Near Term Solutions to a Long Term Problem

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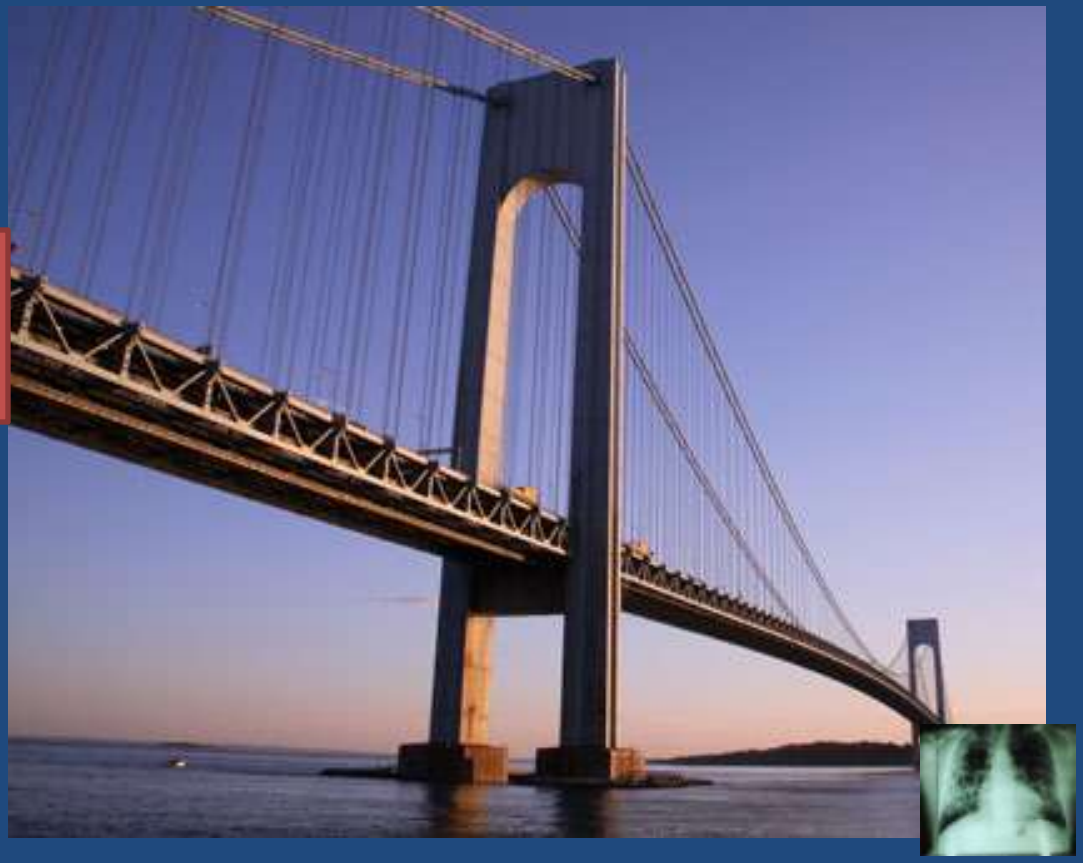
Fact 1

- Silica is a long term problem
  - Historical
  - Common
  - Chronic

YOU ARE HERE

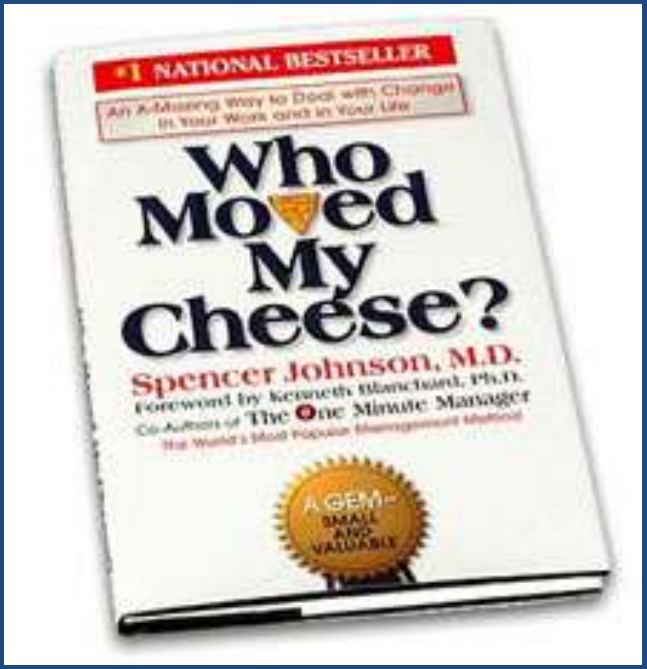


Fact 2

- A body at rest tends to stay at rest

Fact 1 + Fact 2 = Complacency

- Long term problem + short term inaction = failure



Achieving momentum

- Perfection not required

Industry *Movement*

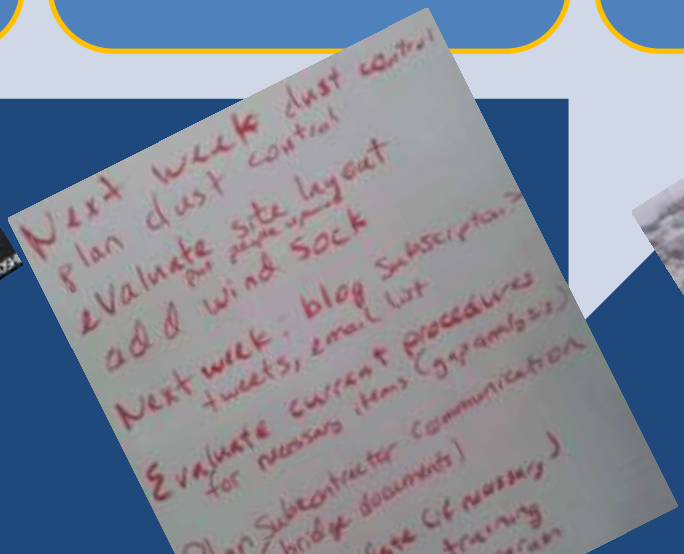
- What can we do right NOW
- No cost
- Nothing new

What did we do?

NIOSH Awareness

Develop Short Term Fix List

Implement



“Short Term Fix” list organization

1. Management Commitment
2. Training & Education
3. Follow EXISTING programs
4. Best Management Practices (BMP) from other industries
5. NIOSH BMPs

The list is flexible

Silica Focus Group "Quick Fix Suggestions"

Mitigating Respirable Silica Exposure in Hydraulic Fracturing

Location: _____

Action	Date	Responsible Party
1. Develop a written plan to describe company actions to reduce or prevent respirable silica exposure. Include at a minimum: o Exposure reduction work practices and procedures (e.g., capping unused fill ports, minimizing sand fall distances during transfer operations, using enclosed cabs/booths, etc.) o Respiratory protection requirements o Decontamination/hygiene requirements		
2. Schedule representative baseline industrial hygiene monitoring and determine actual silica exposures relative to various equipment and proppants		
3. Inform management about silica hazards, include at a minimum: • Sources of silica, anticipated exposures, and silicosis • Respiratory protection programs and management roles • Worker protection levels and projected exposure levels • Company actions to reduce or remove silica exposure		

4. Conduct & document worker silica awareness training through safety classes, job / hazard safety analysis (JSA/HSA) and/or pre job safety meetings to inform workers about silica hazards and what methods will be used at the site to reduce exposure; • Include on-site subcontractors in the communication and training • Include Respiratory Protection requirements		
5. Identify through signage and/or training the seven points of generation identified by NIOSH and equipment-specific potential exposure zones at the work site		
6. Identify the proppant being used during the pre-job safety meeting and review the MSDS/SDS prior to beginning each job		
7. Post signage: e.g., "Respiratory Protection Required" and/or "Potential Silica Exposure" in appropriate languages on or near exposure zones		
8. Limit non-essential workers in potential exposure zones		
9. Ensure that all workers required to wear respirators are provided the correct NIOSH-certified respirator (based on exposure) and are medically cleared, trained, and fit tested.		
10. Provide accommodations and require workers to wash hands		

and face prior to eating drinking, smoking and leaving location		
11. Instruct employees to clean silica from clothing or change into clean clothes at the end of the worker's shift; include instructions for workers on handling silica contaminated clothing		
12. Clean enclosed worker congregation areas such as trailers or dog houses if the areas become contaminated with silica dust using HEPA vacuum or water based cleaning methods		

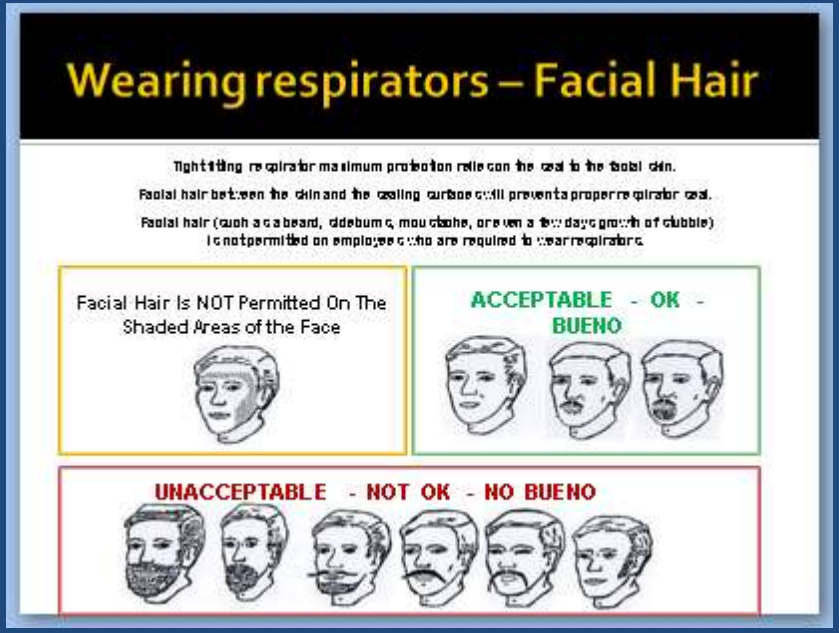
Mitigating Silica Exposure in Hydraulic Fracturing – References

There are many tools available to support your efforts to improve worker safety. In addition to the links below, your workers compensation insurance carrier may be an excellent resource.

1. OSHA/NIOSH Hazard Alert: https://www.osha.gov/dts/hazardalerts/hydraulic_frac_hazard_alert.html
2. OSHA Chemical Sampling Webpage: http://www.osha.gov/dts/chemicalsampling/data/CH_266740.html
3. OSHA Guide to Respiratory Protection: http://www.osha.gov/Publications/3384small-entity-for-respiratory-protection-standard-rev.pdf
4. NIOSH Silica Webpage: http://www.cdc.gov/niosh/topics/silica/
5. OSHA Silica Webpage: http://www.osha.gov/dsg/topics/silicacrystalline/index.html
6. OSHA Hazard Communication Webpage: http://www.osha.gov/dsg/hazcom/index.html
7. OSHA Access to Medical and Exposure Records: http://www.osha.gov/Publications/osha3110.pdf

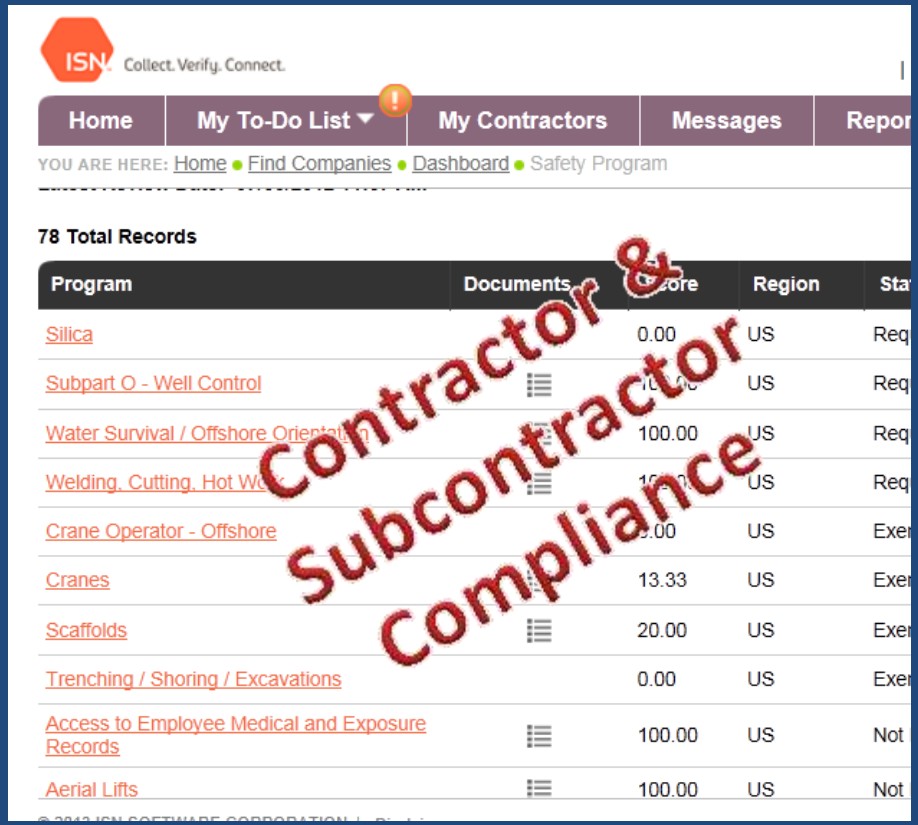
What I've seen in the field

- Lower level management over-reaction
- Workers not following existing programs
- Missing (M)SDS
- Confusion about which respirator to wear
- NIOSH Hazard Alert not posted



What's next?

1. Management Commitment
2. Follow EXISTING programs
3. Best Management Practices (BMP) from other industries
4. NIOSH BMPs
5. **Training & Education**



Now:

- Training & Education
- Challenges
  - Public opinion
  - Language barriers
  - Acceptable risk communication
- Seeing is believing

Public Opinion

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Awareness vs. training & education

Awareness: look! It’s a plane!

Training: this is a plane.

Education: a plane flies due to aerodynamics

Training & Education – employer's role

Awareness – anyone’s role

Increasing awareness

- Who is the audience?
- What do they need to be able to do with the info?
- When can we start the awareness process?