

# CASE STUDY



**DOWAKSA**

## *Repairs Complete Despite Rising Tides and Rainstorms*

### **Innovative Engineering Restores Seawater Discharge Pipe**

#### **Challenge**

A large chemical company on the U.S. Gulf Coast utilized seawater for plant cooling, but the decades-old cast iron recirculation pipe was corroded from the seawater and leaking badly. There was a large crack where the pipe was embedded in a concrete wall as well as multiple interior cracks on the pipe that was inside the wall, making repairs technically challenging. Plant personnel had made temporary repairs to stem the leaking but, long-term, they were faced with tearing out the wall and replacing all the piping – a solution that would have required shutting down the unit for weeks.

#### **Solution**

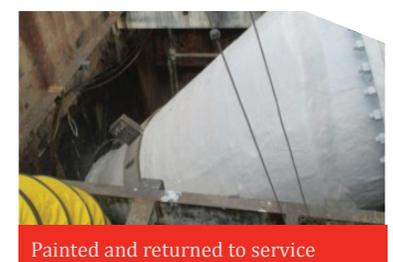
DowAksa offered a less disruptive – and less costly – alternative. First, the exterior of the pipe was pre-wrapped with carbon-fiber fabric. Then, because of the awkward location of the embedded pipe, polymer concrete was poured into a customized form that encased the original pipe. This was the first time this method was used, but the flexibility of the technology enables such customization and the results proved very effective. The formed polymer concrete was then wrapped with 10 layers of carbon-fiber-reinforced fabric – basically creating a second, stronger pipe around the original patched pipe. Finally, a stainless steel clamp was added for additional support to enable the routine maintenance of the pump in the future.

The repairs were further complicated by the fact that much of the work could only be completed during low tides. To prevent additional delays due to a number of local rainstorms, the contractor constructed a tent over the work area.

#### **Results**

Following plant protocol, the restored pipe was tested under high water pressure to check for any leaks that might occur when put back into service. All seals held tight and continued to show good results one year later (at the time of this publication).

Using the CarbonWrap® system saved the plant owner about \$130,000 in technology costs compared to alternative options. And no shutdown of the station was required during the repair project.



## More About the Project

The plant maintenance leader liked the technology so much, he proposed using it for repair of the entire concrete piping system throughout the plant.

Project Details	
Type of structure	Seawater discharge pipe
Structure owner	Large chemical company
Structural engineers	In-house engineers
Prime contractor	Not applicable
Key subcontractors	Site-approved contractor
Date of project completion	July 2015
Project scope	Repair and restoration of one pipe and supporting structures (wall and pedestal)
Substrate materials	Cast iron pipe Concrete wall and pedestal
Cause of damage/degradation	Seawater corrosion
CarbonWrap® systems installed	PolyCon™ 500 polymer concrete CarbonWrap® CFU10T lightweight, unidirectional carbon fabric
Application methods	Prewrapping, overwrapping, customized form
Testing: type, results	Passed all plant safety checklist protocols

**“I would  
definitely rate  
this technology  
a 10 on a scale  
of 1 to 10.”**

- Plant maintenance  
leader

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