitions
c ) Respiratory Protection Program
d ) Selection of Respirators
e ) Medical Evaluation
f ) Fit Testing
g ) Use of Respirators
h ) Maintenance & Care of Respirators
i ) Breathing Air Quality & Use
j ) ID of Filters, Cartridges & Canisters
Respiratory Protection Standard

k) Training & Information
l) Program Evaluation
m) Recordkeeping
n) Dates of Compliance

Appendices:
A  Fit testing Procedures
B1 User Seal Check Procedures
B2 Respirator Cleaning Procedures
C  Medical Evaluation Questionnaire
D  Employees using Respirators Voluntarily
Permissible Practice
1910.134(a)(1)

In the control of those occupational diseases caused by breathing air contaminated with harmful substances...
The primary objective shall be to prevent atmospheric contamination.

First priority is to eliminate hazard if possible using:
Engineering Control Measures
Where engineering control measures are not feasible, or are being instituted, appropriate respirators must be used.

Respirators shall be provided by the employer when such equipment is necessary to protect the health of the employee.
## Potential Respiratory Hazards

What respiratory hazards are you concerned with?

<table>
<thead>
<tr>
<th>SUBSTANCE</th>
<th>OSHA PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Dust - Barley, Oats Wheat</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>Grain Dust - Corn, Soybean</td>
<td>15 mg/m³</td>
</tr>
<tr>
<td>Phosphine</td>
<td>0.3 ppm</td>
</tr>
<tr>
<td>Ammonia</td>
<td>50 ppm</td>
</tr>
<tr>
<td>Chlorine</td>
<td>1 ppm</td>
</tr>
</tbody>
</table>
Selection of Respirators

How do you make a “Reasonable Estimates” of employee exposure?

The employer shall identify and evaluate the respiratory hazard(s) in the workplace...shall include a “reasonable estimate” of employee exposure...

1) Monitoring
2) Data Composite
3) Mathematical Approaches
Are respirators:
- necessary to protect the health of the employee; or
- required by the employer?

**YES**
Must establish and implement a written respirator program with worksite-specific procedures.

**NO**

Does the employer permit voluntary use of respirators?

**YES**

Does the only use of respirators involve the voluntary use of filtering facepieces (dust mask)?

**YES**
- Respirator itself does not create a hazard,
- Provide copy of Appendix D,
- No Respirator Program required.

**NO**
- OSHA does not allow voluntary use of any type of respirator other than filtering facepieces. Implement full respirator program.

STOP
Program Requirement Clarification

- Required Use = Full Program
- Voluntary Use = Appendix D (Exception: When non-dust masks are used, a full program is required that includes “Medical Evaluations” and “Fit Tests”.)
At grain handling facilities, there are certain jobs that have the potential to exceed the PEL for grain dusts.

- Cleaning or working in grain bins.
- Blowing down.
- Performing housekeeping duties.
- Loading out trucks at inside load-outs.

If you require the use of a filtering face pieces (dust masks) you must have a full program.
Program Administrator and Written Program

The employer shall designate a program administrator who is qualified by training or experience to oversee the program.

- Appointing a program administrator is not only required, it may be a pivotal factor on whether the program is successfully implemented.

Develop and implement worksite-specific procedures and elements for required respirator use.

- Identify where respirators are required.
Selection of Respirators
1910.134(d)(3)

Select respirators that are adequate to protect employee health and that ensure compliance with other OSHA standards.

Based on “Routine” needs. and on Foreseeable emergency needs.
Selection of Respirators

- The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.

- Immediately Dangerous to Life and Health (IDLH) ...is an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual’s ability to escape from a dangerous atmosphere.
  - No APR’s allowed.
  - SCBA or supplied air ONLY.
Use of Respirators 1910.134(g)

The standard requires the employer to establish and implement procedures for the proper use of respirators.

For face piece seal protection, the following are Prohibited Conditions:
• Removing the respirator in a hazardous environment.
• Facial hair...between face and facepiece.
• Glasses or goggles.
• Any condition that interferes with the face-to-facepiece seal or valve function.
Use of Respirators
Appendix B–1

User Seal Check

Employees must perform a user seal check each time they put on a tight fitting respirator.
The employer shall provide a medical evaluation to determine the employee’s ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace.
Medical Evaluation
Scope and Administration

- Use the Medical Evaluation Questionnaire found in Appendix C.
- Identify a physician or other licensed health care professional (PLHCP) to perform.
- If questionnaire type evaluation is administered:
  - Must provide confidentiality.
  - During employee’s normal working hours.
  - In manner that ensures understanding.
  - Including opportunity for employee to discuss questionnaire and examination results.
Fit Testing
1910.134(f)

- All employees required to use tight fitting negative or positive pressure respirators must be fit tested.
Tight-Fitting Respirators

Half Mask

Filtering Facepiece
Tight-Fitting Respirators

Half Mask

Full Facepiece
Loose Fitting Respirators

Hood

Helmet

Facepiece
Qualitative Fit Testing (QLFT)

- Four OSHA accepted protocols:
  - **Bitrex** (denatonium benzoate)
  - Saccharin
  - Isoamyl acetate (banana oil)
  - Irritant smoke (stannic chloride)
Quantitative Fit Testing

- Quantitative fit testing methods rely on objective data to determine a proper fit. As a result, the test produces quantifiable results.
## Acceptable Fit Testing Methods

<table>
<thead>
<tr>
<th>Type of Respirator</th>
<th>QLFT</th>
<th>QNFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half-face, Negative Pressure APR (Up to 10X PEL)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Full-face, Negative Pressure APR (Up to 10X PEL)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Full-face, Negative Pressure APR (Over 10X PEL)</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
What type of fit test must be done when using this type of respirator?

QLFT or QNFT?
Fit Testing Frequency

- Prior to initial use.
- Annually thereafter.
- Whenever a different style or model of facepiece is to be used.
- Whenever changes affecting respirator fit are observed.
- Whenever employee determines fit is unacceptable.
Maintenance & Care of Respirators

- Cleaning / Disinfecting
  - Respirators must be clean and maintained in a sanitary condition.
  - According to OSHA’s *Appendix B–2*.
- Properly store all (non-disposable) respirators.
  - Protect from damage.
  - Follow manufacturers recommendations.
- Inspections for respirators used routinely:
  - Before each Use and during cleaning
- Inspections for Emergency use respirators:
  - Before and after each use.
  - At least monthly
  - According to manufacturer instructions.
Training and Information General Requirements

- Training must be provided to all employees who are required to wear a respirator.
- Must be comprehensive and understandable.
- Employees must be able to explain:
  - Why a respirator is necessary.
  - What are the limitations and capabilities of the respirator.
  - How to use the respirator effectively in emergency situations, including malfunction.
  - How to inspect, don/doff, use and check the seals of the respirator.
  - The procedures for respirator maintenance and storage.
  - How to recognize medical signs & symptoms that may limit the effective use of the respirator.
Training and Information Frequency

- Prior to initial respirator use.
- Annually thereafter.
- Changes in the workplace or respirator type.
- Inadequacies in the employee’s knowledge.
- Any other situations in which retraining appears necessary to ensure safe respirator use.
- The employer is to provide basic information on respirators to employees wearing respirators (filtering face pieces) on a voluntary basis.
Program Evaluation
1910.134 (I)

- Ensure that the program is properly implemented and continues to be effective.

- A program evaluation must be performed:

- Any problems identified must be addressed and corrected.
Recordkeeping Requirements
1910.134 (m)

The employer must establish and retain the following written information:

- The Written Respiratory Program
- Medical Evaluations / Recommendation
- Initial and Annual Fit Testing
- Training