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# UTILITY & GAS APPLICATIONS

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COMPOSITE PIPE  
REPAIR SHOWCASE





COMPOSITE PIPE REPAIR

# NITROGEN-FILLED FEEDER PIPES



## AGING PIPE CARBON FIBER REINFORCEMENT

A major utility provider needed to repair aging nitrogen-filled feeder pipes. The project involved 130 feet of vertical 8 inch pipe that transported nitrogen over a bridge. The original coating contained hazardous material. To limit the amount

of coating abatement required, the repair was applied with 3 foot adhesion zones every 35 feet of pipe. The resulting permanent repair could withstand pressures beyond the required 250 psi to return the pipes to service.

CF-500 BD - FRP Repair Putty - FRP 120 HT - HP-300 Epoxy

COMPOSITE PIPE REPAIR

# COKE OVEN GAS (COG) BYPASS LINE



## HIGH-STRENGTH, HIGH-TEMPERATURE LEAK REPAIR

A coke oven gas (COG) bypass line had a through-wall failure at an elbow. The pipe was left in service for several years, accumulating a large salt deposit and further degrading the pipe wall. The stainless-steel pipe had to be repaired to

prevent dangerous gases from escaping. The leak was sealed with wooden wedges, then buried in an epoxy putty. A high-strength, high-temperature carbon fiber reinforcement system was applied to the exterior of the pipe section.

CF-500 BD - FRP 211 HT Saturant - 110 HT Tack



COMPOSITE PIPE REPAIR

# REFURBISHMENT OF NATURAL GAS TRANSMISSION LINES

FRP Repair Putty - GF 300 BD - CF 500 BD -  
Sat 210 HT - HP 300 Epoxy



## LARGE SCALE PROJECT

Advanced FRP Systems assisted a utility provider with repairing 600 linear feet of 24" pipeline in 6 weeks.





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# Effective Repair for Externally Corroded Pipeline

### QUICK, EFFECTIVE SOLUTION

A major utility provider needed to repair badly corroded pipe and pipe supports for a natural gas main transmission line. The pipeline needed to be repaired quickly because the natural gas was essential to heating homes during a peak-demand season.

Advanced FRP System's experience and expertise combined with third-party, independent testing factored into the recommendations for installing a composite repair system on the pipeline. The proven benefits of composite repair, including high-strength, long-lasting, maintenance-free performance, allowed the operator to return the main line to service after the repair was completed.



### EFFICIENT APPLICATION

Advanced FRP Systems worked closely with an experienced contractor to apply the repair system elements. After grit blasting the line, repair putty was used to repair the degradation of the weld seams and pitting on the pipeline. Then, four layers of bidirectional carbon fiber composite repair were applied and coated with an epoxy coating.





## COMPOSITE PIPE REPAIR

# DIELECTRIC FLUID LEAK REPAIRS



### HIGHLY EFFECTIVE LEAK REPAIR

A major utility provider used composite systems to repair dielectric fluid leaks and increase the availability and reliability of its transmission system. Areas of corrosion on approximately 2,000 linear feet of HPFF (high-pressure, fluid-filled) pipe-type cables were

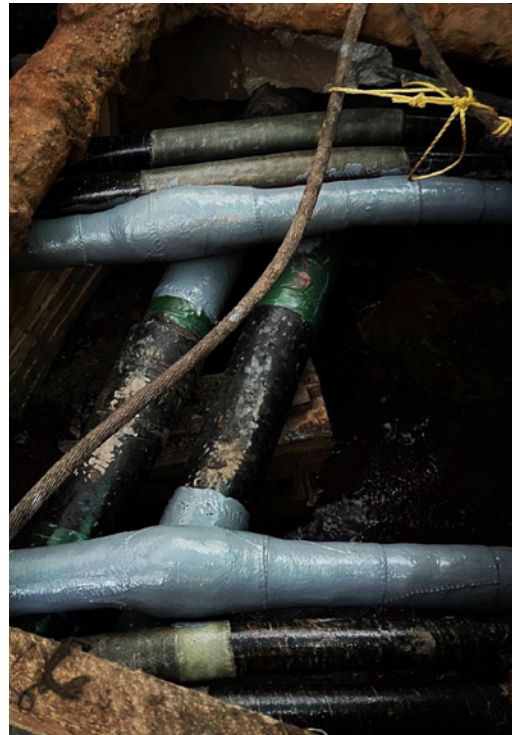
repaired and/or reinforced by installing a carbon fiber composite system on feeders and return lines. The repair utilized adhesion zones, reducing the amount of coating abatement required and resulting in a highly efficient, highly effective composite repair.

CF-500 BD - FRP Repair Putty - FRP 120 HT - FRP 210 HT  
GF-300 BD - HP-300 Epoxy



COMPOSITE PIPE REPAIR

# PERMANENT REPAIR FOR COPPER, PIPE-TYPE CABLES



## REPAIR FOR COPPER PIPE WITH LOW CLEARANCE

A dielectric fluid leak was found in several small-diameter fluid-filled feeders near a substation. The pipe-type cables had a copper outer pipe and very low clearance around each pipe. A typical welded sleeve or clamp could not be used because of

the tight clearance. After a temporary leak stop was installed, six layers of high-strength carbon fiber were wrapped around the pipes. This six-layer system provided a permanent repair for these copper, pipe-type cables.

CF-500 BD - FRP 200 Saturant - Repair Putty -  
HP 300 Epoxy - FRP 120 HT



COMPOSITE PIPE REPAIR

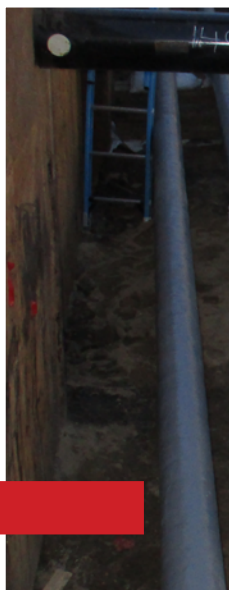
# LARGE SCALE REPAIR FOR HPFF TRANSMISSION CABLE SYSTEM

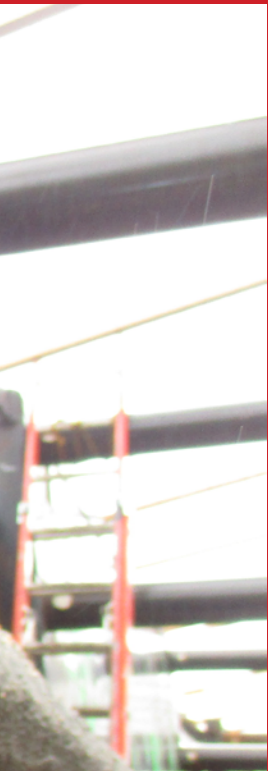
POWER TRANSMISSION



## MAJOR UTILITY PROVIDER REQUIRES CORROSION SOLUTION

A major utility provider needed a proactive solution for corrosion on its high-pressure, fluid-filled (HPFF) transmission cable system. Much of the old coating had asbestos-containing material, which required a strategic and efficient surface preparation method.





**06**

## **Adhesion Zones**

### **REDUCING COATING ABATEMENT EFFORTS**

The composite repair system used 3-foot adhesion zones for every 100 linear feet of pipe, decreasing the required coating abatement by more than 90%. The pipe sections between adhesion zones were encapsulated by a structurally independent carbon fiber composite system.



### **COMPREHENSIVE TRAINING**

Advanced FRP Systems provided comprehensive training for the project over 5 days. The training included a combination of classroom and hands-on training with written and practical exams to ensure competency and comprehension.





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