Offshore water treatment

VWS WESTGARTH

FPSO Vitoriá (138,400 BWPD)

Process:	**Sulphate Removal**
Client:	**Saipem S.p.A.**
Country:	**Italy, Brasil**.
Contract Description:	**Supply of Water Injection plant for sulphate removal and Chemical Dosing and Utilities plant modules**
Contract Date:	**July 2005**
Contract Completion Date:	**July 2006**
Capacity:	**138,400 BPD (22,000 m^3/day)**
Sea Water Conversion:	**75%**
Sea Water Feed Quality:	**36,000 mg/l (tds)**
Product Water Output Quality:	**≤ 100 mg/l sulphate**

Project Description:
The Project is for the design, supply of a seawater treatment plant sized for 138,400 BPD (22,000 m^3/day) of low sulphate water for the FPSO Vitoria (Golfinho 2), which will operate in the Golfinho Field, offshore Brazil.

The Project scope consists of:-

A) Water Injection Plant in a single lift module arrangement comprising: Multi-media Fine Filtration, Guard Cartridge Filters, HP Feed Pumps, Sulphate Removal Membrane System, Vacuum Deaerator, Water Injection Pumps, Chemical Cleaning System, Chemical Dosing Systems, Control Valves and Instrumentation, Fire & Gas Detection Systems, Deluge System, Lifting Equipment and Module Lighting.

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B) Chemical Dosing and Utilities Plant in a single lift module arrangement comprising: Automatic Backwashable Coarse Strainers (including SRP Plant feed), Cooling Medium Treatment System comprising Heat Exchangers, Expansion Vessel, Filters and Circulating Pumps and Process Chemical Dosing Systems, complete with pump sets and storage vessels and tanks, and comprising Polyelectrolyte Dosing, Oil Defoamer Dosing, Scale Inhibitor Dosing, Wax Inhibitor Dosing, Demulsifier Dosing, Gas Corrosion Inhibitor Dosing and Gas Hydrate Inhibitor Dosing, Instrument Air Receiver, Nitrogen Gas Generator Package, Nitrogen Gas Receiver, Sodium Hypochlorite Generator Package, Instrumentation, Fire & Gas Detection Systems, Deluge System, Lifting Equipment and Module Lighting. Process Description:

Fine filtration is achieved by a set of variable velocity, multi-media fine filters to provide fine filtration down to 5µm prior to membrane trains. The set of fine filters supplies feed water for two (2) trains.

The conditioned water, boosted to the required feed pressure, enters the Sulphate removal trains. Each membrane train is fitted with pressure vessels containing SR90-400 nanofiltration elements. A recovery of 75% is achieved by a 2:1 brine staged configuration. Brine reject from the process is discharged overboard, while the low Sulphate permeate is routed to a vacuum deaerator and onward to water injection pumps for injection to the wells at the required pressure. A dedicated clean in place (CIP) package, consisting of cleaning tank, pump, heater and cartridge filter vessel is provided for membrane cleaning purposes.

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