

Flare and blowdown assurance study



Study and evaluation of the flare and blowdown systems for BP UK offshore assets.

BP is a global oil and gas operator. ABB were asked to develop flare system hydraulic models and conduct ice and hydrate assessments for their North Sea production platforms.

The aim of the studies was to:

- Provide a full validated Aspen Flare System Analyser model for each system
- Identify gaps between the current flare system design of the asset and company standards
- Address actions raised from recent asset HAZOP studies
- Address concerns regarding ice and hydrate formation

The development of the flare system models and preliminary ice / hydrate screening was completed within 10 months. With the understanding of the criticality of the work, its extensive scope and the relatively short schedule, ABB proposed a specific strategy in order to align the project framework with the client's goals.

Solution

ABB utilised their 5-phase methodology to ratify some existing models and develop new Aspen Flare System Analyser models for all flare systems. A simplified flow diagram for the 5-phase methodology is given below.

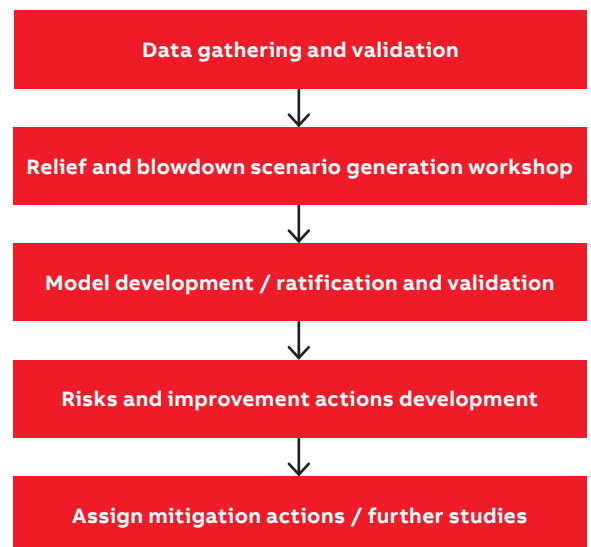


ABB worked closely with the BP team to gather information for the study. For each system, a collaborative workshop was setup at the BP office to review the original relief scenario defined from the flare and blowdown philosophy and identify any new scenarios which could involve multiple relief streams in the header and disposal system.

Where necessary ABB performed pressure relief calculations to determine the non-governing case relief capacity (i.e. fire relief capacity on a gas blowby relief valve in a pool fire event); control valve maximum capacity calculations to determine the worst case flowrate; flow across orifice calculations to determine the maximum flow and minimum discharge temperature.

The existing / new models were ratified or created with up-to-date relief conditions on all single source relief cases and multiple relief cases. An internal review session was carried out for each model to justify its output and prioritise the warnings based on a set criteria agreed beforehand with BP.

Models and associated reports were generated as part of the deliverables to summarise the gaps and worst case relief scenarios. A closeout workshop was setup with BP for each system to assign follow up actions in order to mitigate or eliminate the gaps identified.

ABB pro-actively updated BP with the progress against an agreed schedule on a weekly basis and the financial updates on a monthly basis using earned value and conventional project management techniques.

Benefits

- Conformance with company standards
- Confirmation of the potential hazards identified in the HAZOP study
- Better knowledge of the flare system through a complete Aspen Flare System Analyser model for each flare system
- An action plan for moving forward as actions from the gaps analysis were ranked according to level of risk



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Above: Basic verification process.

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