

Wrinkle Bend Repair in Canada

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Pipe Details

- Liquids Pipeline Operator
- 10" pipe diameter
- 725 psi design pressure
- Crude oil pipeline
- Wrinkle Bend

Summary

Inspectors for a liquids pipeline operator in Canada found a wrinkle bend on a 10" crude oil transport pipeline. The operator could not afford to shut down the line to cut and replace because of the high transport volume through the pipe. A welded sleeve could not be used because of the odd configuration of the anomaly. Pictures of the anomaly are below.

CSNRI team of project engineers designed a repair for the wrinkle bend defect according to ASME PCC-2 Article 4.1, and recommended a DiamondWrap® (now [Atlas™](#)) repair solution. 6 layers of DiamondWrap® were required to repair the defect.

CSNRI had previously teamed with the specified contractor on previous Canadian DiamondWrap® repair opportunities, and the contractor already had several trained and certified installers. This partnership with the contractor saved the pipeline operator time and money as they did not have to call out two separate service companies to perform both the dig and the installation. The repair also did not require the high cost of welding labor. The high compressive modulus filler putty was installed to smooth any stress concentrations around the wrinkle bend as a material to transfer the load from the pipe to the carbon fiber repair system. The primer was installed next to increase the bond between the repair and the pipe. 6 layers of carbon fiber were installed over a 1 meter repair length to repair the wrinkle bend defect.

Two trained technicians were able to complete the installation within approximately two hours. No heavy equipment or hot work was required for the installation, and the line remained in operation during application. The repair was installed and cured within a half of a day, allowing the pipeline operator to quickly and efficiently move on to future digs. Below are photos of the completed repair and repair process.

This crude oil pipeline remained in operation during the repair installation and curing. The pipeline operator was very happy with the fast design and installation implemented by CSNRI and their trained Canadian contractor. As a result, DiamondWrap® has become the pipeline operator's repair of choice for future pipeline anomalies.

High compressive modulus load transfer epoxy used to smooth anomaly



Completed repair

