Project Overview

CARBON FRP RETROFIT OF CONCRETE PIPES IN NUCLEAR POWER PLANT

Name: Nuclear Power Plant
Type: Industrial Facility
Location: Classified/ Confidential
Completed: September 1999

PROBLEM

A major Nuclear Power Plant in the U.S. uses 9-ft diameter Prestressed Cylindrical Concrete Pipes (PCCP) to carry water throughout the plant. Inadequate cover concrete caused corrosion of Prestressing cables in many pipes. Replacement of the pipes required significant downtime that was unacceptable to the plant operators.

To minimize downtime, excavation was not desirable, so a repair system had to be designed to repair the concrete pipes from the inside.

SOLUTION

QuakeWrap, Inc. developed a very strong biaxial carbon fabric through the PipeWrap™ division. The FRP fabric was specially designed and manufactured for this project to allow repair of the pipes from inside in record time and to withstand the high internal design pressures.

The nuclear power plant set up field tests of the FRP retrofitted concrete pipe and the tests were stopped when the internal pressure exceeded the original design value. This proved that the FRP repair system could also be used as a strengthening procedure.

Technical Highlights

- Client is a major nuclear power plant in the United States
- 9-ft. diameter PCCP pipes were damaged by corrosion of pre-stressing cables

- o 11,500 ft² of PipeWrap™ used
- o Fabric specially designed for high 0/90° biaxial strength
- o Applied QuakeBond™ corrosion-resistant resin for further protection