

# eLengy

— Operating LNG terminals since 1965 —




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ALL OUR EXPERTISE  
IN LNG TANK REPAIR  
MANAGEMENT,  
AT YOUR SERVICE



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A company of  **ENGIE**



# WHY TRUST US WITH YOUR LNG TANK REPAIR MANAGEMENT?



## Innovation, passion and safety

In Elengy, we're committed to help you to solve operational problems whatever your challenges and restrictions are. Whether you're an operator of onshore or offshore LNG tanks, or a LNG pumps manufacturer, we pride ourselves on offering solutions tailored to your individual needs.

## More efficient diagnostics

Our cameras and lighting equipment are designed to diagnose performance issues and failures from a nozzle or even inside your tanks. So we can get to the root of the problem and devise a solution without decommissioning faulty tanks.

## Support for modeling phenomena

We offer across-the-board support for modeling phenomena like the ageing of LNG, the dispersion of gas plume in the atmosphere and the follow-up of the key parameters.

## Solutions tailored to your needs

We'll work with you to design tailor-made and innovative solutions to repair or modify your internal equipment. We'll listen, learn and work in tandem with your teams.

## The best safety and operating procedures

We take safety and operation procedures very seriously. We'll handle all preparation to determine the scope of work that needs to be undertaken and define all follow-up parameters.

## Project management and implementation

We offer comprehensive project management and work in close collaboration with operational teams and services providers.

## OUR ACHIEVEMENTS SO FAR...

We've been operating LNG terminals since 1965. In that time, we've gained extensive experience in managing sensitive observation, repair or modification projects inside LNG tanks. We've also developed a range of techniques that have been performed under

very demanding operational conditions like air, nitrogen or cryogenic atmospheres. The nature of each implemented solution is decided in accordance with the type of tank that needs to be repaired.

- 1975** Repair in nitrogen atmosphere on a single containment tank.
- 1987** Repair in air atmosphere on two single containment tanks.
- 1990** Support for the decommissioning of a tank in Algeria.
- 1991** Repair in air atmosphere on a tank (propylen).
- 2004** Repair in air atmosphere on two membrane tanks.
- 2009** Support for the repair of a single containment tank, Trinidad & Tobago.
- 2013** Repair in cryogenic atmosphere on a single containment tank.

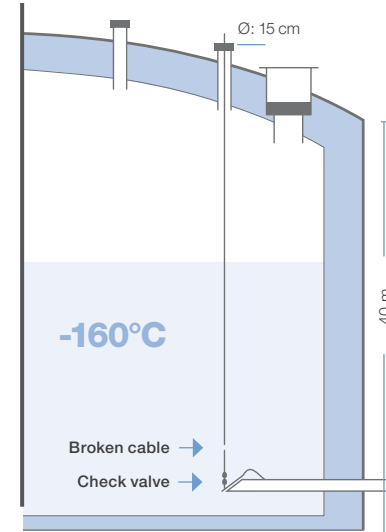


Preparation for the first entry in the LNG membrane tank of Montoir-de-Bretagne (2004)



## CASE STUDY

# ONE OF OUR MOST CHALLENGING REPAIR...



Sectional view of the Fos Tonkin LNG single containment tank with the check valve activated by a cable

## Extreme conditions

Besides the atmospheric difficulties due to the cold, we had the added challenge of repairing the failing device from a nozzle of 15 cm placed on the roof of the tank at around 40 meters above ground.

## Tailor-made tools

Together with teams at COMEX and INTRO-VISION, we developed new and bespoke tools: external and in-tank cameras with their associated lightning system (a), grinding device (b), prehensile and hooking equipment (c).



## The Fos Tonkin project - a world first

In late 2012, an LNG tank at Fos Tonkin terminal was taken offline because of a serious fault. The reason: a cable activating the check valve at the end of the main LNG pipe had broken off, leaving the isolating device in a shut position. After considering different options, Elengy decided to fix the internal equipment in Cryogenic atmosphere - i.e at a temperature of  $-160^{\circ}\text{C}$  - and a pressure of 3 mbar. This meant that we could carry out our repair work without decommissioning and recommissioning the tank.

We trialed our tools on a representative model, drowned in liquid nitrogen, as well as on the outside of another 40 meters tall tank. After successful completion of a test run, we also installed a platform on the top of the tank and a positioning table for guiding the tools.

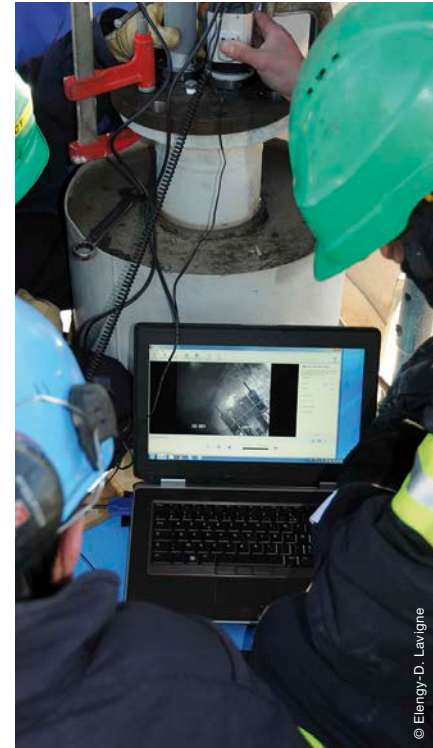
## A successful operation and a world first

The repair operation went extremely smoothly and was managed to the highest safety standards. We managed to grip, cut and extract the cable, then install a new one, all within a week. And in March 2013, three days after the operation, the tank was back online.

## Benefits and learnings

Repairing the valve in cryogenic conditions proved to be safer and eliminated the risk of tank damage caused by potential expansion. It was also less expensive and less disruptive to the operator than other solutions that would have involved decommissioning and recommissioning.

This challenging repair is a great example of Elengy's expertise and commitment to implementing innovative solutions while always adhering to the strictest safety conditions.



Observation of the check valve with a camera from a nozzle located on the roof of the tank

**Repairing in cryogenic conditions is safer, faster and less expensive.**

In partnership with



Two operators lowering and positioning the tools from a table during the repair of a LNG tank at Fos Tonkin (2013)

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Operator of LNG terminals since 1965

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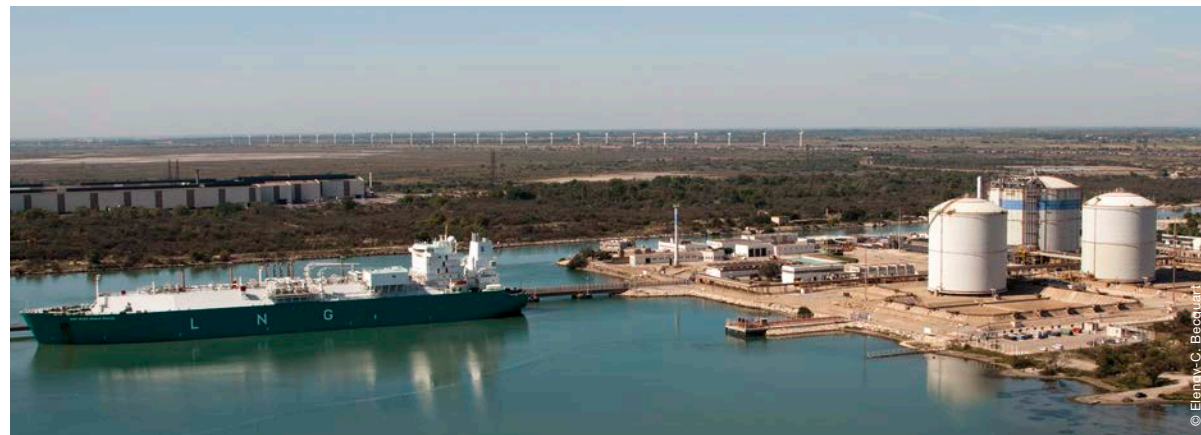
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## Our values

- drive
- commitment
- daring
- cohesion

A company of

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