



# Safety Alert

From the International Association of Drilling Contractors

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ALERT 09 – 04

## EXPLOSION / FLASH FIRE ON RIG FLOOR FOLLOWING GAS RELEASE

### WHAT HAPPENED:

Following a logging run on drill pipe the drill string was pulled out of the hole (POOH). During the trip out, the well did not take the correct amount of fluid while pulling through the horizontal section. Instead of returning to bottom, the decision was made to continue POOH. After laying down all the logging tools, the drill string was run into the hole to TD in order to clean out the well. The driller then pulled back to 4303 m to circulate, during which time he observed a flow increase, so he shut in the well. The decision was made to circulate out any influx using the Driller's Method. During this circulation returns were lost and the BOP was opened to observe the well. Mud and gas came through the table so the BOP was closed again. Gas alarms sounded. Pumping was resumed. After a time of pumping, pressure gauges read "0." The BOP was opened again to observe the well. Again, mud and gas came through the table and gas alarms sounded. **An explosive flash fire then occurred.** Eight persons were injured. All were evacuated to hospital.

### WHAT CAUSED IT:

- **Mud weight was insufficient to control the well.** Mud weight was approximately 0.5 ppg underbalanced.
- **Standard Operating Procedures were not followed during trip.** The trip tank and trip sheet were not used during the trip out of the hole to indicate mud volume discrepancies prior to start of circulation. Although it was recognized that the well was not taking the correct fluid volume, corrective action was not taken.
- **Incorrect assessment of critical well control situation in spite of known underbalance.** It was assumed the influx was "trip gas."
- **Well-kill procedures not followed.** A kill sheet was not completed and pump strokes were not being counted.
- **BOP was opened twice without knowing the status of the well.**
- **Gas alarms did not produce the appropriate response.** Alarms were deactivated and then reset. Additional personnel came to the rig floor rather than reducing the number of personnel.
- **Wind direction.** Allowed the escaped gas to accumulate on and under rig floor and driller's cabin.

### WHAT WENT RIGHT

- Off-duty personnel mustered when gas alarms sounded.
- Well was quickly and completely shut in after the fire.
- SCR system to floor was shut down after the fire.
- Fires on the floor were quickly extinguished after the explosion.
- Medical treatment on rig and evacuation was well done and timely.

### CORRECTIVE ACTIONS: To address this incident, this company did the following:

- **Instructed rig supervisors to always flow check through the choke first before opening the BOP.** If total strokes to kill the well have not been circulated, **never open the BOP to check the well.** Check for flow by opening choke with BOP closed. If losses have occurred, treat losses until circulation is restored and continue killing the well.
- More effective well-control training to recognize a critical well-control situation; how to perform calculations; procedures and methods for handling lost-returns while shut in and circulating.

**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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- More effective training to recognize and respond to alarms and non-standard situations.
- Mandatory use of trip tank (with trip sheet to determine losses or gains).
- Instructed rig management and maintenance personnel to ensure **all** possible ignition sources on or around the rig floor are isolated and meet hazardous-area requirements and standards.
- Improve ventilation on and under drill floor and Driller's cabin to prevent gas accumulation.
- Safety Management System audits are to include audits of operational procedures. These audits are to be conducted utilizing cross-functional personnel from operations, maintenance, engineering, etc.

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