

Integrated
Pipeline
Solutions

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Secondary & Tertiary

Containment Enhancements

BPA's CAD design of the proposed installation.

The new, site being constructed in line with BPA's design.

Client: Shell Exploration & Production Ltd
Asset: North Walsham Gas Condensate rail/pipeline terminal, UK
Role: FEED / Procure / Project Manage EPC
Contractor: BAM Nuttall
Date: 2012 – 2016
Value: C£7M
Resources: FEED C2,000hrs
Site Management C20,000hrs
EPC Contractor C160,000hrs

Background:

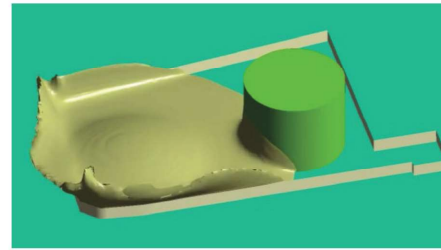
The North Walsham Terminal (managed by BPA for over 30 years) is a lower tier COMAH site. It receives North Sea Gas Condensate via an 8km / 6" high pressure (49.6 barg) cross-country pipeline from the Bacton Terminal to 2 bulk tanks storing up to 3,600m³. The product is then delivered to downstream process plants via trains of up to 18 railcars – giving a potential for over 4,000 tonnes of product on site.

The problem:

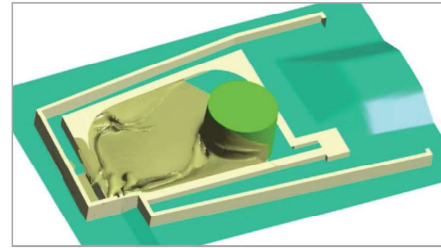
Changes to the hazardous substances regulations in 2009 dictated the need to substantially enhance the secondary and tertiary containment in order to retain the operating licence for this asset which is critical to North Sea production. While the project was implemented it was essential that the site remained fully operational at all times.

The solution:

- BPA undertook extensive liaison with the HSE and the North Norfolk District Council (NNDC) to establish basic requirements
- BPA used extensive CFD modelling of catastrophic failure scenarios to propose the solution – extensive structural walls surrounding the site with steel extensions acting as a wave return mechanism to contain product on site in the event of a tank failure
- A FEED phase then developed the solution into a practical engineering project which was then further developed through detail design into the procure / construct phase.
- BPA's team was then resident on site throughout to manage the appointed EPC contractor and coordinate activities with site operations staff maintaining pipeline and train movements



Computational fluid dynamic modelling of site before project indicates product escape from site in the event of tank failure.



Computational fluid dynamic modelling of site after project shows product contained within proposed containment system.



View of 3d model generated at detail design stage shows secondary containment tank bund with wave deflection system and tertiary containment wall.



As built construction indicating both the scale of the project, and the delivery of the proposed design.

Highlights:

- Project delivered to programme
- Project delivered under client approved budget
- Site Operating Licence renewed
- High level of front end design limited scope creep / constructability issues / cost escalation
- Strong relationship & consultation with local planners / community

Fast Facts:

- 4,800 tonnes of concrete
- 147 tonnes of reinforcing steel
- 212 tonnes structural steel
- 550 metres process piping
- 25km cabling
- Largest mobile concrete pump in UK utilised