

Compressor Failure and Subsequent Fire on Facility

What happened?

A high pressure gas compressor experienced a catastrophic failure during start up on an FPSO (Floating Production Storage and Offload) vessel. This failure caused a hydrocarbon gas release that auto ignited, resulting in a local jet fire at the compressor and a second fire within the gas turbine enclosure. Fortunately no personnel were injured during the incident.



Centrifugal gas compressors are widely utilised on production facilities within Australian waters. They are typically used to compress gas required for export or well re-injection. A typical gas compressor configuration consists of 1st LP (low pressure) stage, 2nd IP (intermediate pressure) stage and 3rd HP (high pressure) stage.

What could go wrong?

- High reliance on a single piece of safety critical equipment - for example, an instrument
- Inadequate commissioning of the compressor's control systems
- Inadequate protection systems in place to protect compressors from operating outside design limitations
- Personnel overwhelmed by 'Nuisance' Alarms' can overlook significant alarms

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- Personnel not trained for site specific equipment operation
- Inadequate management of safety device 'inhibits'
- Inadequate commissioning of fire protections systems

Key Lessons:

- Ensure commissioning activities are correctly undertaken and verified by competent persons.
- Ensure control room operations personnel have the required competence and training for their specific control system and type of compressor on location.
- Ensure control room operators are not overloaded by 'nuisance' alarms by ensuring effective alarm management through alarm rationalisation.
- Any overrides on safety controls should be controlled and be properly risk assessed.
- Repetitive alarms need to be properly investigated and resolved.
- Ensure effective management of procedural controls by compliance monitoring.
- Wherever possible minimise dependence on operators in safeguarding the compressor.
- Develop the compressor's safe guard system to ensure a fail safe design.
- Consider the impact of an instrument failure in machine control or protection systems, particularly if fail-to-danger is undetected.
- Ensure integrity of fire protection systems

Who is responsible?

Under provisions of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*, operators of facilities have a duty of care to ensure that plant and equipment at the facility are safe and without risk to health. Suppliers of plant have a duty to ensure that plant, when properly used, is safe and without risk to health.

Contact

For further information email alerts@nopsa.gov.au and quote Alert [39].