ENERGY SAFETY CANADA

CONTROLLING INVERT EXPOSURE

Toolbox Talk

AGENDA

- What is Invert
- Health Effects
- Exposure Routes
- Where Could I be Exposed
- Invert Controls
- Other Considerations

Photo Courtesy of NIOSH

WHAT IS INVERT

» Invert is an oil-based drilling fluid that is a complex mixture of hydrocarbons (base oil), water and additives

» Invert is used because it reduces the time to drill a well and the risk of wellbore problems

» Invert can present a variety of health and safety risks, such as:
- Flash fire
- Worker exposure to hydrocarbons

HEALTH EFFECTS

» Invert exposure can lead to a variety of acute health effects such as:
  - Irritation of eyes
  - Skin rashes and dermatitis
  - Headaches
  - Nausea

» Prolonged exposure can increase the risk of:
  - Pneumonia
  - Lung cancer
  - Liver damage
  - Blood disorders
  - Bone cancer

EXPOSURE ROUTES

» Exposure is by way of three routes:

- Inhalation
  - Typically exposure to oil mist; however, exposure to hydrocarbon vapour may be a concern
- Skin Contact
  - Invert on the skin can lead to rashes and it can also be absorbed into your body and affect organs elsewhere
  - Invert on your fire retardant coveralls also decreases the chance of surviving a flash fire
- Ingestion
  - Are designated eating areas and wash facilities available?

WHERE COULD I BE EXPOSED?

» Work locations:
  - Shakers, mud tanks, centrifuges and drilling floor

» Work activities:
  - Catching cuttings samples, wash gun use, mud tank cleaning, and tripping pipe

» Work events:
  - Invert spills and well kicks

INVERT CONTROLS

» Substitution:
  - Use water-based and synthetic drilling fluids whenever feasible
  - Do not use diesel or base oil in wash guns

» Engineering controls:
  - A mud can
  - Drill pipe strippers
  - Pipe racking drip trays
  - Local exhaust ventilation on the shakers

Photo Courtesy of M-I SWACO

INVERT CONTROLS (CON'T)

» Administrative controls
- Flash point analysis to verify that:
  - Flash point is at least 10ºC higher than either the anticipated flow line and ambient temperature
  - Flash point is equal to or above 61ºC
- Written programs to manage worker exposure
- Written work procedures detailing:
  - Sample collection
  - Wash gun use and prohibition of the use of diesel in wash guns
- Signage at mud tank and shaker work locations indicating that respiratory protection is required

INVERT CONTROLS (CON'T)

- Personal protective Equipment (PPE) Controls
  - Gloves:
    - Neoprene gloves are recommended
  - Coveralls:
    - Change coveralls if they become saturated with invert
    - Use fire retardant protective clothing (rain suits), preferably neoprene, when conducting tasks like tripping pipe and mud tank cleaning

INVERT CONTROLS (CON'T)

» Respiratory Protection:
  - Use at minimum a half mask with combination P100 and organic vapour (OV) cartridges when:
    - Catching samples
    - On the mud tanks during mud pumping
    - Using a wash gun to clean shaker screens
    - When in the vicinity of someone using a wash gun
  - Additional hazards may necessitate higher levels of protection

Photo Courtesy of Honeywell

OTHER CONSIDERATIONS

» Lock-out of hazardous energy
  - Mud tank cleaning
  - Centrifuge and shale dryer clean-outs

» Confined space entry
  - Mud tank cleaning
  - Shale dryer clean-outs

Photo Courtesy of Eelgin Industries

HOW MIGHT THIS IMPACT US

- Have we set up the workers for success in managing this hazard?
- How confident are we that these exposure risks are being managed?
- Do we have a plan to transition away from PPE controls?

ADDITIONAL INFORMATION

- DACC Industry Recommended Practice (IRP) 14: Non-Water Based Drilling Fluids
- Energy Safety Canada, Controlling Chemical Hazards Guideline

For additional information please contact
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