



**OFFSHORE CONSTRUCTION SPECIALISTS**

**PRE-QUALIFICATION DOCUMENT FOR DESIGN,  
PROCUREMENT, FABRICATION OF SUBSEA  
SAMPLING UNIT**



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41578/A/0001/UK/En

# **PRE-QUALIFICATION DOCUMENT FOR FABRICATION**

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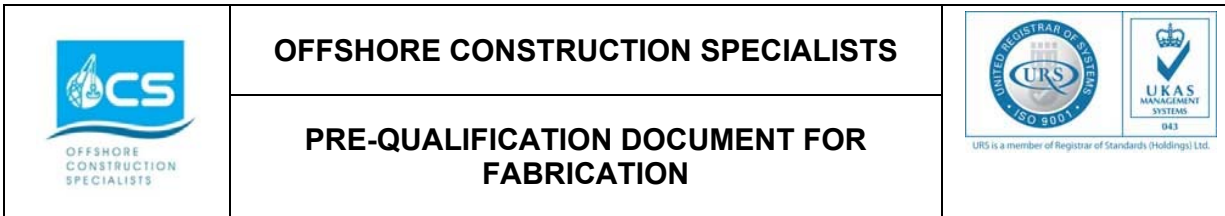
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### **Company Position**

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	<b>OFFSHORE CONSTRUCTION SPECIALISTS</b>	
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## 1 INTRODUCTION

Offshore Construction Specialists (OCS) was formed in 2007 from a core group of marine construction engineers to provide construction management, engineering and strategic support equipment services primarily to the offshore oil and gas sector.

Our key personnel come from previous careers at J.Ray McDermott in the marine operations department. Our managing and technical director Mr Keith Jackson worked for 17 years in the group the last 5 years as the marine division manager.

As a matter of policy under Mr Jackson J.Ray McDermott would execute work peripheral to that being undertaken by the major work vessel (normally executed using third party subcontractors) using in-house resources. Pipeline pre-commissioning, pre and post trenching, flexible flowline / umbilical lay are examples of work that was routinely carried out in-house and not subcontracted. One of the main reasons for doing this was that it prevented the activities of the subcontractor impinging on the work of the high cost marine spread. The work was always planned with maximum operational synergy in mind

In JRM large pipeline pre-commissioning projects such as the 650 km West Natuna gas gathering pipeline network and many other major projects were planned and executed in-house.

OCS has taken the model developed in JRM and applied it to our own activities. Our equipment is managed and operated by people who come from the same background as the main marine contractor. We help the marine contractor plan the work such that the pre-commissioning has the least impact on operations. We are proactive in highlighting potential issues and ensuring both parties win. Our engineering capabilities are very sophisticated and significantly more advanced than our competitors.



OCS has now completed a range of pre-commissioning projects for many different customers with great success. OCS is certified by Nata for pipeline hydro testing which is the preeminent qualification for pre-commissioning contractors. The OCS organisation has also been qualified to ISO 9001 since 2009.

OCS is equipped to handle large projects or discrete project elements depending on the specific needs of the customer.

The company has grown steadily since incorporation and now employs 60 personnel of whom 30 are civil / structural and mechanical engineers working with our pre-commissioning technicians.

The company office in 36 Kian Teck Road, Singapore has room for additional expansion. The office can accommodate customer representatives for liaison as necessary.

OCS is a one stop solution provider to facilitate with full range of product solution, from design to final fabricated product; and works closely with classes like DNV, ABS etc. We have established long term relationships with key Singapore and overseas vendors. In the recent past, OCS has added fabrication of skids and offshore units into its speciality wing. To highlight, few of past fabrication scopes are explained in detail as a part of this document.

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## 2 OCS ORGANISATION CHART

### KEY PERSONNEL CONTACTS

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# OCS ORGANISATION CHART



- LEGEND**
- Singapore Head Office
  - Australia Office
  - Middle East & North Africa Office
  - India Office
  - UK Office
  - USA Office

Updated on 28 Jan 2016

### 3 SUBSEA SAMPLING UNIT

Subsea sampling unit (SSU) is a subsea asset developed for Baker Hughes, Australia with immediate application in the Ichthys project (*Gas field is located in area WA-285-P, off the north-west coast of Western Australia and is approximately 820 kilometres south-west of Darwin.*)

SSU's primary function is to collect samples of water and MEG during pigging operation. The Subsea Sampling Unit (SSU) will be fastened to the subsea 42" PLR structure onshore and will be deployed together with the PLR from a heavy lift vessel to the subsea PLR installation point which is at a depth of approximately 250m.

SSU will be connected to subsea pig receiver via 2" flexible hose and hot stab receptacle.

An ROV will operate the valves for sample collection. Three samples of treated sea water (*flooded water*) will be taken during the dewatering run with the other seven samples (*4 potable water and quantity 3 MEG*) being taken as each pig and separation slug arrives at the PLR. After sample collection, the sample containers shall be isolated to prevent contamination. The volume of each separation slug and the speed of the pig train are expected to provide a minimum of 10 minutes for sampling valve operations between each slug.

The SSU and samples will be retrieved to the surface with the PLR and the sample containers will be disconnected from the unit and be sent for laboratory analysis.

In order that valves and manifolds do not obstruct with debris, 1" stainless steel tubing and isolation valves are were used. Local isolation valves (non ROV) were selected to allow the greatest flow path

Specific activities undertaken by OCS for the completion of SSU are listed below:

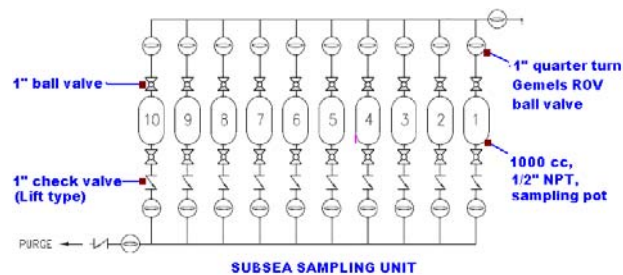
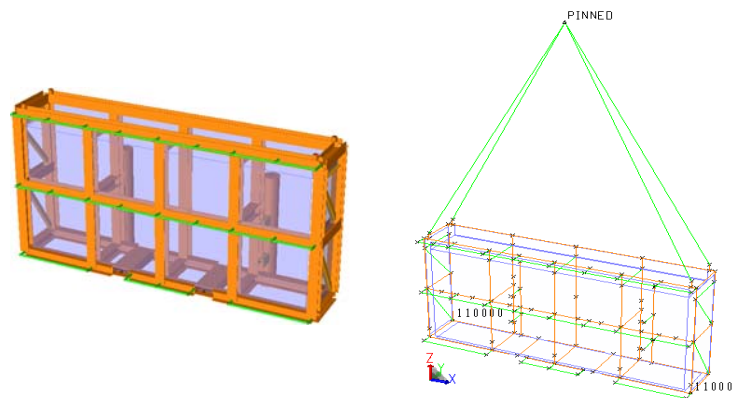
No.	OCS Responsibilities
1	Design and Engineering of SSU
2	DNV Certification of engineering
3	DNV Certification of fabrication
4	Procurement of ROV valves and sampling bottles, etc.
5	Fabrication
6	Load Test
7	Assembly and Function Test
8	Hydro test at 135 Bar
9	Nitrogen Packing



### 3.1 DESIGN AND ENGINEERING

OCS Engineering has extensive experience in all areas of analyses and design related to Marine pipelines, Structures and associated facilities. Specific highlights carried out for **Subsea Sampling Unit (SSU)** are listed below:

- SSU valves are designed to enable operation by a working class ROV 5 function Manipulator Arm.
- SSU is rated for operations at a maximum depth of 350 meters (hydro test requirement). Skid frame itself does not have any air pockets and are qualified for use at higher water depths.
- The SSU is capable of obtaining ten (10) individual samples without contamination
- SSU is designed to enable purging of the sampling cylinder between each sample so that contamination of samples is reduced.
- SSU Lifting frame is designed, fabricated and tested in accordance with DNV 2.7-3 including the required permanently attached lifting points.
- ROV operable valves and ROV grab handles on the SSU are designed as per ISO 16328-8



### 3.2 PROCUREMENT

Item Description	Specification
ROV Valve	1" Gemels Ball valve, 400 Bar rated
Sampling Bottle	DOT compliant, 340 Bar rated
Hose	Alfagomma R1AT, 88 Bar rated
Ball valves	DK-Lok/Hy-Lok, 340 Bar minimum
Check valve	DK-Lok, 200 Bar, crack pressure 0.07 Bar



Gemels 1" ROV Valve-SS316



Swagelok DOT complaint-1000 cc - Subsea Sampling Bottles



Alfagomma Hoses and Hot Stab



High Pressure Ball Valve



### 3.3 FABRICATION

OCS provides full range of capabilities to support fabrication/construction of small to medium sized offshore structures. SSU skid frame is fabricated in compliance with DNV 2.7-3 code. Materials used in the construction of SSU had impact requirements at -20 deg C.



Final product top view



Fabrication of SSU skid frame



Load test



DNV certificate for SSU frame



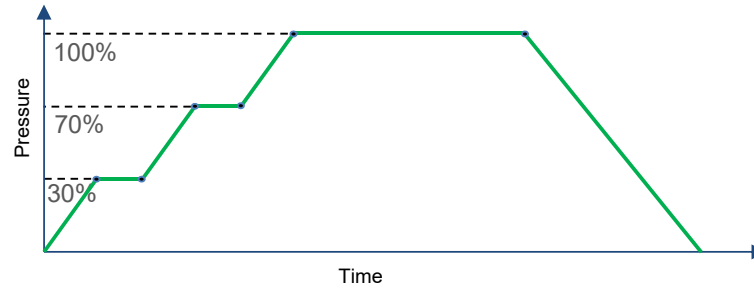
Final product ready for shipping



Final product ready for shipping

### 3.4 HYDROTESTING

With Clean potable water as test medium, hydraulic circuit of SSU was pressurized to 135 bar of to check for possible leakages.



High Pressure PH Pump



Hydrotest manifold



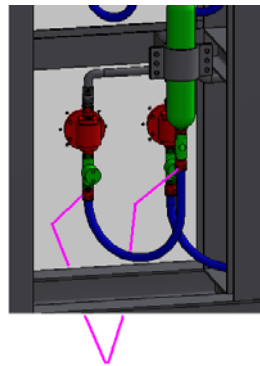
Pressure reading



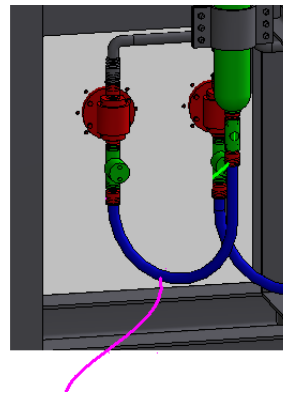
Sampling bottle, ROV valve, check valve  
and ball valve

### 3.5 FUNCTION TEST

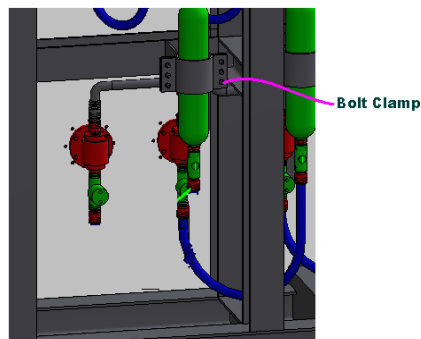
- ✓ Flow tests were carried out to ensure free flow of test medium through all possible openings of hydraulic circuit.
- ✓ Torque requirements of the ROV valves are checked by pressurizing at the inlet side only.
- ✓ On completion of testing, bottom U-tubes were removed and drained
- ✓ After bottom U-tubes are reinstated, the entire hydraulic circuit was purged with nitrogen.



Step-1: Unthread tube fittings



Step-2: Remove tubing

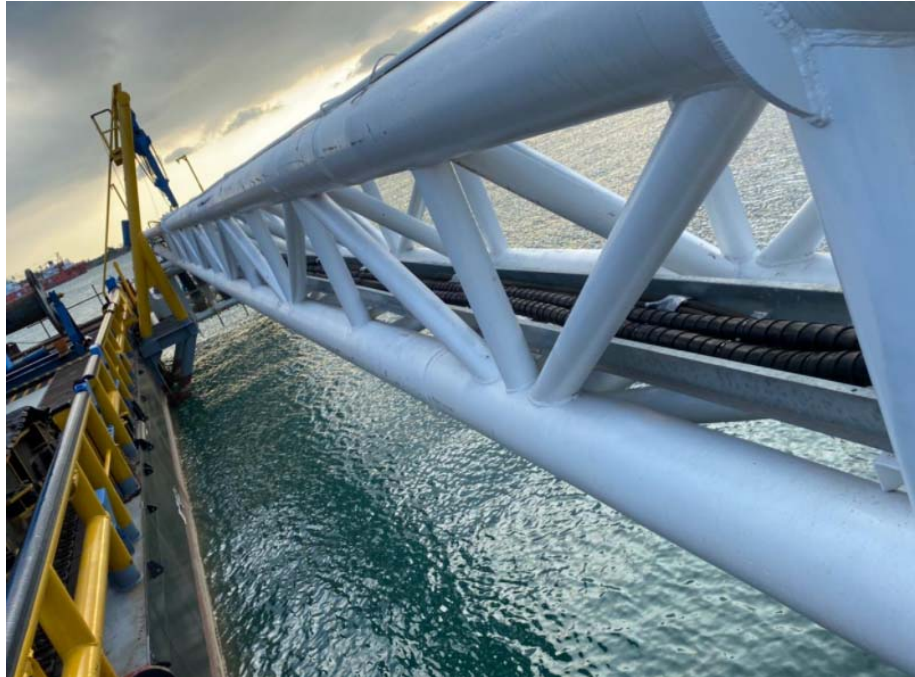


Step-3: Hold sampling bottle with hand and unbolt holding clamps



#### 4 DREDGING ARM

A state of arm-subsea dredging system, which mounts 2 nos of sand pump at the tip for dredging operation.





## 5 CONTROL SYSTEM





## 6 CHEMICAL INJECTION SYSTEM



## 7 FUEL GAS SKID



## 8 JETSLED FOR POST-TRENCHING THE PIPELINE





## 9 60MT A-FRAME





## 10 CHEMICAL CLEANING SPREAD



## 11 ISO CERTIFICATION



# Certificate of Registration

This certificate has been awarded to

**Offshore Construction Specialists Pte Ltd**

36 Kian Teck Road, Singapore 628781, Singapore

in recognition of the organization's Quality Management System which complies with

**ISO 9001:2008**

The scope of activities covered by this certificate is defined below

**Provision of Project Management and Consultancy Services for Oil and Gas Construction Facilities**

<b>Certificate Number:</b>	<b>Date of Issue: (Original)</b>	<b>Date of Issue:</b>
41578/A/0001/UK/En	19 November 2010	15 September 2015
<b>Issue No:</b>	<b>Expiry Date:</b>	
3	18 November 2016	

Issued by: 

On behalf of the Schemes Manager



If there is any doubt as to the authenticity of this certificate, please do not hesitate to contact the Head Office of the Group on info@urs-certification.com. URS is a member of United Registrar of Systems (Holdings) Ltd, Delta Manor, Delta Road, Broomfield, B11 3AS, UK. Company Registration no. 8280489

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