



Safety Alert

From the International Association of Drilling Contractors

ALERT 12 – 01

RUPTURED PISTON ON MUD PUMP LEADS TO PUMP HOUSE FIRE

WHAT HAPPENED:

The rig was drilling at approximately 2,030m (6,660 feet) with invert (oil and water mixture) drilling fluid in the tanks, pumping with approximately 21,500 kPa (3,118 psi) pump pressure. The rig crew noticed smoke coming out of pump house #1. The rig crew gathered all the fire extinguishers on site (five – 30lb (13kg) extinguishers and two – 150lbs (68kg) extinguishers, from the tank farm) and attempted to extinguish the fire. The crew was unsuccessful; therefore, the Driller and Rig Manager shut-in the well. The fire spread to pump house #2, then over to the mixing area of the mud tanks causing fire damage to the mud tank platform behind the buildings and to the contents on the platform.

WHAT CAUSED IT:

- The piston/pump rod covers on the on the F-1000 mud pump were left in the open position and made from expanded metal screen material which allowed the drilling fluid to spray out from the mud pump piston rod cavity and back to the engine area.
- Fire originated in pump house #1 when the drilling fluid contacted the turbo charger of the engine located in the pump house building and ignited.
- The probable cause of the fire was a ruptured piston in the mud pump that allowed invert drilling fluid to spray throughout the pump house.
- Because of the pressure in the mud pump system, aided by the turbulence in the pump house from the cooling fan on the opposite side of the engine, the oil in the invert was atomized (reduced to a fine spray) which then ignited when it came into direct contact with the nearer of the two turbochargers on the engine.
- Electrical and other mechanical causes for this fire were considered and eliminated.

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

- Instructed rig personnel to install hinged plated covers or covers with Lexan® Glass inserts on all mud pumps to ensure any drilling fluid from ruptured pistons will be contained within the piston rod cavity of the mud pump. Some plate covers may require a slot to accommodate the piston lubricator hose.
- Instructed rig personnel that all pump rod covers are to be kept closed during pumping operations.
- Issued a directive that all engines located in the mud pump house will have exhaust blankets or wraps to protect the turbochargers and exhausts on the engines from being sprayed with drilling fluid.

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.

This material is presented for information purposes only. Managers & Supervisors should evaluate this information to determine if it can be applied to their own situations and practices

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