

## Project Case Study

### Reverse Osmosis Desalination Plant for Offshore Potable Water Production

<b>Client:</b>	Talisman Energy UK Ltd
<b>End User:</b>	Talisman Energy UK Ltd (Clyde Platform)
<b>Capacity:</b>	30 m <sup>3</sup> /d
<b>Contract Value:</b>	circa £95K
<b>Scope:</b>	Design, build & commission
<b>Contract Completion:</b>	April 2003 to September 2003



#### General

Example of a package RO desalination plant capable of producing 30 m<sup>3</sup>/d of potable water from North Sea seawater.

This particular plant was ordered to replace an existing potable water maker that had reached the end of its working life and had become very expensive to maintain.

#### Project Details

The package comprises of two separate skid assemblies, a pre-treatment skid and the RO skid.

Feed water is taken from the platforms chlorinated seawater ring main and is fed to the pre-treatment skid.

The pre-treatment skid includes sand filtration (for suspended solids reduction) and carbon filtration (for chlorine removal). The filters are automatically backwashed with sequencing controlled via a PLC.

The filter vessels are carbon steel, coated internally and externally with ScotchKote 206N Fusion Bonded Epoxy.





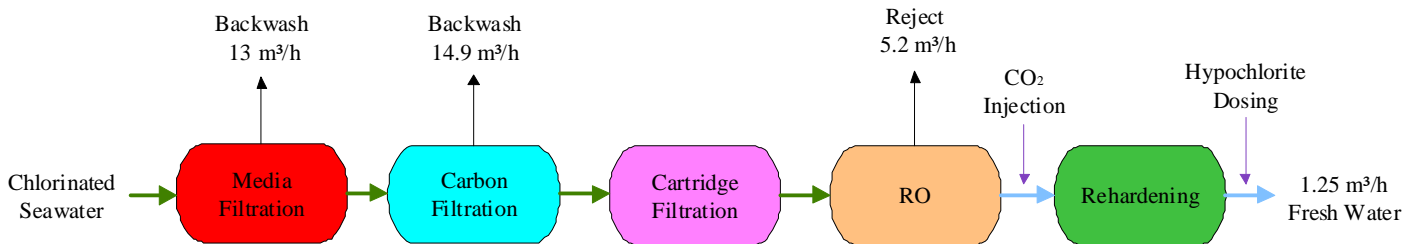
The RO skid includes cartridge filtration (down to 5µm), a high pressure pump (to increase the feed water pressure to the RO membrane elements to between 50 and 68 barg), RO membrane stack, and post-treatment (remineralisation c/w CO<sub>2</sub> injection to increase the hardness of the RO permeate and also hypochlorite dosing to disinfect the product water).

This skid also includes RO membrane cleaning equipment (tank, immersion heater, pump, etc...) and all the necessary controls and instrumentation.

Low pressure pipework is ABS Class E and high pressure pipework is Duplex Stainless Steel.

The package was inspected by Lloyd's Register of Shipping with the client witnessing factory acceptance tests.

**Process Flow**



**Performance Characteristics**

PARAMETER	DESIGN	ACTUAL
Feed TDS	35,011 mg/l	37,051 mg/l
Feed Temperature	3 to 17°C	7.8°C
Feed Flow	6.5 m³/h	6.6 m³/h
Permeate TDS	139 to 235 mg/l	85 mg/l
Permeate Flow	1.25 m³/h	1.25 m³/h
Permeate Hardness	<10 mg/l as CaCO <sub>3</sub>	7 mg/l as CaCO <sub>3</sub>
Potable Water Hardness	40 to 80 mg/l as CaCO <sub>3</sub>	45 mg/l as CaCO <sub>3</sub>
Potable Water Chlorination	0.5 to 1 mg/l	0.5 mg/l
Potable Water pH	6.5 to 8.5	7.7