

## REPAIRING A LARGE CARBON-STEEL PIPE WITHIN 24 HOURS

JANAF D.D. (Jadranski Naftovod d.d.) provides transport and storage of crude oil and petroleum products. The company, headquartered in Zagreb, Croatia, manages an oil pipeline and storage system as a modern, efficacious and cost-efficient system. The system managed by JANAF D.D. is recognized as one of the EU strategic oil pipelines and is a crucial part for refineries in six countries in South Eastern and Central Europe. Due to human errors in the welding process, there was a 100% wall loss situation (leak) that needed urgent repair. CTE BV came up with a solution within 24 hours.

### CHALLENGE

JANAF D.D. uses a 28-inch carbon-steel pipeline. The crude oil is transported under a pressure of 49.4 bar. At some point in time, external corrosion caused a 100% perforation. This could be temporarily patched by installing a steel sleeve with a length of 1000 mm. Unfortunately, the welding was done directly over the affected area. A human error which ultimately resulted in a complete wall loss and a leak under the steel patch.

Closing or slowing down such an important transport pipeline would lead to losses and negative side effects to the products such as clumping that can cause blockages. Most importantly, a leak can cause damages to the environment. Hence, a fast solution was required.

Besides a fast repair, JANAF D.D. was also looking for a sustainable solution in order to extend the service life of the pipeline.

### REPAIR

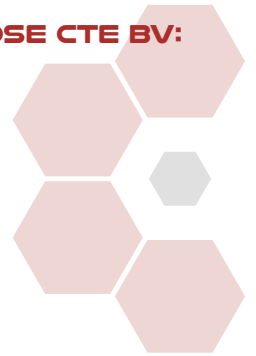
As soon as CTE BV was called to the rescue, the team in the Netherlands prepared the technical solution according to the engineering standard **ISO TS 24817**. Materials were prepared directly after the customer confirmed the repair procedure. In the afternoon the material was picked up by a courier and transported to Zagreb overnight. The pressure in the pipeline was minimized to a level that caused no more leakage so that the pipe could be wrapped. After sandblasting the steel sleeve and pipe, the **DiamondWrap® epoxy-based carbon-fiber engineered repair solution** could be applied.

The large pipe with a large affected area demands quite a number of layers. The technicians made 6 applications of 4 pieces of half-metre wide carbon cloth to create a 12-layer repair covering the steel sleeve over a length of 180 cm (70 inches). The repair was done by four technicians from JANAF D.D., three from sandblasting specialist Kontus DOO and one supervisor from the AlpAccess company, the local CTE BV contact. Before midnight the repair was installed and had cured. The pipe was running again.

The repair cost JANAF D.D. a minimal amount compared to the millions of dollars as a consequence of an unplanned shutdown or the environmental pollution caused by a leak. On top of that, the infrastructure safety has been increased due to the repair, because the composite repair reinforcement has a design lifetime of 20 years. **Thanks to this success, the project led to further inquiries for other improvements.**

### REASONS TO CHOOSE CTE BV:

- Fast solution
- Overall costs
- Long term improvement
- Good reputation
- Safety (no hot work)



### SOLUTIONS USED

- **DiamondWrap®**  
*engineered carbon-fiber epoxy based system*

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

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