**Piper Alpha - Chain of events**

**7.00pm –**Diesel and electric saltwater pumps that fed the platforms on-board fire-fighting system from the ocean were switched from automatic to manual control.

This protocol was carried out because management on the rig had identified that these pumps may prove hazardous to the platform’s divers if activated when they were in the water.

**9.45pm –**The primary condensate pump tripped out and the nightshift staff were unable to restart the pump. Without the pump the platform would need to cease operations at great a great cost to production and finance. At this stage the nightshift staff considered whether to re-commission the spare condensate pump that was under maintenance in order to restart operations

On the day of the incident, the nightshift staff were aware that the spare condensate pump had been removed for a large overhaul. They believed very little work had been done to the spare pump and that re-commissioning the pump should be relatively a simple process of restoring the flow of electricity and opening up suction and delivery valves.

However, the nightshift team were unaware that a second piece of maintenance on the pump’s relief valve had been undertaken on the same day

The reason for this misunderstanding is largely down to failures in the Permit-to-work system. Due to the platforms policy on overtime, the two-man team of contractors working on the relief valve overhaul had chosen to pause the job at 6pm and to complete the job in the morning. Work on the pump was incomplete.

When the contractor attempted to return a permit explaining the current state of the pump the operations manager had a heavy workload. Instead of returning and discussing the permit directly with the operations manager, the supervisor left the permit on the operations manager’s desk. Subsequently, when the nightshift started the operations manager had no knowledge that the works had not been completed. Additionally the permits for the two jobs on the pump were not linked meaning that when the nightshift reviewed the permits later they were unaware of the work on the valve.

**9.45pm – 9.59pm –**Night shift staff were unaware of a second piece of maintenance work that had been undertaken on the spare pump and continued to recommission the pump prior to the completion of scheduled works.

At this stage condensate began to leak at the point where the relief valve had been removed.

**9.59pm –**A series of gas alarms started sounding in the control room to warn about leaked gas.

During the subsequent enquiry, the control room operator reported that all of the gas alarms that sounded were in low lying areas indicating that the gas that was leaking was likely to be heavier than air, most likely Propane.

**10.00pm –**Leaking condensate ignited causing an explosion in the Gas compression module.

This initial explosion was large enough to disable the communication equipment. Preventing Piper Alpha from communicating with On-Shore emergency services and the other two connected oil platforms.

This explosion was large enough to blow-down/damage several firewalls including the firewall between the gas compression module and the oil-processing module. Although in the design of the platform the designers/construction team had installed firewalls between the modules no explosion/blast proofing walls had been introduced.

The impact of the blast immediately ruptured oil pipework in the adjacent oil-processing module.

**10.00pm –**Almost immediately following the gas explosion a very large oil fire ignited causing large plumes of toxic black smoke to engulf large portions of the platform.

The large plumes of smoke produced by the oil fire were blown north by the wind engulfing the lifeboats and preventing escape via lifeboat.

This was a prolonged oil fire that lasted longer than the supplies of oil on the platform would normally have allowed. The main reason for this is that the initial explosion had knocked out communication between the platforms. Although the other two platforms were reported to be aware of the fire on Piper Alpha from nearby ship radio communications, they continued to pump oil to the platform under the assumption that Piper Alpha would be able to control the fire.

The subsequent enquiry indicated that no simulation or training had been undertaken to prepare any of the rigs for how to proceed in a scenario in which a major accident would occur on one of the connected rigs.

**10.25pm** – After sustained weakening from the oil fire, a gas pipe carrying compressed gas at approximately 2000 Psi from the other two platforms burst. A large explosion and gas fire ensued.

Tharos a fire fighting ship attempts to extent a walkway to the platform however a design oversight on the ship meant that the ladder was unable to fully extend it’s walway to the platform before 10.50pm

**10.50pm** – A second gas riser burst further fuelling the enormous gas fire.

The Tharos rescue fireship is driven off due to extreme heat.

**11.20pm –**The pipeline that connects Piper Alpha and the claymore platform bursts**.**

**11:50 p.m.** The generation and utilities Module (D), which includes the fireproofed accommodation block, slips into the sea.