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
INVERT CONTROLS (CON’T)

» Administrative controls
  • Flash point analysis to verify that:
    – Flash point is at least 10°C higher than either the anticipated flow line and ambient temperature
    – Flash point is equal to or above 61°C
  • 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
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 Safety@EnergySafetyCanada.com