



Safety Alert

From the International Association of Drilling Contractors

ALERT 14 - 01

INTERNAL EXPLOSION RUPTURES CROWN MOUNTED COMPENSATOR PIPING

WHAT HAPPENED:

Two employees were in the derrick equalizing the internal pressure between Composite Air Pressure Vessels (CAPV) on the Crown Mounted Compensator (CMC) when an ignition occurred inside the system. Either heat generated by adiabatic compression or static generated by the air transfer led to ignition inside the CAPV. Thereafter, the associated raise in pressure and temperature resulted in the interconnecting piping rupturing. Two employees received non-life threatening injuries and were subsequently transported to a shore-based medical facility for further treatment.



Failed CAPV and Interconnected Pipe



CAPV Outlet Flange



Ruptured Interconnected Pipe



Ruptured Interconnected Pipe

WHAT CAUSED IT:

- Combustion occurs because of a combination of three elements: heat, fuel, oxidizing agent (e.g. oxygen).
- High temperature is a result of rapid pressure increase in a pressurized air system. The CAPV Bottle that was being brought on-line was at a much lower pressure than the operating system pressure.
- A fuel source in the CAPV Bottle ignited due to the high temperature generated by the air transfer or static that was caused by the rapid air transfer.
- The temperature rise generated by the air transfer exceeded the melting temperature of the CAPV liner.

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

- The company notified the manufacturer of the event to assist in the investigation.
- The company held safety stand-downs to review the incident and discuss the lessons learned.
- The company developed specific work instructions to bring CAPV online in accordance with manufacturer's recommendations which included following a cool down cycle while filling CAPV bottles with air.

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.