



Cryogenic Freeze Quick, Cost-Effective Barrier



Freeze services have been used for many years to place a temporary ice plug barrier in tubulars (tubing, drill pipe, casing) when it is the only viable option to maintain pressure control while allowing remedial repairs to be made to surface equipment or tubulars. The cryogenic freeze service delivers an expedient, low-cost alternative to conventional well kill operations.

Proven Temporary Barrier

In recent years, Wild Well has worked with Texas A&M University to explore cryogenic freezing. Using liquid N_2 , or CO_2 , in combination with integral temperature monitors, an effective freeze can be safely and efficiently completed. The freeze process is monitored and temperature precisely maintained to ensure it is kept within recommended guidelines. Through the use of N_2 , or CO_2 , the freeze can be put into effect and held indefinitely to isolate inoperable tree components. Once the freeze is established, a positive and/or negative pressure test can be completed to confirm the temporary barrier is in place, allowing repair operations.

Within certain parameters, cryogenic freezes can be set across multiple strings of casing resulting in an effective temporary barrier in the innermost tubular.

Effective when hydrocarbons are present

In order to establish a freeze barrier, there must be a freezable medium (brine, water, mud, etc.) in the ID of the component. If there is flow, any void, or gas or hydrocarbon-based fluid present in the freeze area, a freezable medium must be injected

into the ID of the component. This can be through a hot tap to a tubular or possibly through the tree assembly.

When liquid hydrocarbons are present, Wild Well's newly developed FreezeLITE, a special water-based fluid, can be injected into the freeze zone. FreezeLITE will displace hydrocarbon-based fluids and stay suspended in the freeze zone above the hydrocarbon-based fluid. This allows a freeze to be put into effect without having to remove the hydrocarbon-based fluids in the well – *saving thousands of dollars in terms of product and time.*

FreezeLITE is non-hazardous and safe for onshore and offshore applications.

Cryogenic Freezing is proven to be a quick, cost-effective, and safe solution when a temporary barrier in the wellbore/component is needed for completing remedial work at the surface.

Features and Benefits

- Cost effective remedial solution, reducing downtime
- Eliminates expensive kill fluids
- When hydrocarbons are present
- Applicable for tubulars up to 36-inch diameter, including multi-string casing
- Systems easily transportable