Safety Alert

From the International Association of Drilling Contractors

ALERT 02 – 06

MUD PUMP PULSATION DAMPENER EXPLOSION

WHAT HAPPENED:

An explosion occurred in the Mud Pump Room of a Jackup Rig operating off the coast of West Africa. At the time of the explosion the rig was filling the drill string with drilling fluid (oil based mud). The explosion originated in one of the rig's mud pump pulsation dampeners. Although no one was injured damage consisted of foreign matter penetrating the deck and flooring of the galley.

WHAT CAUSED IT:

A pre-charge was carried out on the pulsation dampener on mud pump number one, ten days prior to the explosion. The bottle used was marked Nitrogen and the valve fitting in the top of the bottle was the correct type for the nitrogen charging assembly. Upon investigation, it was determined that the bottle contained oxygen instead of nitrogen and the pulsation dampener had in fact been charged with Oxygen instead of Nitrogen. During operation of the mud pump to fill the drill string, the bladder inside the pulsation dampener ruptured allowing the gas used to pre-charge the bladder to mix with the Oil Base Mud. The gas then ignited under pressure resulting in the separation of the pulsation dampener cap from the body of the pulsation dampener.

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

- Developed a system to inspect nitrogen bottles on all rigs to ensure no other gases are present.
- Developed a procedure to check all nitrogen cylinders upon being received at the work site and before placing in use.
- Standardized a color code system for all gas cylinders used.
- Developed a program to require testing and documentation of all nitrogen cylinders contents at the shore base prior to transport offshore.
- Standardized valves used for nitrogen to be different from other valves used in other gas cylinders.

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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