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**Foundation
Technologies, Inc.®**

INTRODUCTION

Refineries process a wide variety of petroleum products. As part of the process, they rely on cooling towers, which recycle water throughout the plant. Twelve of the Steel Riser Pipes showed signs of below grade water leakage and in response the refinery scheduled an engineering survey to determine the cause of the problem.

PROBLEM

The engineering survey showed that a high percentage of steel on the pipes had corroded resulting in pitted areas and ultimately water leakage. The pipes were 3/4 inch thick. Given the extent of the damage, several solutions were considered including: replacement, welded steel, and HJ3 Carbon Composite System. The Project Engineers specified HJ3's Carbon Composite System because it offered savings of 50% to 75% over alternative methods and 400 psi strengthening to the existing pipe. In addition, the system could be installed within 5 to 7 days with no resulting down time.

INSTALLATION

The steel riser pipes were first excavated to a depth of 10 feet and the mortar surrounding the pipes was removed to access the steel surface. An abrasive blast was performed to clean the pipe to a white metal finish with a 3 mil profile. After surface preparation, 2 layers of HJ3 CF528 carbon fabric were saturated and applied to the damaged pipe area.

CONCLUSION

In total, 12 steel riser pipes were repaired and strengthened with the HJ3 Pipe Repair System. The total installation was completed over 7 days and resulted in 50% cost savings for the client over Steel Clamp Repairs or Replacement. The main advantages of the HJ3 Carbon Composite System were as follows:

- 10 x Tensile Strength of Steel
- Corrosion Resistant
- Installed in the presence of moisture
- Impermeable to Pressurized Water
- Speed of Installation
- 50% to 75% Cost Savings over Alternatives – Including Replacement



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