Safety Alert

From the International Association of Drilling Contractors

ALERT 03 – 51

TRAPPED PRESSURE IN ANNULAR RESULTS IN A NEAR MISS

WHAT HAPPENED:

While undertaking maintenance on a 13 5/8" 10K Annular Blowout Preventer, one of four pull down bolts had been removed and removal of the second was underway when the annular cap was suddenly ejected from the annular body a distance of 4 to 5 ft up from the assembly. The cap landed slightly off centre back on top of the annular. The three remaining pull down bolts were sheared when the cap was ejected. There were no injuries to personnel.

WHAT CAUSED IT:

Subsequent examination of the stripping accumulator bottle bladder showed that it had ruptured and as a consequence, the nitrogen pre-charge was not confined to the accumulator system, instead, pressure was introduced under the annular operating piston and "locked in" due to the design of the control system pipe-work which incorporated quick disconnect couplings. These quick disconnect couplings only allow fluid to flow when the male and female elements are made up. If disconnected as in this case, they act as block valves preventing fluid return from the top of the operating piston. When the cap locking jaws were released, the force on the piston was transferred to the four pull down bolts via the annular cap. The bolts are not designed as load bearing devices and after the first one was removed, the force on the piston was sufficient to shear the remaining bolts and eject the cap.

CORRECTIVE ACTIONS: To address this incident, this company issued the following instructions to rig and maintenance personnel:

1. Review Safety Alert.
2. Raise awareness of isolation policy within Permit to Work System.
3. All systems to be isolated from all actual and potential energy sources and bled off prior to maintenance and controlled through the permit to work system.
4. Specific risk assessment for removing annular cap to involve pressure hazards and to be reviewed by a mechanic, a hydraulics engineer, or a person who has a through understanding of the system.
5. Bleed manifold with gauge equipment to be considered for visually checking pressure/bleeding pressure and checking integrity of the bladder.
6. Consider undoing locating pull down bolts first, then undoing locating jaws to reduce likelihood of personnel standing over annular cap.

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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