Fracking Health & Safety Hazards & How to Control Them

“Fracking,” or hydraulic fracturing, is a process used to extract oil and natural gas locked within deep rock formations that were once thought unreachable. It typically involves pumping large volumes of water and sand thousands of feet into a well at high pressure to break up shale and other tight rock formations, allowing oil and gas to flow into the well. The process unfolds over six phases, each of which poses different hazards and Occupational Health and Safety (OHS) compliance challenges.

Phase 1: Rig Up

Fracking requires use of equipment not typically found at conventional wells. The process of transporting and assembling the equipment and materials is called rig up. **Potential Hazards:**

☐ Exposure to crystalline silica dust, diesel fumes, and hazardous noise levels.

☐ Falls from heights.

☐ Slips, trips, and falls.

☐ Moving vehicles and equipment struck-by incidents.

☐ Pinch points of machinery and equipment.

☐ Fire and explosion.

☐ Sprains, strains, and other musculoskeletal injuries (MSIs).

Phase 2: Well & Equipment Testing

Before fracking begins, well servicers conduct a pressure test on the system by pumping fresh water, brine, or drilling mud into the well. The hydraulic pressure is increased gradually during the test so that the final test pressure is above the maximum fracturing pressure, but below the lowest component failure pressure. **Potential Hazards:**

☐ High pressure lines struck-by incidents.

☐ Unexpected release of pressure.

☐ Rotating equipment.

☐ Exposure to diesel fumes.

☐ High noise levels.

Phase 3: Perforation of the Well Casing

The fracking job begins by perforating the well casing to create holes allowing oil or gas to flow into a casing or liner and rise up to the surface. To perform perforation, a specialized crew lowers special explosive equipment into the well by a wireline unit or conveyed by tubing. Then, a specialized gun shoots small holes into the casing of the producing zone. **Potential Hazards:** the risk that the explosives will go off prematurely before they're lowered into the well.

Phase 4: Fracking Fluid Blending & Pumping

After the well casing is perforated, workers blend a base fluid called the "proppant" (typically water, methanol, liquid carbon dioxide, or liquefied petroleum gas) with chemical

additives to create a fracturing fluid to hold the perforations open so the oil and gas can flow up. Separate trucks are used to blend and pump the fracking fluid down into the well. **Potential Hazards:**

□ Exposure to crystalline silica dust, diesel fumes, concentrated chemical additives, and hazardous noise.

□ Vertical and horizontal falls.

□ Moving and rotating equipment.

□ Struck-by high pressure lines.

□ Unexpected release of pressure.

□ Fire, explosion, and uncontrolled chemical reactions.

□ MSIs.

Phase 5: Isolation

Once a stage is fully fractured, workers isolate it from the rest of the well by inserting a plug into the well. This requires what are called wireline operations. **Potential Hazards** during wireline operations include being struck by the wireline due to line failure.

Phase 6: Flowback

After the entire well has been fractured, workers reduce the pressure at the wellhead and drill out the isolation plugs. A mixture of fracturing fluid and gas or oil flows back out of the well through flow lines into pits or tanks. **Potential Hazards:**

□ Struck-by high pressure lines.

□ Fire and explosion.

□ Exposure to hazardous gas or vapours.

□ Exposure to high noise levels.