



**U.S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region**

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Mud Logging Unit Explosion and Fire

Recently, an explosion and fire occurred in a mud logging unit during the final phase of rigging it up. Gas analyzers had been calibrated and the flame ionization detection (FID) and total hydrocarbon analyzer (THA) modules were left in operation so that they could stabilize. The mud logging personnel were hooking up the outside sample points and drains when the explosion and fire occurred.

The mud logging unit used FID instrumentation that required hydrogen gas to be piped into the unit to serve as the fuel for the flame within the instrumentation. It must be noted that the piping and hose connections used to pipe the hydrogen gas to the unit were neither pressure tested nor checked for leaks; the unit had no gas detection equipment installed to detect either hydrogen or test/sample gas, nor did the hydrogen bottle have any shutdown equipment installed to prevent flow should a leak occur. In addition, the inside connection was piped to the detection modules with polyurethane hose, which was either blown loose or burned off the connector in the initial explosion and fire. This development allowed the hydrogen to continue to flow and feed the fire in the mud logging unit.

Therefore, from this information, we recommend the following:

1. Lessees, operators, and contractors shall consider equipping compressed hydrogen and other flammable gas bottles or generators that supply gas to mud logging units with automatic shut-off systems.
2. Lessees, operators, and contractors shall consider equipping mud logging units that use FID instruments with a gas detection system that provides an audible alarm and shuts in the gas supply when the ambient air reaches the lower explosive limit.
3. Lessees, operators, and contractors shall consider equipping FID instrument systems with automatic shut-off systems to shut down both the gas supply and the instrument itself should a flame failure occur.
4. Lessees, operators, and contractors shall consider equipping mud logging units with a positive purge system that sounds an audible alarm and shuts down the unit when the purge pressure falls below a minimum level.
5. Lessees, operators, and contractors shall review the piping supplying combustible gases to mud logging units to ensure that the piping is constructed of appropriate material.
6. Lessees, operators, and contractors shall check the piping supplying combustible gases to mud logging units to ensure that there are no leaks after installation of the piping.

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