



## CASE STUDY

OISD/CS/2025-26/E&P/06

24.06.2025

### **INTRODUCTION:**

**Title:** Major Fire at Drilling Rig

**Location:** Onshore- Drilling Rig

**Loss / Outcome:** Loss of Equipment

### **BRIEF OF INCIDENT:**

On 07 March 2025 at 00:40 hrs., a major fire broke out at in a Drilling Rig, deployed for a workover operation. The fire occurred during the installation of the riser onto the Blowout Preventer (BOP). Rig personnel made immediate efforts to extinguish the fire; however, the blaze intensified and spread to the rig floor and rear wheels of the carrier. Firefighting started immediately and brought under control. The incident caused extensive damage to critical components, including the draw works, rear trailer tyres, brake drum shoes, drilling console, rotary hoses, sub-structure, and associated cabling. Fortunately, no injuries were reported.

### **OBSERVATION / LAPSES:**

- a) NO CCTV were installed at site.
- b) In the Pre-Workover Conference (PWOC) document, under Rig Safety requirements, no safety items—including the HC gas detector—were marked as working or not, with only exception of the Crown-O-Matic and Floor-O-Matic.
- c) The gas detector installed at the Bell Nipple area did not trigger any alarms, indicating no gas presence, or it may have been faulty. The gas detectors were calibrated as per schedule.
- d) 12 no's of rear tyres of rig carrier found totally burnt, but front side tyres appeared to be intact.
- e) Black smoke marks were observed approximately up to seven meters from cellar pit on the Rig carrier side.
- f) The cellar pit showed no black smoke marks or signs of fire, and no fire impact

was observed on either the Wellhead or the installed production BOP.

- g) The welder was assigned overtime during the night shift to assist the drilling team, even though assisting drilling team was outside his designated welding/cutting role.
- h) According to the training matrix, all personnel on shift at the time of the incident had completed firefighting training; however, the crew was unable to respond effectively during the actual fire.
- i) Although mock drills were conducted in accordance with the ERP, the practical response to the actual fire was poor.
- j) The fire monitor's water throw was insufficient and failed to reach the location of the fire. This was primarily due to leakages observed in the 100 mm delivery hoses that supply water from the fire water pump to the fire monitor. Additionally, there appears to be a potential choking issue within the fire monitor itself, further impacting its performance.

### **PROBABLE REASONS OF FAILURE / ROOT CAUSE:**

Based on the investigation, the most probable cause of the fire appears to be ignition from nearby hot work, such as welding or cutting, carried out in an area with combustible materials like oily rags and lubricants. Although a gas spike was recorded by the detector at the Bell Nipple, no fire damage was found near the wellhead or cellar pit, suggesting that the fire likely may not have originated from a gas leak. The presence of burnt rear tyres, black smoke marks on the rig carrier side, and the unusual assignment of a welder to assist the drilling team during night shift support the possibility of an external ignition source.

### **RECOMMENDATIONS:**

- 1) The gas detector annunciator panel should be regularly inspected at least at the time of installation on new wellsite to ensure the proper functioning of all parameters, including alarms and audio-visual indicators, under real-time conditions. This ensures reliable performance and prompt response in case of any hazardous gas presence.
- 2) Even though smoking or mobile phones were ruled out, stricter non-smoking policies should be enforced, in the drill site and operational areas. All personnel should be reminded that smoking or using mobile phones within operational area is strictly prohibited.
- 3) Ensure all electrical systems, including wiring and equipment, are regularly checked for potential faults or short circuits that could lead to sparks or ignition, particularly in hazardous environments. (Refer OISD-STD-137).
- 4) Flammable materials, such as oily cotton rags, crude oil, lubricating oils, and other combustible substances, should be stored in designated, well-ventilated areas away from any potential sources of ignition, including electrical equipment, hot work zones.

- 5) Any spillage of flammable materials should be cleaned up immediately to avoid the accumulation of hazardous substances that could potentially ignite due to friction or spark.
- 6) All non-routine activities, such as hot work, should strictly be carried out under a work permit system.
- 7) Only personnel with appropriate training and qualifications should be assigned to specific roles; for example, welders should not be engaged in drilling crew tasks, and vice versa.
- 8) Fire Fighting Equipment should be inspected & maintained as per requirements of OISD-STD-142.
- 9) Regular fire drills covering various fire scenarios, as outlined in the Emergency Response Plan, should be conducted. These drills must also be held during odd hours to test readiness at all times. Fire tenders should be involved periodically to improve their experience and response time. Any shortcomings observed during the drills should be recorded and discussed. In addition, step-by-step guidelines for handling different types of fires should be developed, and all personnel should be trained accordingly through regular drills.
- 10) All personnel should actively participate in drills and be adequately competent enough to respond to actual emergency scenarios.

**SITE PICTURES:**



12 rear tyres (Including both side) completely burnt



Draw works condition after fire