

## REINFORCING A HIGH PRESSURE TRANSMISSION NATURAL GAS PIPELINE TEE



Natural gas transmission pipelines are elements of critical infrastructure which should be monitored on an ongoing basis. Pipes, valves, gas regulators and other components that are operating under high pressure (up to 100 bar) are often located underground and are exposed to factors such as corrosion, humidity or sudden changes of temperature, but also threats related to the current operation of the pipeline, such as vibrations. In this case a pipeline on the border of Europe and Asia showed a high level of degradation in the welded joints on the tees at several block valve stations (BVS). This defect could lead to the crack and leakage of the installation and, as a consequence, to a gas explosion, so a fast and thorough repair was needed. CTE BV was asked for a suitable solution.

### CHALLENGE

Engineers from CTE BV received an inquiry for the possibility of repair work with composite materials on a working installation - a repair performed without the need to take the installation out of service.



The subject of the repair was a welded joint on a reducing tee (reduction from 18 inches - 2 inches). The tee was made of carbon steel and operated at an elevated value of operating pressure of 90 bar with a maximum design pressure of 95 bar. The large difference in the diameters of both pipes is a significant obstacle in the repair process.

### REASONS TO CHOOSE CTE BV:

- Fast suitable solution
- Overall costs
- Long term improvement
- Valued relationship of over 10 years



### SOLUTIONS USED

- RevoWrap110  
Composite system



### REPAIR

After the intensive dialog between engineers, the repair technology was presented to the customer. The pipeline surface was prepared with sandblasting, and the roughness of the surface was carefully measured prior to proceeding with the repair. Due to the big difference in pipeline diameters, it was necessary to use a special way of wrapping: axial patches mixed with circumferential wrap. Because of the high pressure in the pipeline, the repair was conducted with the use of a high number of layers of epoxy-based engineered carbon-fiber material **RevoWrap110**.

The certified supervisor/trainer of CTE BV was sent over to the repair location in order to educate and support the local contractor. Thanks to this, the repair not only strengthened the welded joint but also extended its service life, in accordance with the international technical standard **ISO 24817**. After concluding the repair at one block valve station in the presence of the trainer, the local maintenance company conducted eighteen repairs at the other stations. The costs of material and installation turned out to be the lowest of all discussed repair alternatives.

**Thanks to all of this, the solution resulted in a lasting repair and a high return on investment.**

**WANT TO KNOW MORE ABOUT OUR SOLUTIONS? PLEASE FEEL FREE TO CONTACT US.**

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