



# Safety Alert

From the International Association of Drilling Contractors

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**ALERT 98-13**

## Mud Logger Explosion & Fire

### WHAT HAPPENED:

A Mud Logging Unit was in the final phase of rig up when an explosion and fire occurred. The gas analyzers had been calibrated and the Flame Ionization Detection (FID) and Total Hydrocarbon Analyzer (THA) modules were left operating to stabilize while the outside sample points and drains were hooked up. This Mud Logging Unit used FID instrumentation that required hydrogen gas to be piped into the unit. The hydrogen gas was used as the fuel for the flame within the instrumentation. An explosion completely destroyed the unit.

### WHAT CAUSED IT:

1. Hydrogen gas built up and saturated the end wall panel and electric panels, causing an explosive mixture to occur.
2. The gas piping and hose connections were neither pressure tested nor checked for leaks.
3. No gas detection equipment was installed in the unit to detect hydrogen or test/sample gas releases.
4. No automated shut-off was installed on the hydrogen bottle to prevent flow should a leak occur.

The inside connection was piped to the detection modules with polyurethane hose which either burned or was blown loose from the connector. This situation allowed the hydrogen gas to continue to flow, feeding the fire within the unit.

### CORRECTIVE ACTION:

1. Complete a review of potential hazards prior to modifying any equipment.
2. Ensure that an automatic shut-off system is installed on compressed hydrogen and other flammable gas bottles or generators that supply gases to a mud-logging unit.
3. Install a gas detector in any unit or building using FID instruments, which will give an audible alarm and shut off the gas or supply generators feeding a unit or building should the ambient air condition reach the lower explosive limit (LEL).
4. Ensure that the FID instrument system will shut off the hydrogen gas supply and the instrument itself should a flame failure occur.
5. Ensure that there are written procedures and they are used to check any gas sources or lines for leakage to the atmosphere.
6. Ensure that units have a positive purge system that gives an audible alarm and shuts down the unit or building when the purge pressure falls below minimum levels.
7. Utilize appropriate materials for the construction of lines when combustible gases are used.

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**The Corrective Actions stated in this alert are one company's attempts to address the incident, and do not necessarily reflect the position of IADC or the IADC HSE Committee.**

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