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PIPER ALPHA disaster

Two decades after an explosion and fire ripped through the Piper Alpha oil production platform in the North Sea off the coast of Scotland, killing 167 of its 226 crew members, the horror of the disaster remains fresh in the mind

On the 20th anniversary of the Piper Alpha disaster, memorial services and newspaper headlines recalled the horror of the devastating explosion and fire that shocked the world. Judith Hackitt, chair of the UK Health & Safety Executive, spoke of the lost lives and of those who were injured, recalling that it was as a result of the inquiry into the incident that the HSE's Offshore Division was established.

The accident

Few of those on the platform would have known details of the maintenance work that was underway as the day shift was about to handover to the night shift. Among the tasks the day shift crew had been working on was the maintenance of a condensate pump which compressed gas for transport to the coast.

The pump was removed for routine maintenance. The condensate pipe was opened and temporarily sealed with a flat metal disk. Because the work could not be completed before the shift changeover, the metal disc was left in place.

As shifts were changing at 6pm, the day shift supervisor wrote handover notes and gave them to the contractor. The next shift came on duty but was unaware that there was no pressure release valve in the pump that was being overhauled and that the valve had been replaced by the metal disc.

Later in the evening, at 9.45pm, a second condensate pump stopped suddenly and could not be restarted. The power supply for offshore construction work was dependent on this pump working, which meant that there were only a few minutes to bring it back online.

Could the pump which had been shut down for maintenance be turned on? A permit-to-work document relating to the overhaul was found, but there was no second permit-to-work document which would have stated that the pump must not be started under any circumstances due to the missing valve. Nobody present was aware that the valve had been removed and replaced by a metal disc. From the only document to hand, it seemed that it would be safe to start the pump and so it was switched on.

Gas flowed to the pump and because the safety valve was missing, it produced an overpressure, the loosely fitted metal disc couldn't withstand. Gas leaked out at high pressure. Alarms were triggered but before any action could be taken, the gas ignited and exploded.

Of the 226 members of the platform crew, 167 died.

Causes

An enquiry was set up to establish the cause of the disaster. It concluded that the initial condensate leak was the result of maintenance work being carried out simultaneously on a pump and related safety valve. The Piper Alpha's operator, Occidental, was found guilty of having inadequate maintenance and safety procedures. A number of factors contributed to the severity of the incident:

- There was a lack of communication between maintenance staff and the platform's crew and between shift changes. The system of communication on Piper Alpha had become too relaxed: employees relied on informal communications.
- Permit-to-Work System was not followed

- There were shortcomings in the safety management system - managers had minimal qualifications, which led to poor practices and ineffective audits.
- The disaster would not have occurred if the pump where work was being done had been positively isolated.

Lessons

Many lessons were drawn from the Piper Alpha disaster. At a policy level, the British Government established the Health and Safety Executive's Offshore Division. But at the operating level, there are lessons for even the smallest workplace:

- Quality of safety management is critical
- Auditing is vital
- Safe systems of work, including permit-to-work system, need to be adhered to
- Need for training for maintenance workers and supervisors
- Adequate communication between all parties involved or affected by the maintenance operation
- Proper isolation of plant for maintenance

SUMMARY

The horror of the Piper Alpha disaster, in which 167 workers died on a North Sea oil platform off the coast of Scotland, is still fresh in the memory more than 20 years after the terrible events of June 1988.

On the day the disaster occurred, the day shift maintenance crew was working on the condensate pumps which compressed gas. One of the pumps was removed for routine maintenance and the condensate pipe was temporarily sealed with a flat metal disk. Because the work could not be completed before the next shift change-over, the metal disc was left in place as the day shift went off duty. The shift coming on duty was unaware of this. Later in

the evening, when the other condensate pump stopped working, the pump under maintenance was started up. Gas leaked out at high pressure, ignited and exploded.

The lessons to be learned from the Piper Alpha tragedy are that the quality of safety management is critical and safe systems of work, including permit-to-work system, have to be followed. Effective communication between all parties affected by any maintenance procedure is crucial. The plant where maintenance work is being done has to be properly isolated and there is a need for safety training for workers and managers.