

## REPAIRING AN ACTIVE NATURAL GAS CARBON STEEL PIPELINE IN FREEZING WEATHER CONDITIONS



MinskOblGaz is the gas distributor for the district area of the capital of Belarus. With pipelines over 10,000 km, serving over 565 thousand houses and 1400 businesses, it's one of Belarus' largest and most important infrastructural organizations. In the recent wintertime, a 4 mm through-wall defect was discovered in a pipeline supplying natural gas to a huge power plant as a result of a degradation of a welding joint. Urgent repair was necessary as the risk of explosions were severe, but the working conditions were harsh and there was no possibility to temporarily shut down the pipeline. CTE BV offered a fast and secure engineered solution to repair the leak according ISO TS 24817.

### CHALLENGE

Considering the characteristics of the situation this was a challenging task. Due to the nature of the damage, a live leak, and the product being transported (natural gas) no hot work was permitted, and circumstances were dangerous. Shutting down the pipe was no option, the temperature outside was -4 C and there was only about 6,5 hours of daylight.

The leak was discovered by the gas inspection team. The 720 mm pipeline above ground showed several weak points at the girth welds. A result of insufficient quality of welding; each 12 meter section of pipe needs to be welded, but this was not the case here. A 4 mm pinhole directly at the welding joint was found and leaking gas. As a first measure, textile straps and rubber patches were used, but this was not working at all because of the size of the leak and other circumstances.

### CTE BV WAS CALLED TO THE RESCUE, BASED ON THESE CRITERIA:

- Able to offer a solution with crucial safety measures
- Keep cost low with projected budget
- Fast delivery of long term solution
- Proper tools and experience level
- Full project support - from engineering calculations to service after repair

### SOLUTIONS USED

- Steel clamp  
*leak sealing solution*
- DiamondWrap®HP™  
*carbon fiber epoxy based system*



### REPAIR

The leak was repaired using **DiamondWrap®HP™ carbon fiber system** and a **leak sealing steel clamp**. First, the clamp and silicone rubber pad were applied to seal the leak. After this, the surface was prepared for long term repair. By applying epoxy putty and the 500mm width composite repair solution the welding joints/girth welds were reinforced. Due to the outside temperature of -4 C, this was done inside a special tent to create an environment with the needed minimum temperature of +10 C. The tent remained on the pipe for another eight hours with heating inside to let the composite materials cure properly.

The repair was done by two trained technicians from BelKotloOchistka, the official CTE BV dealer in Belarus, under the supervision of a CS engineer and a quality inspector from MinskOblGaz. In only 4,5 hours, the repair was successfully completed.

**A successful project that led to the repair of the leak, but also led to a new agreement for the repairing of 150 welding joints using the same technology.**

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

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