FUTURE PIPE INDUSTRIES

CASE STUDY

PROJECT
Ras Laffan Common Cooling Seawater System (Phase II Category 1 & 2)

LOCATION Ras Laffan Industrial City, Qatar	**PRODUCT** FIBERSTRONG®
CONTRACTOR Dodsal (phase II category 1) Consolidated Contractors Group – CCC (phase II category 2)	**END USER** Qatar Petroleum
CONSULTANTS/PIPE SYSTEM DESIGNERS ElectroWatt and Dynaflow International	**DESIGN PRESSURE** 6 Barg
DIAMETER RANGE (MM) 150 to 3450	**APPLICATION** Seawater Cooling Lines
MARKET SEGMENT Oil & Gas	**COMPLETION DATE** 2008

DESCRIPTION
The Ras Laffan Common Cooling Seawater System Phase II is a development undertaken by Qatar Petroleum to provide cooling water supply to industries located in the Ras Laffan Industrial City in Qatar.

FPI manufactured and supplied the above ground and underground seawater cooling lines, fire water, potable water and chlorination pipe systems. This is the largest single project in fiberglass pipe with 80 kilometers of DN 3450mm pipes installed above ground.

FPI'S SCOPE INCLUDED:
- Engineering, isometric drawings, BOM, stress analysis, FEM and support design
- Fabrication and spooling of customized fittings
- Extensive qualification testing
- Packing and delivery to the site
- Documentation, method statements and project management
- Training, installation, testing and commissioning supervision and technical advisory

THE FPI ADVANTAGE

The FPI fiberglass pipe system was designed and manufactured in accordance with the ISO14692 code with the below approximate quantities:

- 80 kilometers of GRP from 700mm up to 4000mm for all seawater cooling lines
- 25 kilometers of GRE/GRV from up to 600mm for the seawater, firewater and potable water lines

In 2002, Phase I of this project, built from glass flake lined carbon steel pipelines, proved its incapability to sustain the highly corrosive environment of the seawater medium and developed a high rate of leakage throughout the pipe length during its installation and commissioning.

The client, Qatar Petroleum (QP), then needed to explore the use of alternative materials such as fiberglass and executed that in the Phase I Extension project. The project was completed by M/s CCIC in 2006 involving around 18 kilometers of GRP pipes in diameters up to 2800mm, supplied by FPI. To everyone's expectations, the GRP pipe system successfully proved its performance for the project design parameters.

Following the success of the above project, QP instructed M/s. Technip during the FEED stage of Phase II Category I project to consider two options for the pipe material selection: ''Glass flake lined carbon steel'' and ''GRP''.

Both QP and Technip exercised extensive studies, design analysis and value engineering on the two options to make a final decision. Finally GRP was selected as the material of choice for their application.

The final decision by the client was based on the GRP's inherent capabilities to resist the severe corrosive conditions associated with the high gulf temperature, particularly for such service and above ground application, without the requirement for any coating, lining, painting or other protection methods.

Other vital advantages of GRP which supported the selection were its light weight, ease of handling & installation and lower energy/pumping cost due to its smooth inner lining.

All the above GRP pipe characteristic and properties led to the fact that GRP has a much lower installation and life cycle cost as compared to lined carbon steel pipe system, and hence the final decision to use GRP for this phase and the upcoming phases of this project and eliminating the carbon steel option.

The client, acknowledging the exceptional GRP/GRE pipe properties and advantages over the carbon steel, needed a reputable company with a vast experience in similar pipe system design and supply, capable of providing a comprehensive scope with a commitment to manufacturer the product locally in accordance with the latest international code ISO 14692.

Future Pipe Industries Qatar was QP's selected supplier for the entire scope of supply for the GRP, GRE and GRV piping for this major and one of a kind project.