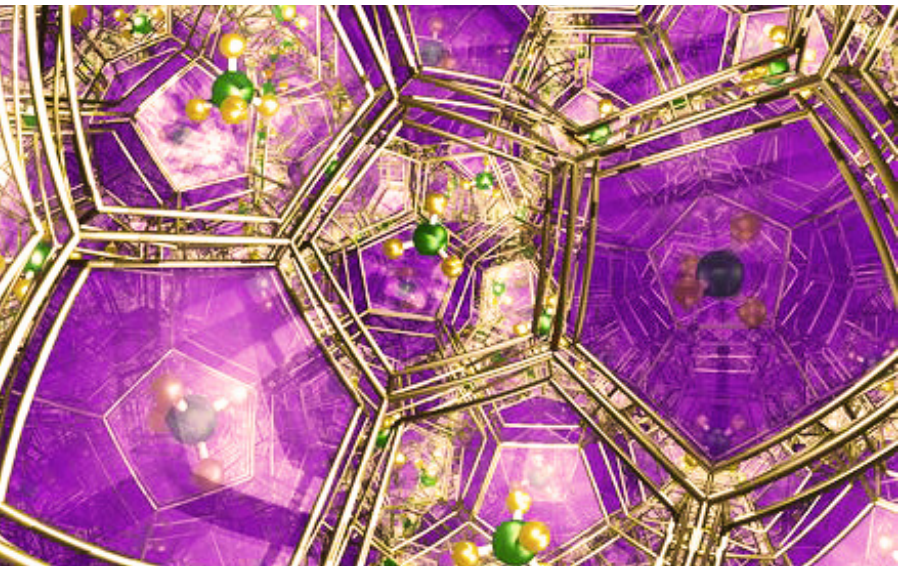
GENERAL FACTSHEET

Flare systems

Ice and hydrate assessments



Flare systems are normally designed to ensure that in the event of a relief requirement, the relieving fluid can be removed and safely disposed of by the flare system.

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Image by Mazakazu Matsumoto.

In upstream oil and gas facilities cold and wet streams are an unavoidable part of extracting hydrocarbons.

Under certain scenarios the combination of cold and wet canlead to ice or hydrate formation and this can happen in flare systems.

Historically, the flare system design has not been reviewed for the potential to cause blockages by ice or hydrates. In the event of a blockage being created by ice / hydrate formation, it may not be possible for the flare system to remove the process fluid, effectively removing the last line of defence for the facility, ultimately, the plant may overpressure, leading to escalation of the event and financial and reputational loss.

Scenario name	Original risk	Refine for geometry	New risk	Risk after moderation
.FO-13456 Trans.	High	-	High	High
.PV-13078 Nor.	Negligible	-	Negligible	Negligible
.PV-13078 Trans.	Negligible	-	Negligible	Negligible
.PV-13103 Nor.	High	-	High	High
.PV-13103 Trans.	High	-	High	High
.PV-13147 Nor.	Negligible	-	Negligible	Negligible
.PV-13147 Trans.	High	-	High	High
.PV-14060 Trans.	High	-	High	Low [1]
.PV-14145 Trans.	Low	-	Low	Low
.PV-23017 Nor.	Negligible	-	Negligible	Negligible
.PV-23017 Trans.	High	-	High	High
.PV-23080 Nor.	Negligible	-	Negligible	Negligible
.PV-23080 Trans.	High	-	High	High
Number of high scenarios	**7**	**-**	**7**	**6**

What we offer

We have the capability to undertake an ice / hydrate studyfrom relief data provided by the end user, or, if required,revalidate the relief streams prior to commencement of the ice and hydrate assessment.

As part of the process, a detailed model is built in Aspen Flare System Analyser that allows modelling of release sources as either individual releases, combination releases. Working with the operating asset, we also develop credible scenarios that are modelled to check for potential ice / hydrate formation.

The input and output from the Aspen Flarenet model is then processed using ABB's proprietary software to determine a risk ranking for the event or events being considered. Our methodology takes into account the flare system geometry, assuring that the results provided are relevant and accurate.

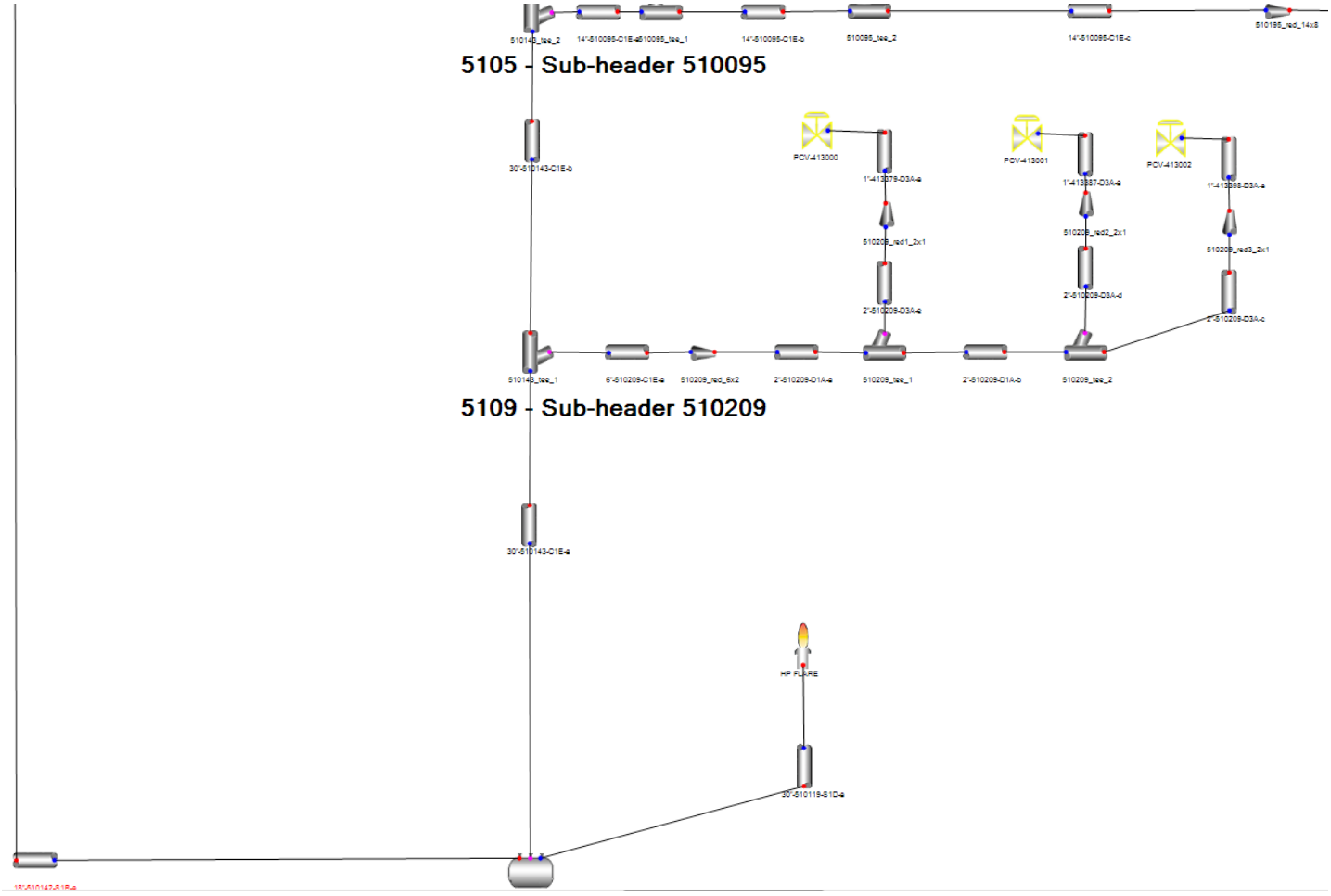
Benefits

- Focus in the areas that will make a significant difference to reduce the risk of a serious incident
- Confirmation of any major hazards identified in the study
- Assurance of safe and reliable flare operation
- Reduced risk of interrupted production

Why ABB?

ABB have developed a proven methodology for ice and hydrate assessments in flare systems and we have applied this methodology across many assets around the world.

We take a pragmatic approach to risk rank relieving sources, and relieving scenarios to allow the operator to focus on where remedial action may be required to enable safe operations.



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