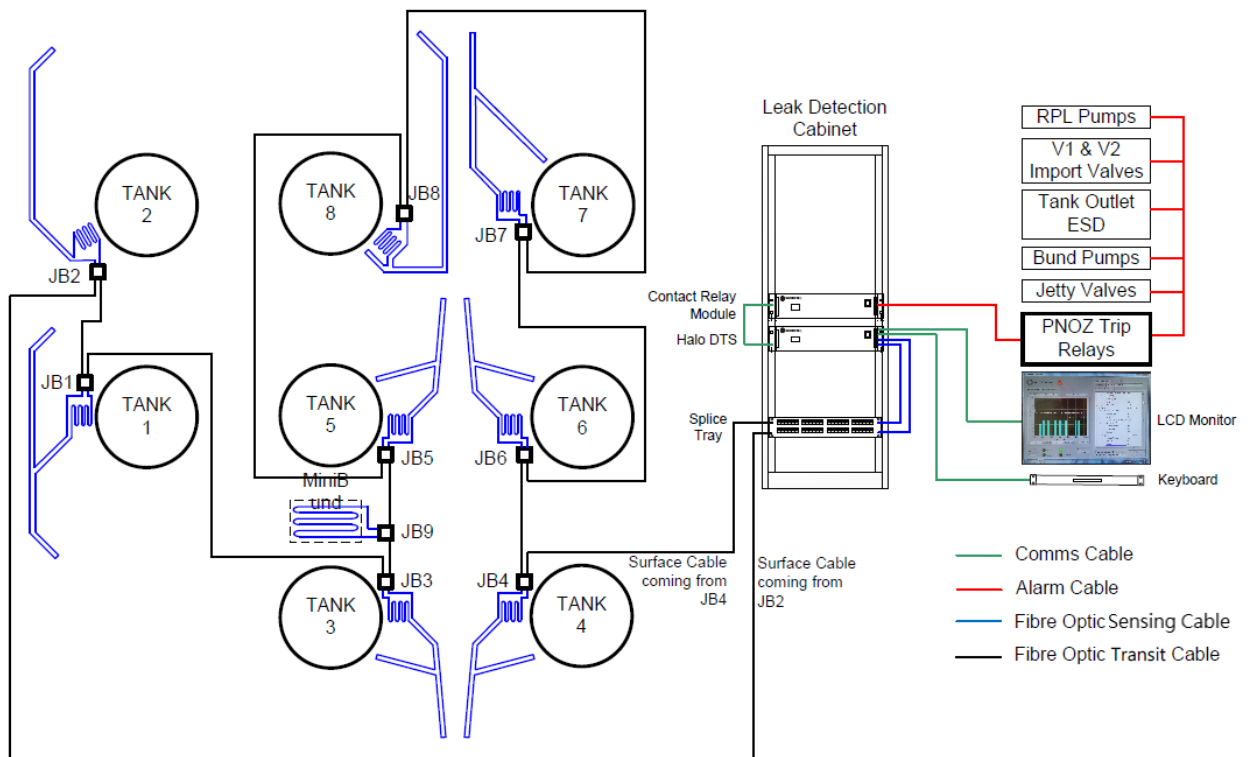




## Case Study

### FIBRE OPTIC LEAK DETECTION OF LPG STORAGE TANKS AT HISTORIC ENGLISH SEASIDE RESORT OF CANVEY ISLAND



#### THE CHALLENGE

Canvey Island in the Thames estuary was the fastest growing seaside resort in Britain between 1911 and 1951 and is notable for the petrochemical storage tanks dotting its skyline. The island was the site of the first delivery in the world of liquefied natural gas by container ship, and also influential in the assessment of the risks to a population living within the vicinity of petrochemical shipping and storage facilities, requiring the best safety instrumented systems in the unlikely event of leaks from the tank inlets.

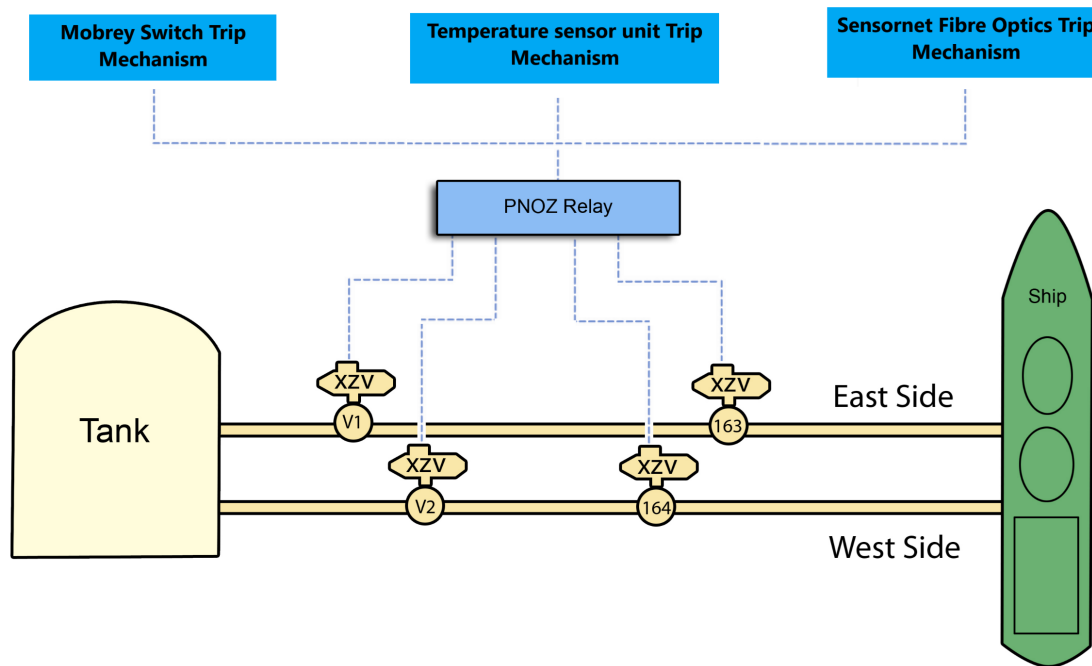
#### THE SENSORNET SOLUTION

Cryogenic sensing fibre optic cable was installed in the drip trays of the LPG tanks, along the tank spillways and in the bund basin detect Refrigerated Propane Liquid leaks as an early warning system in accordance with the requirements of IEC 61511. This meets the Tank Farm operator's SHE specifications and complies with the UK Health and Safety Executive requirements. The sensing cables detect temperature drop below  $-15^{\circ}\text{C}$  and rate of change of  $-10^{\circ}\text{C}$  to activate relays that trip the plant's emergency shutdown (ESD) system.

The Sensornet leak detection system is configured in a double loop design to ensure coverage in the event of a single or multiple component failure like a cable break. The location of the event will be displayed on the monitor in the control room for the attention of the operator. Secondly, the system is configured to perform bidirectional monitoring of the sensing fibre from two channels of the installed Halo DTS. Each of the tank drip trays, spillway and the bund basin are designated as independent zones in the Sensornet user display, with parameters and temperature thresholds unique to each specified zone.



### High Level Trip Mechanism During Importation



### BENEFITS TO THE CLIENT

The Sensornet fibre optic leak detection system offers an additional layer of protection to the conventional temperature sensors during LPG importation.

In the event of an overfill, the leak detection system will activate the PNOZ relays, thereby tripping the first stage pumps and close the main importation line valves XZV1 & XZV2 as well as the jetty import emergency shutdown (ESD) valves XZV163 & XZV 164.

Should a leak be detected from the tank's marine valves, or in the spillway and bund basin the system will automatically stop the importation by closing the valves within 60 seconds, thereby preventing any further product movement from ship to shore.

In the plant control room, the Sensornet DTS display will indicate the precise location of the leak in addition to audible and visual alarms that will alert the control room operator to the emergency.