

Oil Industry Safety Directorate Safety Alert

E&P (Onland)

No. 13/05

Title: Incident of fire and fatality at a drilling rig during subduing operation
Location: Drilling Rig
Activity Type
(Result/outcome): Fire & fatality

What happened:

The well (where the accident occurred) was under production testing.

Subsequent to perforation and activation attempts, pumping of water through annulus was started to subdue the well by reverse wash, and the return through tubing (gas and oil) was being taken in crude oil tanks placed near waste pit. The return line was not connected through mobile testing separator unit.

During the reverse circulation, fire broke out near the oil tanks and one person with completely burning coverall was seen. Two persons rushed to his rescue and received minor burn injury in this process. All the three persons were immediately shifted to hospital. The person, having 70 - 80% burns passed away.

Observations on the incident:

- i. The mobile production separator was not used to separate and discharge the gas at a safe distance from the rig. Though production separator was available at the site at the time of this incident, the gas /oil were taken in the open roof crude oil tank.
- ii. SOP (Safe Operating Procedures) for 'Killing or subduing of well' was available but it did not mention steps for separation and discharge of associated gas at safe distance from the rig.
- iii. The deceased production engineer was not having portable gas detector with him during the operation.

What caused it:

1. Source of Hydrocarbons (Explosive flammable atmosphere):

The root cause of the incident was deficient operating procedure (Non usage of oil / gas separator unit). Gas cloud may have formed near the tanks in the absence of wind, as feeble gas was flowing from the well to the crude oil tanks through return line during the well under observations' period.

During reverse wash of the well, gas volume of upper portion of the well was displaced and released at the top of the crude oil tank.

2. Source of ignition:

It is quite likely that normal cast iron hammer was used during tightening of any leaking hammer union joint of T-manifold resulting in spark which ignited the explosive/combustible atmosphere already existing in the area.

Role of inadvertent use of mobile phone acting as source of ignition cannot be ruled out.

Corrective actions:

- The SOP for 'Killing or subduing of well' should include the steps to be followed to ensure separation of associated gas from oil and its discharge at a safe distance from the rig. SOP should be followed diligently. (Had the adequate SOP been there and was being followed, oil / gas separator would have been lined up to receive well return).
- Carrying of Mobile phones inside the operational area shall be prohibited.
- Only non-sparking tools should be used where there is any chance of presence of hydrocarbon.
- Work permit system should be enforced strictly. Gas % should be checked before carrying out any job in hydrocarbon bearing area.

It is provided for information purpose. This information should be evaluated to determine if it is applicable in your operations, to avoid reoccurrence of such incidents.