

Vent stack design

Value Case Study



Safety

Project: NIA_NGGT0023
Development of AGI Safe
PEA cost: £180k
Duration: 2 years 6 months
Supplier: DNV GL
PEA benefits: £250k
Benefits realised: £84k

Background

The AGI Safe is a software package developed to perform quantitative risk assessments on a range of above-ground high-pressure gas installations, including compressor sites, pressure reduction stations and offtakes. The tool is used to assess modifications to existing installations and for new builds. The continuous management and improvement of safety risk involves the development of new tools and techniques, which in themselves impact on the risk profile of a site. The AGI Safe tool has been developed to allow the user to consider changes to site layout or additional safety features in a quick and flexible manner.

What's new?

The enhanced functionality developed by the project includes five key aspects:

- Modelling of pipework in pits
- Creation of a module to model onsite emergency shutdown procedures
- Provision for modelling 'L' shaped pipework areas and long, thin sections of pipework
- Automatic generation of escalation matrices for thermal radiation
- Provision for a user-defined assessment that can take into account local wind patterns.

The benefits

The AGI Safe tool was used to assess new vent stack designs for Peterborough compressor station. The tool was used to calculate the land required for compliance to safety zones in a number of venting scenarios. The original specification detailed that a radiation contour of 1.58kW/m² would apply. However, both the existing perimeter fence and boundaries of land needed by NGGT were outside this contour.

The team then assessed the required zones through the use of the AGI Safe tool, with the new enhanced capability on modelling thermal radiation distances. Based on this assessment, a deviation was agreed against the NGGT specification. This has resulted in reduced land purchase while still protecting site staff and the general public from site operations and the unlikely event of a gas release from the vent stacks of an ignition.

Financial savings

The purchase of an additional 2.37 acres which was required for compliance with the 1.58kW/m² contour would have incurred a cost of £84k and would have been subject to landowner consent. Further assessment established that applying the original radiation contour at Huntingdon Compressor Station would also require additional land purchase, so it can be seen that without the AGI Safe tool, existing methods could give rise to numerous instances of costly land purchase for future projects.