Implementing an In-Vehicle Monitoring Program: A Guide for the Oil and Gas Extraction Industry

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Presented for the OSHA Oil and Gas Safety Conference, 2012
Who is NIOSH?

• The National Institute for Occupational Safety and Health (NIOSH) is the US federal agency responsible for conducting research and making recommendations for the prevention of work-related injury and illness

• NIOSH is part of the Centers for Disease Control and Prevention (CDC) in the Department of Health and Human Services

Oil & Gas Extraction Program
Provide effective interventions to reduce rate of illness and injury:
• High quality research
• Practical solutions
• Partnerships
• Research to Practice – r2p
Background

- Oil and gas extraction industry employed 499,437 workers in 2011, US\(^1\)
- Oil well operators, drilling contractors, service companies
- Fatality rate is 7 times that of all US industries; varies by company type and establishment size
- Leading cause of fatality is motor vehicle crashes

\(^1\)Data Source: Bureau of Labor Statistics, QCEW
### Most Frequent Fatal Events 2003-2009
**Oil and Gas Extraction Workers, US**

<table>
<thead>
<tr>
<th>Injury Event</th>
<th>Fatalities</th>
<th>% Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highway crash</td>
<td>202</td>
<td>28.5</td>
</tr>
<tr>
<td>Struck by object</td>
<td>144</td>
<td>20.3</td>
</tr>
<tr>
<td>Explosion</td>
<td>57</td>
<td>8.0</td>
</tr>
<tr>
<td>Caught/compressed in machinery or tools</td>
<td>50</td>
<td>7.1</td>
</tr>
<tr>
<td>Fall to lower level</td>
<td>46</td>
<td>6.5</td>
</tr>
<tr>
<td>Fire</td>
<td>40</td>
<td>5.6</td>
</tr>
<tr>
<td>Electric current</td>
<td>36</td>
<td>5.0</td>
</tr>
<tr>
<td>Aircraft crash</td>
<td>25</td>
<td>3.5</td>
</tr>
<tr>
<td>Other</td>
<td>108</td>
<td>15.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>708</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: CDC-NIOSH APO; with restricted access to BLS, Census of Fatal Occupational Injury data.
Motor Vehicle Fatality Rate 2003-2009
Oil & Gas Extraction vs. Other Industries, US

Sources: CDC-NIOSH with restricted access to BLS CFOI and Quarterly Census of Employment and Wages. *NOTE: Excludes 6 fatalities of private wage and salary workers 2003-2009 who were not classified by industry.
MV Fatalities by Vehicle Type 2003-2009
Oil & Gas Extraction Type, US

- Pickup truck: 51.5%
- Semitrailer, tractor trailer, trailer truck: 26.7%
- Unknown or other types of truck: 12.4%
- Automobile: 5.9%
- Other types of vehicles: 3.5%

Source: CDC-NIOSH with restricted access to BLS CFOI data (N=202)
Some key findings:

• Seatbelts
• Speed
• Small companies, contractors
  Lack of resources and experience
  Sense of urgency; 24/7 business
  ‘Get ‘er done’
• Short service employees ‘Green hats’
  High turnover
  Limited labor pool
Research to Practice (r2p) Process

• Analysis of motor vehicle fatalities
• Literature review of ‘best practice’
• Interviews of industry experts on road safety
• Formation of a NIOSH Oil & Gas Motor Vehicle Workgroup
Opportunities for improved safety

• Training & Education
  Driver competence
  On-board orientation
  Journey management

• IVMS
  In-Vehicle Monitoring System
  • On-board coach
  • Provides alerts
  • Calculates a driver score
IVMS

• Records data such as date, time, speed, acceleration, deceleration, safety belt use of a driver/vehicle

• Measures driver performance against a predetermined set of parameters

• Has shown to be effective in realizing immediate and positive effect on driver behavior
Reported Benefits of IVMS in Literature

Oil & Gas literature – SPE papers:
• Reduces motor vehicle crash rates (50%-93%) ¹
• Reduces speeding (60%) ²
• Reduces miles driven (8%-20%) ³

Other literature:
• Federal Motor Carriers Safety Admin. (FMCSA) study found significant reduction in “safety-related” events in 2 commercial motor vehicle operations in a 17-week evaluation⁴
• A study of 250 emergency vehicle drivers found that it encourages safety belt use (13,500 to 4 violations) ⁵

Reported benefits of IVMS in interviews:

- Targets high risk driver behavior
- Contributes to social responsibility
- Reduces maintenance costs
- Can be used as tool for verifiable Hours of Service
- Reduces insurance premiums, claims, citations
IVMS Challenges

• Lack of awareness of actual needs
• Lack of knowledge of capabilities / limitations
• Lack of experience in implementation
• Lack of knowledge in deriving greatest value from the data
The Results

A guide which is intended to provide companies with a structured approach and help them to:

• Decide whether to install monitors
• Select a system that meets needs
• Successfully implement an IVMS
• Employ the data provided by monitors to improve motor vehicle safety
• Effectively track its effects on crash rates
Sections of the Guide

• An overview of motor vehicle fatality data for the industry
• Reported benefits of using IVMS
• 4 steps to implementing IVMS
• Appendices with additional tools (common IVMS features, driver coaching form, etc.)
A structured approach in 4 Steps:

- Select
- Plan
- Deploy
- Review
Key considerations

- Make sure hardware matches operating environment (e.g. communications)
- Consider amount of maintenance required
- Conduct a pilot test of monitors
- Carefully set thresholds for tracking indicators (not too lax or too sensitive)
Key considerations

• Educate leadership about the system. Their engagement and visible support is essential.

• Solicit staff support and establish critical roles, responsibilities and accountabilities

• Tracking all vehicles and drivers is ideal. Otherwise: vehicles with high numbers of miles, passengers, hazardous materials, etc.

• Develop communications campaign and training to fully inform drivers of expectations
Key considerations

• Handle any resistance to IVMS through clear expectations, training and positive reinforcement

• Implement a policy for recognition and accountability

• Conduct installation and training with the least amount of hassle to drivers

• Drivers with low scores should be coached. The coach should be able to determine whether operational pressures contribute to poor driving.
Key considerations

• Fleet manager should monitor data daily for at-risk behaviour
• Track for trends and earlier warnings
• Overall unit or company data should be posted publicly at least monthly
• Track the performance of the IVMS program implementation (e.g. % of vehicles with working monitors)
• Track crash rates and correlate to IVMS data; use the data for improvement
• Monitor the data to measure ROI
Considerations for Success

- Leadership and commitment
- Policy, for clarity and consistency
- Communication
- Training
- Accountability
- Attention to detail
- Support
- Follow through
Dissemination and Evaluation Plan

- SPE / APPEA International Conference on Health, Safety and Environment, 2012
- OSHA Oil and Gas Safety Conference, Dallas, 2012
- SPE Americas E&P HSSE Conference, 2013
- Feedback from industry polling and work group
- O&G insurance companies, other industry organizations and opportunities

http://www.cdc.gov/niosh/programs/oilgas/products.html
Conclusion

• Motor vehicle fatality rate in the O&G industry is high
• IVMS, in conjunction with a motor vehicle safety program, is a promising tool
• IVMS is not a silver bullet, nor is it for everyone. Carefully consider the variety of devices and features available to select the product that best meets your needs.
• Goal of the guide is to be a reference for everyone
Acknowledgements

Eric Bourquin - *Texas Mutual Insurance*
Rob Bult - *Illini State Trucking*
Elaine Cullen - *Prima Consulting*
Charles Gardiner - *Baker Hughes*
Daniel Garstang - *Hess*
Nathan Gatewood, David Kinsey - *Halliburton*
Dave Meade - *Schlumberger*
John Myers, Stephanie Pratt - *NIOSH*
Ron Palmer - *Brads Electrical*
Jim Thuma - *Berry Brothers General Contractors*
Mark Trostel, Chris Nielsen, Jim Thatcher - *Encana Natural Gas*
Simon Williams - *Independent Road Safety Consultant*
Thank You

Questions?