Quest inspar
Pipeline Life Extension Specialists

CASE: ELEVATED COOLING WATER MAINS

SUBJECT

Rehabilitation of Closed Cooling Water System– Coal-fired Generation Station

Recirculation Pipeline*: PipeArmor® 150SW*

When Tucson Electric Power (TEP) took its Unit #4 at Springerville Generating Station (1560 MW) off-line for maintenance, it was apparent that some of the elevated 24-inch closed cooling water piping and 16-inch exchanger drops were experiencing severe corrosion. A durable barrier against leaks and further corrosion was required.

Process Environment

Use	Closed Cooling Water Piping in a Power Plant
Process Temperature	120F
Operating Pressure	30 psi

Serviced Pipeline

- 234 linear feet of 24-inch and 136 linear feet of 16-inch Carbon Steel pipeline was rehabilitated utilizing PipeArmor® Manufactured-in-Place Pipe™ polymer liner.

Challenges

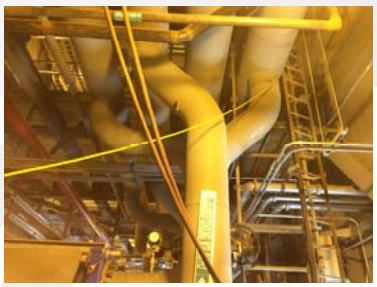
- The corroded pipeline sections contained a number of 90 & 45-degree bends, mitred elevations, tee drops, and vertical offset 90 ell risers. These are figurations that not able to be structurally-lined with other available technologies.

Solution and Process

- The deteriorated pipe section was pneumatically pigged to an SSPC SP2 level of cleanliness. A camera inspection was conducted to assess the condition post-pigging
- The elevated pipe sections and drops were lined robotically in-place, with exchanger connections similarly lined in a removed state. The PipeArmor® polymer liner was installed in a single pass at a .0.196” (5 mm) to .0.236” (6 mm) uniform thickness, followed by installation of stainless steel expansion bands at all lining terminations.

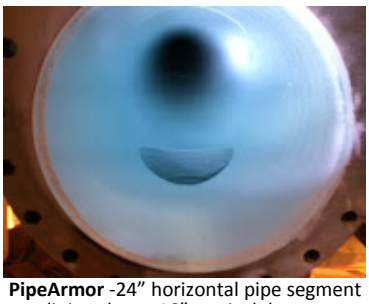
Findings / Results

- Plant engineers inspected the pipe sections lined with PipeArmor® and the system is now reinstated to full service.
- Time and funding to reinstate the elevated closed cooling system were significantly reduced by the robotic lining with PipeArmor™ process, as the only alternative was to completely replacing the piping system with new factory lined pipe.



System Complexity: Some of the elevated systems with 16” drops to exchangers

Robotic versatility – Left: Completed 45 deg. mitre into unit. Right: SD1 robot makes insertion for vertical lining segment.



PipeArmor -24” horizontal pipe segment post lining shows 16” vertical drops to heat exhangers