GC WRAP

CASE STUDY

Documentation of the repair of the transmission pipeline, made with composite materials
REPAIR OF INTERNAL CORROSION ON THE HIGH PRESSURE GAS PIPELINE DN 150

REPAIR TECHNOLOGY DEVELOPED BY AN INTERNATIONAL TEAM OF ENGINEERS

EFFICIENCY

GC Wrap is the highest quality fiberglass and carbon fiber systems used to rehabilitate and restore the original working strength of damaged or corroded transmission pipelines and pressure vessels. With full compliance to ASME PCC-2 and ISO TS 24817 technical standards, service life extensions are possible up to 50 years.

PIPING PROTECTION

GC WRAP can be applied on tees, elbows, and, of course, straight runs of pipe, in confined spaces and on irregular surfaces – wherever structural reinforcement or leak containment is required. The adhesive properties of the urethane and the use of an epoxy primer allow it to be applied to most substrates.

COMPLIANT TECHNOLOGY

GC Wrap is compliant to the ISO TS 24817 technical standard, ASME B31, .8, .4, .G and PCC-2 Art. 4.1, 4.2. as well as API 570. Please refer to: API 570, Section 8.1.4 – Non-welding repairs (on stream). The repair technology with composite materials is approved by the UDT.

PROBLEM

Operators of natural gas pipelines conduct regular inspections of the technical condition of the infrastructure. The protocols, which are the result of the inspection, are then analyzed in order to select the technology for repairing the pipeline or replacing the section in question (cutting and welding). In the case in question, as a result of non-destructive testing of the pipeline, wall thinning worth 30% of the wall thickness was detected - internal corrosion on the bend of the pipeline with a diameter of DN160 mm within the weld occurring over a length of 300 mm.

APPLIED SOLUTION

After analyzing the protocols, the decision was made to use GC Wrap series composite materials to repair this defect. According to ISO 24817, the length of the repair muffle was calculated to be 300 mm and a thickness of eight layers. However, after exposing a section of the pipeline and conducting an additional test with an ultrasonic inspection instrument, it was found that the loss of wall thickness occurred along the entire length of the bend, i.e. a distance of about one meter. After consultation with the technical department of Gascontrol Polska sp. z o.o., a new calculation was made and the length of the muffle was changed to 1200 mm. Afterwards, sandblasting (surface preparation) was carried out and the application of composite repair materials proceeded. It is worth mentioning that the repair was carried out under very low temperature conditions (+2C). To ensure proper conditions for the application and polymerization of the composite materials, a tent was installed over the trench and the repaired section of the pipe was additionally heated using special mats.

RESULT

In less than three hours, surface preparation (sandblasting) was performed and then the fiberglass repair muffle was threaded. Thanks to the use of reheating mats, the same day the following was threaded C50 grade tape insulation. The next morning, a poroscope test was performed and the repair was completed. The use of composite repair materials was the best repair option for the case, which further extended the life of the pipeline for 20 years.

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