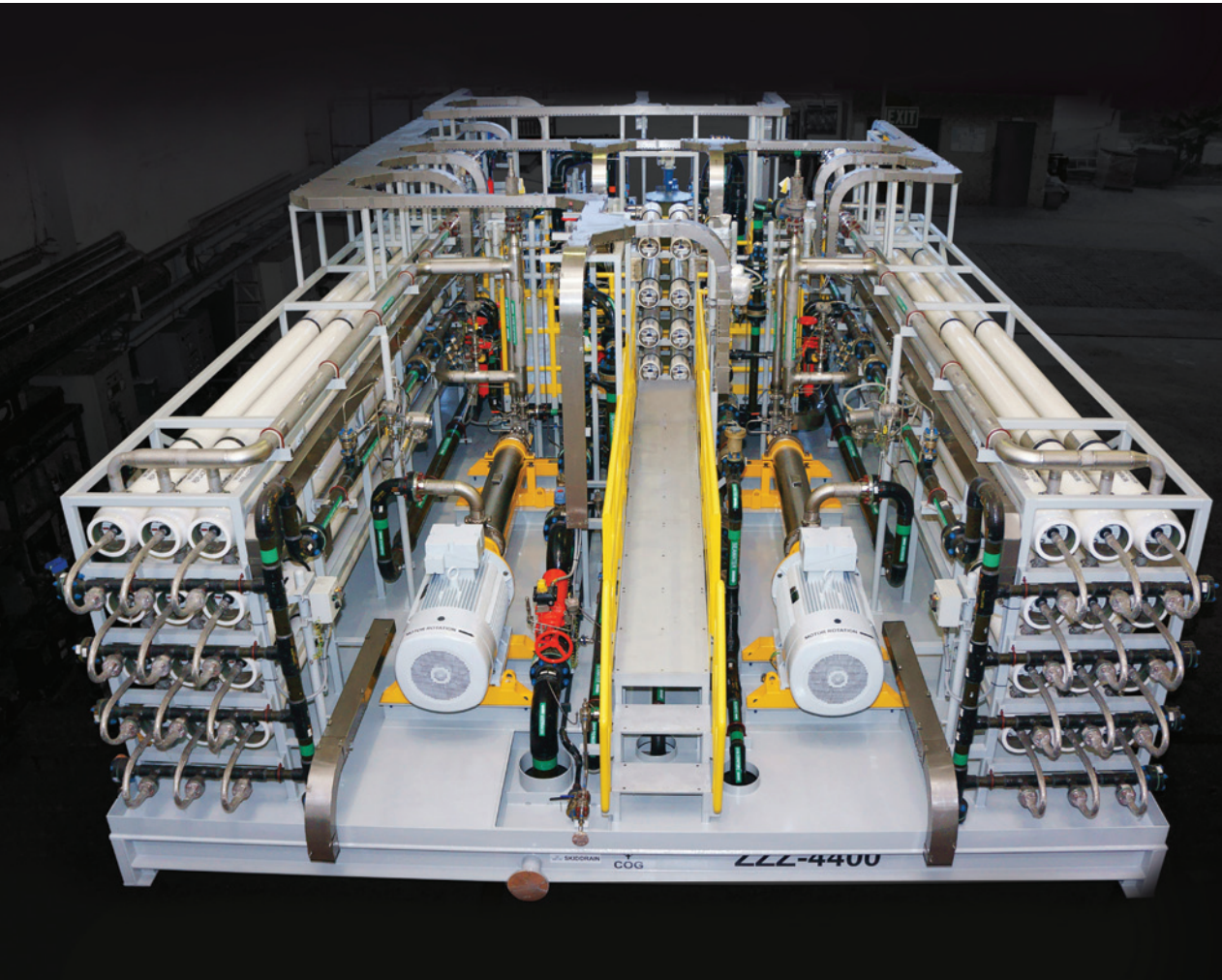


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## REVERSE OSMOSIS DESALINATION SYSTEMS FOR FPSO





## LEADING THE WAY IN WATER TREATMENT SYSTEMS

Incorporated in 1978 and based in Singapore, Hitachi Aqua-Tech Engineering Pte. Ltd. stands out in the water treatment industry by offering full EPC capabilities across a wide range of projects. With a strong focus on reverse osmosis (RO) and demineralisation systems, we are a complete system builder equipped with comprehensive engineering capabilities and in-house manufacturing facilities.

We are able to design, build and maintain a full range of water treatment equipment and plants that are customised for:

- Desalination
- Sulphate Removal
- Purification
- Ultra-purification
- Wastewater treatment

We are also fully capable to design, install and service RO systems for Floating Production, Storage and Offloading (FPSO) units to produce:

- Potable water
- General service fresh water
- Heating/Cooling water
- Oil Dilution water

Backed by strong insight into the FPSO market, we offer a high degree of customisation to ensure delivery of best-fit solutions for individual FPSO units and other offshore platforms.



## TAKING ENGINEERING TO THE NEXT LEVEL

Engineering expertise honed over more than 30 years is the reason why we are able to design and build efficient and robust RO systems that are also cost-effective. Our systems are built to stand up to challenging marine environments, making them ideal for service on FPSO units.

Across the entire engineering process, Hitachi Aqua-Tech utilises the very latest in technology and methodology to provide the best possible outcomes:

- Economically positioned high energy recovery RO systems design (PX design)
- 3D modelling with AutoCAD-Inventor-Pro
- PDMS model format
- Static and dynamic analysis and simulations/ calculations of structures and skids with STAAD PRO software on sea motion considerations
- Detailed material take off
- Animation preview on material handling
- Detailed clash analysis
- Detailed 3D model human walk-through for maintenance & operations
- ISA P&ID standards
- Brazilian Regulation NR-10, NR-13, NR-26 and Portuguese documentation
- ABS certification documentations

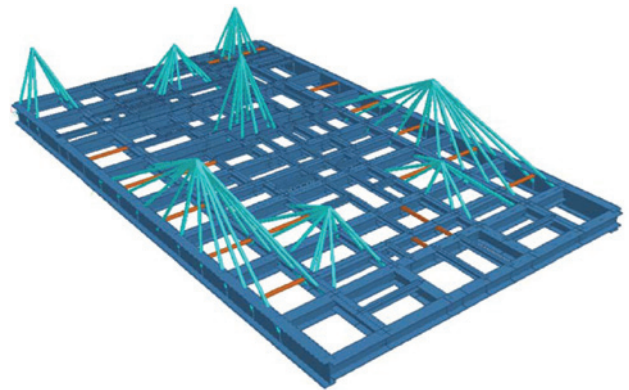


Figure 1. STAAD Pro Computer Model of RO Skid

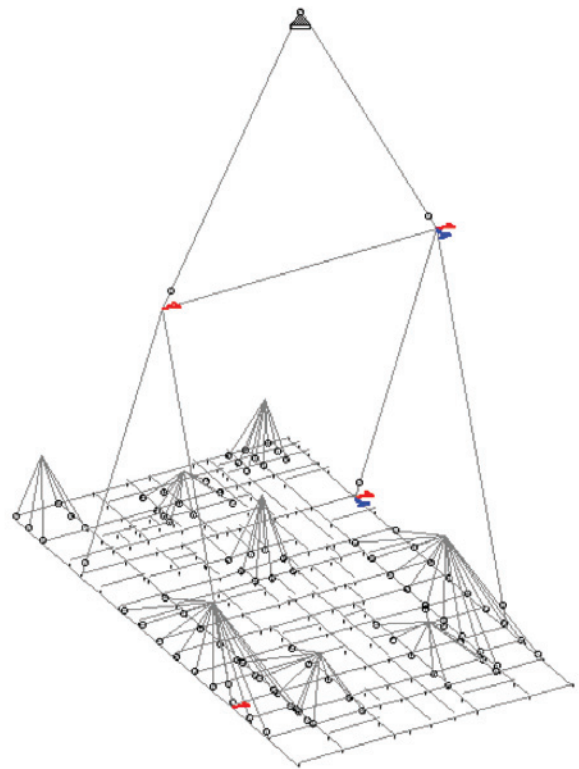


Figure 2. Boundary Condition for Lifting Analysis

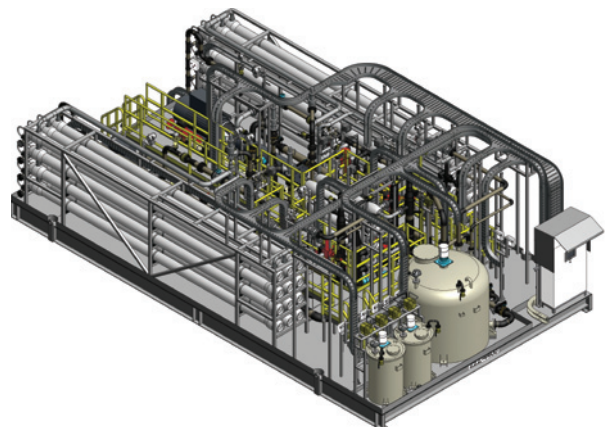


Figure 3. PDMS 3D Modelling



## PROCURING TO YOUR BEST ADVANTAGE

Hitachi Aqua-Tech follows stringent policies and procedures when it comes to procurement of materials and equipment. We deal directly and only with equipment vendors and materials stockists, enabling us to secure the best prices which are passed on to you. Practising accurate materials forecast and bulk ordering, we further ensure that we buy-in at the most competitive prices in the market.

Our carefully managed vendor list only includes approved vendors who can pass our stringent QA/QC procedures, ensuring that only the very best parts and materials go into your project. Good quality and low costs from the very beginning of the manufacturing cycle is one big reason we always deliver our projects with the highest quality, at the optimum costing.

## QUALITY BEYOND THE ORDINARY



Three decades in the pursuit of excellence has enabled us to display the highest degree of quality in every detail and at every stage of our production cycle. Behind our success is a combination of tested procedures, impeccable workmanship and highly qualified people, which enables our work to meet the international standards.

- Stringent ISO 9001 QA/QC procedures
- Certified welders for EN3.1, A36, and SDSS-UNS-32760/32750
- Certified bonders for FRP-Ameron-5000/6000/7000M
- Qualified PLC and HMI/SCADA programmer
- Certified electrical control panel for hazardous locations
- Full process control sequence simulation
- ABS certified products
- Project Quality Plan - enable project management for timely delivery of systems to client

### Hitachi Aqua-Tech Engineering Pte.Ltd.

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Catalogue No.: HAQT-FPSO1-2013



CERT No.: 2006-1-0801  
 ISO 9001:2008



# REVERSE OSMOSIS DESALINATION SYSTEMS FOR FPSO

## OSX3

Project Name  
FPSO OSX3

### System Data

Capacity: 1113 m<sup>3</sup>/D x 2 units  
Size: 6.5mW X 11.5mL x 3.8mHt  
Weight: 49 Tons (Gross Operating)  
Location: Topside

Year Complete  
2012

Year Commissioning  
2013

### Description

Freshwater Maker for Oil Dilution

### End Client

OSX Uma Empresa do Grupo EBX

### Customer

MODEC Singapore



## MV24

Project Name

FPSO Cidade de Mangaratiba

### System Data

Capacity: 750 m<sup>3</sup>/D x 2 units  
Size: (i) PV Skid: 2.5mW x 7mL x 3.4mHt  
(ii) Pump Skid: 4.2mW x 6mL x 2.8mHt  
Weight: 46 Tons (Gross Operating)  
Location: Engine Room

Year Complete  
2012

Year Commissioning  
2014

### Description

Freshwater Maker for Oil Dilution

### End Client

Petrobras

### Customer

MODEC Singapore



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# REVERSE OSMOSIS DESALINATION SYSTEMS FOR FPSO

**HITACHI**  
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## MV26

Project Name  
FPSO Cidade de Itaguaí

### System Data

Capacity: 750 m<sup>3</sup>/D x 2 units

Size: (i) PV Skid: 2.5mW x 7mL x 3.4mHt  
(ii) Pump Skid: 4.2mW x 6mL x 2.8mHt

Weight: 46 Tons (Gross Operating)

Location: Engine Room

Year Complete  
2013

Year Commissioning  
By 2015 (Estimated)

Description  
Freshwater Maker for Oil Dilution

End Client  
Petrobras

Customer  
MODEC Singapore



## P9

Project Name  
FPSO Cidade de Caraguatatuba

### System Data

Capacity: 750 m<sup>3</sup>/D x 2 units

Size: (i) BoosterSkid: 4.4mW x 5mL x 2.1mHt  
(ii) Pump Skid: 4.2mW x 6mL x 2.7mHt  
(iii) PV Skid: 2.5mW x 7mL x 3.8mHt

Weight: 54 Tons (Gross Operating)

Location: Engine Room

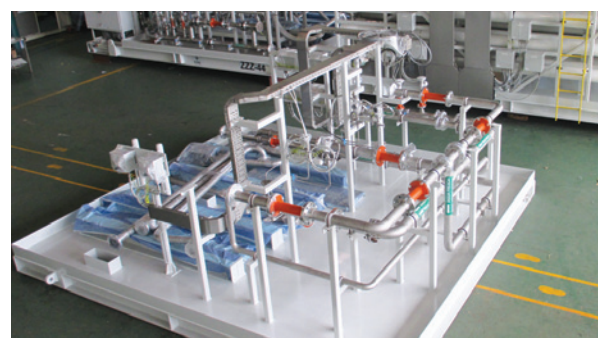
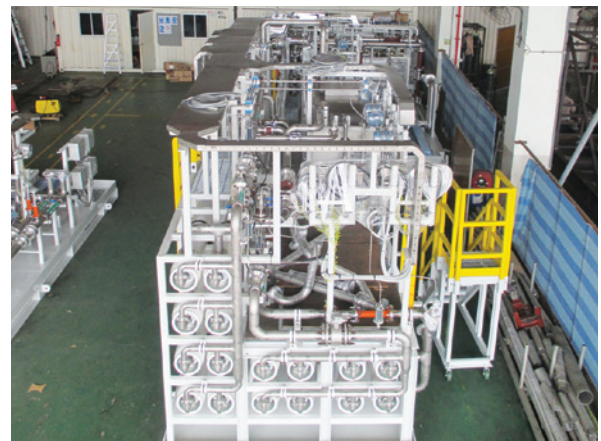
Year Complete  
2014

Year Commissioning  
By 2016 (Estimated)

Description  
RO Package

End Client  
Petrobras

Customer  
MODEC Singapore



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# REVERSE OSMOSIS DESALINATION SYSTEMS FOR FPSO

## P74

Project Name  
FPSO P74

System Data  
Capacity: 600 m<sup>3</sup>/D x 2 units  
Size: 5mW x 13mL x 3.8mHt  
Weight: 44 Tons (Gross Operating)  
Location: Topside

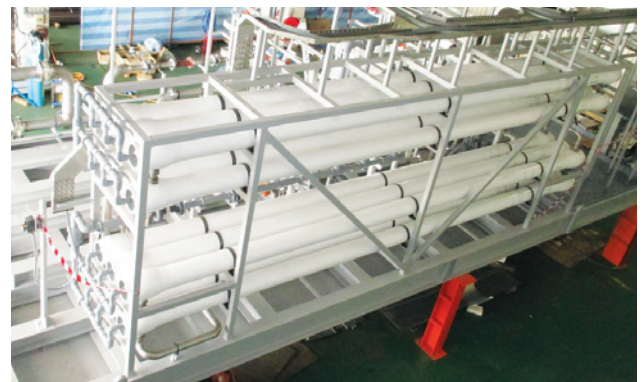
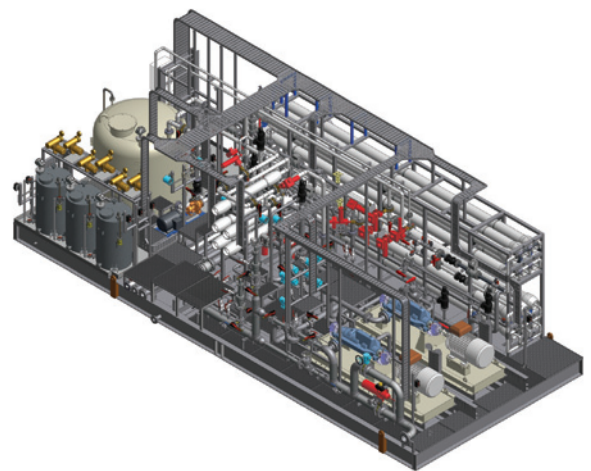
Year Complete  
2014

Year Commissioning  
By 2015 (Estimated)

Description  
Fresh Water Maker for Oil Dilution

End Client  
Petrobras

Customer  
Estaleiros do Brasil /  
Toyo Engineering Construction

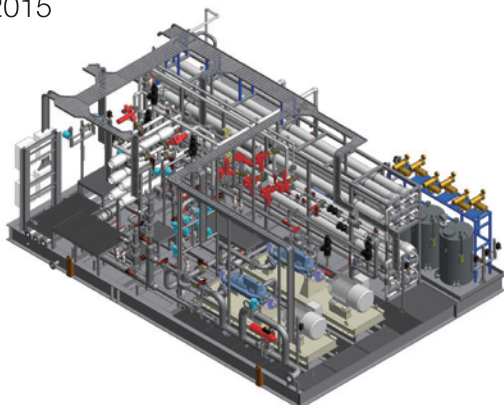


## P75

Project Name  
FPSO P75

System Data  
Capacity: 600 m<sup>3</sup>/D x 2 units  
Size: 6.5mW x 9.3mL x 3.71mHt  
Weight: 44 Tons (Gross Operating)  
Location: Topside

Year Complete  
By 2015

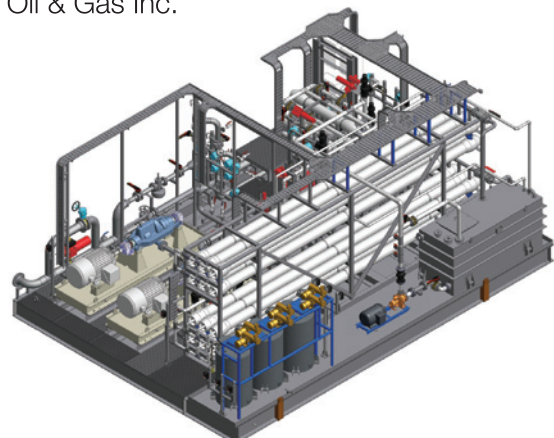


Year Commissioning  
By 2016 (Estimated)

Description  
Fresh Water Maker for Oil Dilution

End Client  
Petrobras

Customer  
QGI Oil & Gas Inc.



# REVERSE OSMOSIS DESALINATION SYSTEMS FOR FPSO

**HITACHI**  
Inspire the Next

## P76

Project Name  
FPSO P76

System Data  
Capacity: 600 m<sup>3</sup>/D x 2 units  
Size: 5mW x 12.5mL x 3mHt  
Weight: 49 Tons (Gross Operating)  
Location: Topside

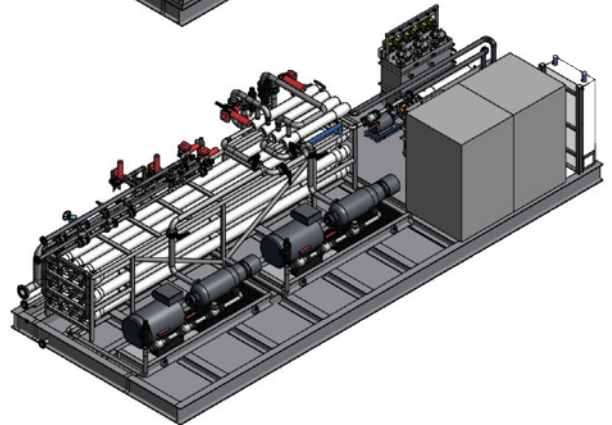
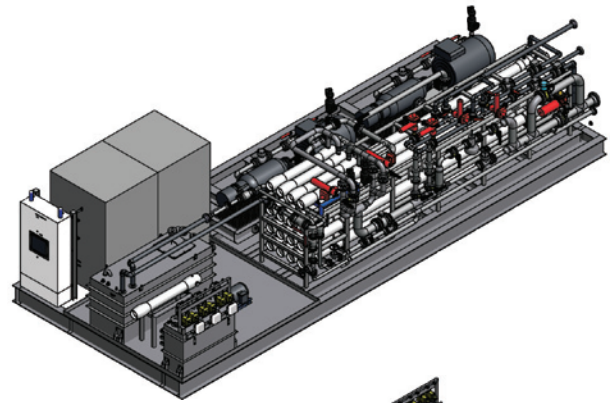
Year Complete  
By 2015

Year Commissioning  
By 2016 (Estimated)

Description  
Freshwater Maker for Oil Dilution

End Client  
Petrobras

Customer  
Consorcio Technip - Techint



## P77

Project Name  
FPSO P77

System Data  
Capacity: 600 m<sup>3</sup>/D x 2 units  
Size: 6.5mW x 9.3mL x 3.71mHt  
Weight: 44 Tons (Gross Operating)  
Location: Topside

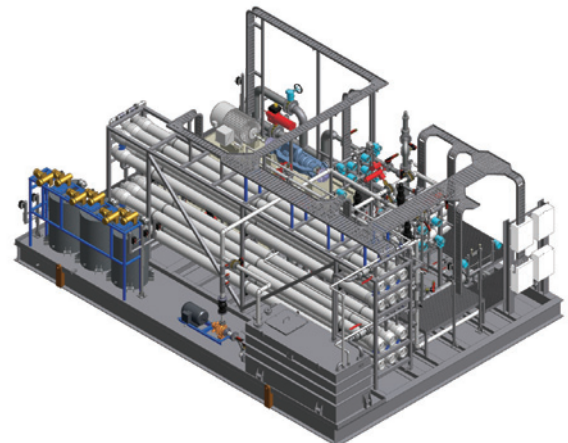
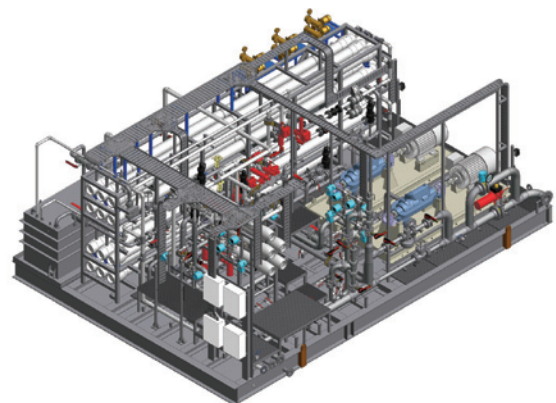
Year Complete  
By 2015

Year Commissioning  
By 2016 (Estimated)

Description  
Freshwater Maker for Oil Dilution

End Client  
Petrobras

Customer  
QGI Oil & Gas Inc.



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