Commission on Oil and Natural Gas Industry Safety

Oct. 27, 2015

Lawrence J. Malone
Chairman

and

Director of Policy
Office of Governor Earl Ray Tomblin
Commission Members

Cabinet Members
Public Service Commission/Pipeline Division
Representatives:
  ▫ Industry - production, pipeline, processing
  ▫ Trucking
  ▫ Labor
Legislators (ex-officio)
Objectives

1. Ensure the safety of hardworking West Virginians at drilling sites, production facilities and pipelines across the state; and

2. Determine how to best to protect workers at natural gas operations while ensuring our workers have the proper training and skills to do their jobs in the safest, most effective way possible.
Objectives Cont.

3. Review current federal and state oil and natural gas workplace safety regulations;
4. Assess data on worksite incidents and accidents;
5. Examine training and industry best practices; and
6. Provide recommendations for improving workplace safety in the oil and natural gas industry in West Virginia.
Scope of Worksite Safety Study

- Engineering/Site Preparation
- Exploration/Drilling/Production
- Hydraulic Fracturing
- Completion
- Gathering Systems
- Transmission Lines/Systems
- Distribution Lines and Facilities
- Natural Gas/Shale Processing Plants
Oil and Gas Extraction Activities: Overview of Safety Hazards and Health Risks

Sources:
https://www.osha.gov/SLTC/oilgaswelldrilling/healthhazards.html
https://www.osha.gov/SLTC/oilgaswelldrilling/safetyhazards.html
Safety Hazards

- Vehicle Collisions
- Struck-By / Caught-In / Caught-Between
- Explosions and Fires
- Falls
- Confined Spaces
- Ergonomic Hazards
- High Pressure Lines and Equipment
- Machine Hazards
Vehicle Collisions

- Well sites are often in remote locations, requiring workers to travel long distances.

- According to the Occupational Safety & Health Administration (OSHA), highway vehicle collisions are the leading cause of oil and gas extraction worker fatalities.

- Approximately 40% of fatalities in the industry are caused by vehicle collisions.
Struck-By/ Caught-In/ Caught-Between

- Workers are at risk of being struck-by, caught-in, or caught-between moving vehicles or equipment, falling equipment, and high pressure lines.

- OSHA estimates that 60% of all on-site fatalities are caused by workers being struck or caught.
Explosions and Fires

- Workers face the risk of fire and explosion due to ignition of flammable vapors and gases.
- Flammable gases, such as well gases, vapors, and hydrogen sulfide, can be released from wells, trucks, production equipment, and surface equipment such as tanks and shale shakers.
- Ignition sources include static, electrical energy, open flames, lightning, cigarettes, cutting and welding tools, hot surfaces, and frictional heat.
Falls

• Workers may be required to access platforms and equipment located off-ground.

• OSHA requires fall protection to prevent falls from the mast, drilling platform, and other elevated equipment.

• Due to the remote locations of may oil and gas well pads, a worker may be stranded without help after a fall.
Confined Spaces

• Workers are required to enter tanks, pits, excavated areas, containers, and other confined spaces.
• Hazards include ignition of flammable vapors, asphyxiation, and chemical exposure.

Ergonomic Hazards

• Risks include lifting heavy items, bending, reaching overhead, pushing and pulling heavy loads, working in awkward body postures, and performing the same or similar tasks repetitively.
High Pressure Lines and Equipment

• Workers are exposed to hazards from compressed gasses and high pressure lines.
• Internal erosion of lines may cause line leaks or bursts and connection failures may cause lines to fall.

Electrical and Other Hazardous Energy

• Workers may be exposed to uncontrolled electrical, mechanical, hydraulic, or other hazardous energy.
• Equipment that is not designed, installed, and maintained properly poses additional dangers.
Machine Hazards

- Workers may be exposed to a wide variety of rotating wellhead equipment, including top drives and Kelly drives, drawworks, pumps, compressors, catheads, hoist blocks, belt wheels, and conveyors.

- There is also the potential to be struck or caught between unguarded machines.
Health Hazards

- Hydrogen Sulfide
- Silica
- Diesel Particulate Matter
- Hazardous Chemicals
- Naturally Occurring Radioactive Material (NORM)
- Noise
- Fatigue
- Temperature Extremes
Incidents and Accidents in West Virginia

Source:
- WVDEP, Office of Oil & Gas
Permit Completions For New Wells

* - awaiting final 2014 numbers
<table>
<thead>
<tr>
<th>Occurrences</th>
<th>Incident/Accident Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>Flash of gas / explosion / fire.</td>
</tr>
<tr>
<td>10</td>
<td>Worker struck by falling / dislodged equipment.</td>
</tr>
<tr>
<td>7</td>
<td>Moving machinery rolled over / crushed worker.</td>
</tr>
<tr>
<td>3</td>
<td>Employee trip / fall.</td>
</tr>
<tr>
<td>1</td>
<td>Well fluid hit worker.</td>
</tr>
<tr>
<td>1</td>
<td>Employee knocked second employee into mast.</td>
</tr>
<tr>
<td>1</td>
<td>Vapor exposure.</td>
</tr>
<tr>
<td>1</td>
<td>Suffocation.</td>
</tr>
<tr>
<td>1</td>
<td>Tongs backspin.</td>
</tr>
<tr>
<td>1</td>
<td>Tree fell and struck worker.</td>
</tr>
<tr>
<td>1</td>
<td>Heart attack.</td>
</tr>
<tr>
<td>1</td>
<td>Not specified.</td>
</tr>
<tr>
<td><strong>63</strong></td>
<td><strong>TOTAL Incidents/ Accidents 2000-2015</strong></td>
</tr>
</tbody>
</table>
Subcommittees

- Regulations
- Safety, Training and Best Practices
- Emergency Response & Notification
- Transportation
Initial Findings

• No general increase in accidents, incidents even with recent upturn in activity, construction
• OSHA: violations are decreasing
• State’s Horizontal Well Act driving safety planning, communications
  ▫ Many companies have safety programs in place
    • Using safety best practices
  ▫ Local responders benefiting from direct communications, safety training
• WVDOH oil and gas policy working well
Final Report

- Due November 15, 2015