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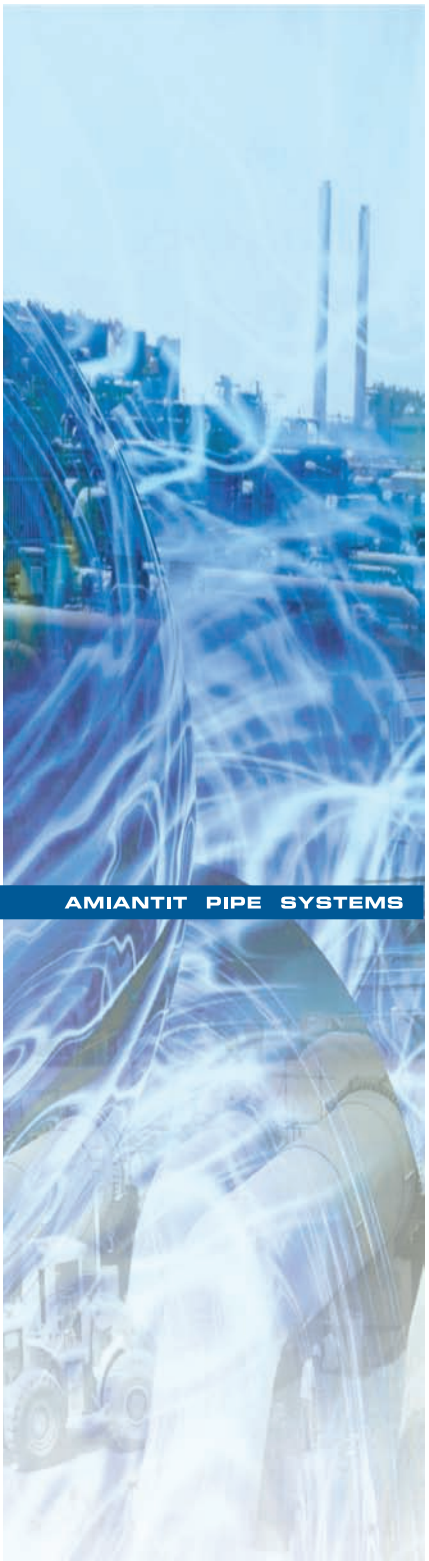
FLOWTITE

Case History - Shoiaba Power and Desalination Plant Phase 3

Shoiaba, Kingdom of Saudi Arabia



Introduction

Since it relies heavily on desalinated water for its fresh water, the Kingdom of Saudi Arabia is considered to be the world's largest producer of desalinated water. The Kingdom established so far 30 desalination plants on the Red Sea and Arabian Gulf coasts, which produce 3.6 million m^3 of water per day.
This production satisfies approximately 60% of the countries demand for drinking water.

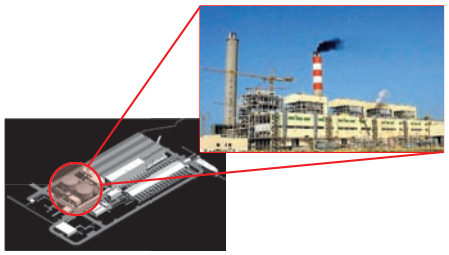
Demand for water in Saudi Arabia is chronic and is on the rise, thus, it is projected to increase from 6 million m^2/day in 2004 up to 9.6 million m^3 /day by 2020. In response to the increase, the Government has set-up various desalination plants at both, the Red Sea and the Arabian Gulf coastal lines.

The Shoiaba desalination and power plant is measured as the world largest water and power plant. It provides water requirements for the cities of Jeddah, Makkah, Taif and Al-Baha with a total population of over 7 million residence. Once completed by the end of 2008, it will generate approximately 9000 MW of electricity and desalinize 880000 m^3 of fresh water per day.

Project Overview

In 2005, the Shoaiba Water and Electricity Company (SWEC) headquartered in Riyadh, Saudi Arabia awarded a USD $2.13 billion contract to an international consortium led by the German engineering group Siemens to construct Shoaiba desalination and electric plant Phase 3. The Independent Water and Power Project (IWPP) consists of a desalination plant which is an oil-fired CCGT power and desalination complex in Saudi Arabia on the coast of the Red Sea - about 120 km (75 mi) South of Jeddah.

M/S Doosan heavy industries from South Korea was selected by the consortium as the main contractor to build the Shoiaba desalination plant. Amiantit Fiberglass Ind. Ltd. (AFIL) was awarded the contract by M/S Doosan to design, manufacture and supply a complete piping system for the project.



Amiantit Fiberglass® Industries Ltd (AFIL) commissioned in 1977 as a Flowtite® GRP pipes systems and fittings manufacturer at the industrial area in Dammam, Saudi Arabia. Since then AFIL has produced more than 10 million meters (328 million feet) of its Flowtite® continuous advancing mandrel processed Glass-fibre Reinforced Plastic (GRP) pipes, which represents the state of the art in GRP pipe production technology.

AFIL has supplied and supported its products nationally and internationally; it has delivered to countries at the Mediterranean Sea like Egypt, Syria and Libya and to countries at the Pacific Ocean like Hong Kong, New Zealand and Australia. Destinations in Malaysia, Singapore, India, Iran, Pakistan and Turkmenistan have also received GRP pipes from AFIL.

The manufactured Flowtite® GRP pipes from AFIL have come a long way from conventional pipes in terms of durability, reliability and ease of maintenance and installation. But that's only a fraction of the selection attributes when choosing a product for such big infrastructural projects. A lot of the decision is also based on the made-positive experience on manufacturing capabilities, "After-Sales" services and delivery times. Due to the outstanding performance that AFIL made with M/S Doosan in that respect, they decided to chose AFIL as their supplier of choice.

Product Range

In 2005, AFIL has signed a contract with M/S Doosan Heavy Ind. Ltd. of South Korea to design, manufacture and supply Flowtite® GRP pipes and fittings for Shoiaba IWPP Ph-3 project. The Shoiaba project consists of 10 seawater supply lines of DN 1900 mm and 2700 mm pipes with a stiffness class of 2500 N/m^2 and a pressure class of 6 bar and other several lines of diameters ranging from DN 1800 to 3900 mm with the same stiffness and pressure class for seawater discharge lines.
The aboveground portion contains several lines of pipes ranging from DN 50 mm to 2200 mm with a stiffness of 5000 and 10000 N/m^2 and with pressure of 3 to 7 bar.

Field Installation and Hydrotesting

The installation methods used in this project were underground and aboveground installation.

Underground installation (UG): is a common installation method for AFIL's Flowtite® GRP pipes. For this project the GRP pipes were installed in a normal trench. The single pipes were joined by butt and wrap lamination, thus creating a restrained joint system.
In some locations, AFIL has also used the standard couplings Flowtite's® non-restrained joint system.

Aboveground installation (AG): refers to the installation of pipes on the aboveground level where the pipeline is fully exposed and supported on cradles. This method is often used inside plants and requires a detailed stress analysis to ensure proper performance.
The support was both concrete and GRP installation. For this installation, the joints where installed with rigid butt straps (B/S) or Butt-and-Wrap joints and flanged joints. However, Flowtite® flexible coupling joints might also be used in AG piping using different supporting systems.

Apart from supervising the installation, AFIL was fully involved in the technical support requirements to accomplish the task of hydrotesting. The whole piping system was successfully hydrotested and passed all required testing at the following test pressures:

- Seawater Supply Lines : up to 9.0 bar
- Seawater Discharge Lines : up to 4.5 bar
- Aboveground Lines : up to 9.7 bar

Project Data Sheet

General	**Project**	Shoiaba Desalination Plant Phase 3	
	Client	Shoiaba Water and Electrical Company (SWEC)	
	Contractor	Doosan Heavy Ind. Ltd.	
	Location	Shoiaba, Saudi Arabia	
Product specification and information	**Installation type**	**Aboveground**	**Underground**
	Application	Potable water	Seawater Supply Line Seawater Distillate Line
	Diameter (DN),mm	50 to 2200	1900 & 2700 1800 to 3900
	Pressure (PN), bar	3-7	6
	Stiffness (SN), N/m²	5000 to 10000	2500
	Design Temperature °C	65	65
	Jointing System	Butt and Wrap (B/S) Joint (Lamination joint)	B/S and coupling combined system
	Total length (m)	345	2084

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