

Contract No. 4501784359
Åsgard Gas Transfer Project
Riser Base
Tag. No. 18UD891

StatoilHydro

Note: Items marked in yellow are on HOLD until documentation has been delivered from StatoilHydro and Jotne E&P sub-suppliers for the various equipment either on, or to be used, on the Riser Base

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ROV INTERVENTION TASK LIST

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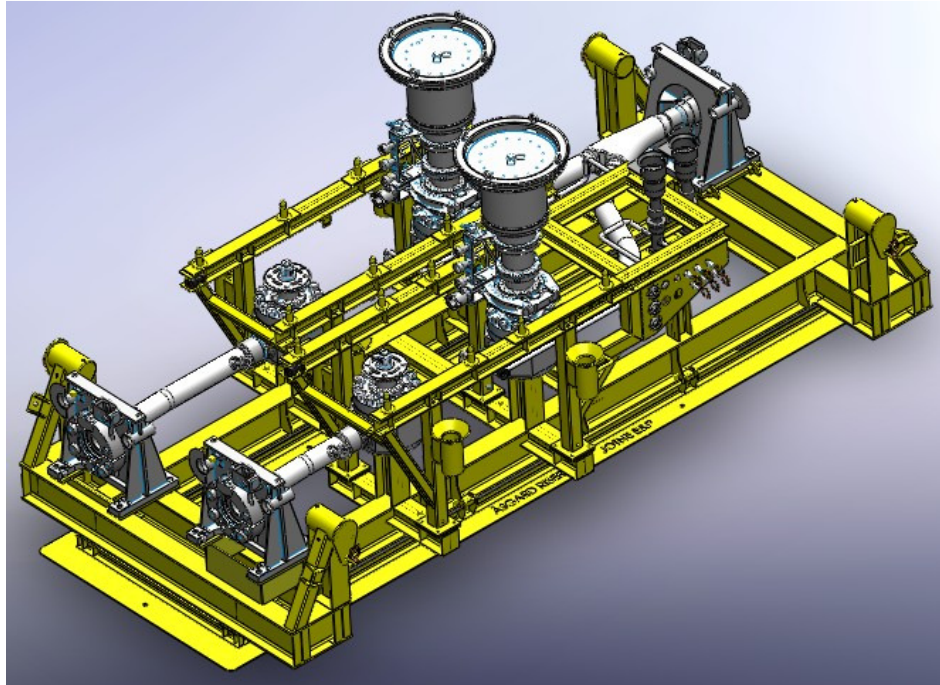


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INTRODUCTION

1.1 Purpose

The purpose of this document is as follows:

1. To identify all ROV Intervention tasks associated with installation, operation and recovery of Jotne E&P and CPI supplied equipment to be used on the Åsgard Riser Base project.
2. To describe the outline procedures associated with particular intervention tasks.
3. To make reference, where applicable, to dedicated Running and Retrieval (R&R) Procedures or User Manuals produced for the range of Jotne E&P supplied equipment which will provide the detailed operational procedures for the equipment and for the required ROV operations.
4. To identify the intervention tooling required to perform the task.
5. To describe the task interface with the ROV including ROV access, ROV stabilisation and interface cleaning requirements.
6. To provide the field ROV and Installation Contractors with input (related to Jotne E&P scope of supply equipment) to allow development of the complete field installation and IMR task list and procedures.

1.2 Document Contents and Usage

This document contains the intervention tasks grouped under generic sections relating to the type of task involved, e.g. Actuator Installation/Retrieval. Each of these tasks typically describes a number of intervention activities which could be expected to be performed in isolation or as part of a more complex task.

In describing a general task, a list of outline procedures is presented, in sequences, which define the steps required to complete that task. Listed together with the procedural steps are, where appropriate, references to Jotne E&P User Manuals, Running and Retrieval Procedures and other reference documents. Where a ROV task is fully described in alternative documents, only the reference is included in this document.

Contained within Section 3 is a High Level Task List defining all the major tasks contained within this document. Contained within Appendix A is the detailed ROV Interface Matrix summarising equipment required, access, cleaning required, etc.

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1.3 References

HOLD Waiting for document numbers from StatoilHydro and Jotne sub-suppliers. These hold points are relevant throughout the document task lists

2,7kNm Torque Tool Operation and Maintenance Manual

10" SB Cleaning Tool Operation and Maintenance Manual

10" Seal Replacement Tool Operation and Maintenance Manual

Vetco Gray Icarus Operation and Maintenance Manual

ART Operation and Maintenance Manual

Vetco Gray Inboard HUB Operation and Maintenance Manual

10" Top Entry Ball Valve Operation and Maintenance Manual

10" Valve Actuator Operation and Maintenance Manual

2 1/16" Gate Valve Operation and Maintenance Manual

1/2" Rotary Gate Valve Operation and Maintenance Manual

HFL Data Sheets

EFL Data Sheets

Subsea HPU Operation and Maintenance Manual

80kNm Torque Tool Operation and Maintenance Manual

HP Protection Cap Operation and Maintenance Manual

DnV; Parts 1 & 2
ISO 13628-8

Rules for Planning and Execution of Marine Operations
ROV Interfaces on Subsea Production Systems

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1.4 Abbreviations and definitions

5 F	5 Function Manipulator
7 F	7 Function Manipulator
ART	Actuator Replacement Tool
ATV	Advanced Technology Valve
BST	Back Seal Test
CW	Clockwise
CCW	Counter Clockwise
CP	Cathodic Protection
CPI	Company Provided Item
DNV	Det Norske Veritas
EFL	Electrical Flying Leads
FSC	Fail Safe Close
HFL	Hydraulic Flying Leads
HP	High Pressure
HSE	Health, Safety, Environment
IMR	Inspection Maintenance Repair
Jotne E&P	Jotne Engineering & Production
kNm	kilo Newton meter
LP	Low Pressure
OMM	Operation and Maintenance Manual
PTT	Pressure/Temperature Transducer
QA	Quality Assurance
QC	Quality Control
ROV	Remotely Operated Vehicle
R&R	Running and Retrieval
RT	Running Tool
SDU	Subsea Distribution Unit
SRT	Seal Replacement Tool
SSCT	Seal Surface Cleaning Tool
TT	Torque Tool
UTH	Umbilical Termination Head
WIA	Weight in Air
WISW	Weight in Sea Water
WLL	Working Load Limit
WROV	Work ROV

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ROV INTERFACE MATRIX

1.5 Introduction

The ROV interface matrix is presented in Attachment A. It lists each ROV interface point or task on the manifold and associated equipment. For each task, the following is described:-

- Description of the interface
- Type of interface with the ROV
- Open/close position of the interface
- ROV access
- ROV stabilisation
- ROV tooling required
- Torque values
- Interface cleaning requirements
- Interface protection requirements

1.6 ROV Access and Stabilisation

ROV access is described in terms of the approach to the interface and whether the interface access is open or restricted. At this interface location, the availability of a typical WORK ROV size for manoeuvring is stated (typical 2,8 m x 1,9 m x 2,4 m (LxWxH)).

Also described is the means of stabilising the ROV at the interface. Typically these are grab bars, platforms, docking systems or free flying requirements.

1.7 Open/Close Position and Tool Operating Torque

Where an interface requires an operation or movement to engage or retract, open or close, the required movement and direction of movement is described. The required tooling is described together with any torque or movement limitations.

1.8 Interface Cleaning and Protection Requirements

For each interface, a statement is provided of the acceptable means of cleaning marine fouling from the interface. The cleaning methods are normally low pressure (LP) or high pressure (HP) jetting performed by the ROV.

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HIGH LEVEL ROV TASK LIST

1.9 Introduction

This section contains the High Level Task List of ROV intervention tasks. Within the list each high level task is described and assigned a task number. The tasks are then described in detail in the following Task Description sheets. ROV access images are shown as stand-alone pictures in Attachment B.

1.10 High Level Task List

TASK NO.	HIGH LEVEL TASKS MATRIX DESCRIPTION	PAGE NO.
1.	RISER BASE INSTALL / RETRIEVE TASKS	
1.1	Install / Retrieve Riser Base	8
1.2	Retrieval / Installation of Lifting Slings	9
1.3	Reading of Roll / Pitch Indicator (bullseye)	10
2.	RISER BASE INTERVENTION TASKS	
2.1	10" Top Entry Ball Valve ROV Operated (18BL8912 and 18BL8914)	11
2.2	10" Actuated Top Entry Ball Valve (18EV8911 and 18EV0004)	13
2.3	2 1/16" Gate Valve ROV Operated (18GT8915A and 18GT8915B)	15
2.4	1/2" Rotary Gate Valve ROV Operated	16
3.	ACTUATOR OPERATIONS	
3.1	Retrieval/Installation of Valve Actuator using Vetco Grey ART tool	17
4.	TIE-IN TASKS	
4.1	Flowline Installation using Icarus	19
5.	OTHER / COMMON TASKS	
5.1	HUB Seal change out	20
5.2	Seal Surface cleaning	21
5.3	Hydraulic Flying Leads - Retrieve/Install	22
5.4	Electrical Flying Leads - Install / Retrieve	23

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Tasks 1. – RISER BASE INSTALL / RETRIEVE TASKS

ROV TASK DESCRIPTION AND REFERENCE DOCUMENTATION	
Task No: 1.1	Task: Install / Retrieve Riser Base
ROV Interface:	Interface Description:
Ref Company Doc:	Document Title: Riser Base Installation Specifications
ROV TASK ACTIVITY SEQUENCE	
Task Description:	
<ul style="list-style-type: none"> ROV to assist during installation/retrieval of Riser Base 	
Preparatory Tasks:	
<ul style="list-style-type: none"> Removable bullseye installed on suction anchor 	
Equipment Required:	
<ul style="list-style-type: none"> Standard ROV c/w 7F and 5F. Calibrated MRU (optional, not Jotne supply) Calibrated Gyro (optional, not jotne supply) Wire cutter (precautionary) 	
Cautions:	
<ul style="list-style-type: none"> Heavy loads. Good weather required. Max 0.5m/s landing speed 	
Task Sequence:	
Installing	
<ul style="list-style-type: none"> Lower Riser Base down towards seabed Stop lowering when Riser Base has adequate clearance to seabed. (heave dependant) ROV to fly to the Riser Base and grab the structure to assist with correct positioning and alignment for landing Using the ROV and gyro for keeping heading reference of Riser Base, lower, and allow structure to land onto seabed, using the MRU and bulls-eye as reference for correct installation tolerances Perform an As-built survey prior to removal of lifting slings Disconnect lifting slings when suction anchor has been correctly installed. Task No. 1.2 	
Retrieval	
<ul style="list-style-type: none"> Perform a pre-lift survey The lifting slings are connected to the Riser Base, ref Task No. 1.2 Tension up on lift wire until load is taken on crane. Keep tension on wire until crane is able to lift Riser Base from seabed. Verify structure is clear of seabed then recover to deck 	

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ROV TASK DESCRIPTION AND REFERENCE DOCUMENTATION

Task No: 1.2	Task: Retrieve / Install Lifting Slings
ROV Interface:	Interface Description:
Ref Company Doc:	Document Title: Riser Base OMM

ROV TASK ACTIVITY SEQUENCE

Task Description:

- ROV to assist in installation / retrieval of lifting slings

Preparatory Tasks:

- N/A

Equipment Required:

- Standard ROV c/w 7F and 5F.

Cautions:

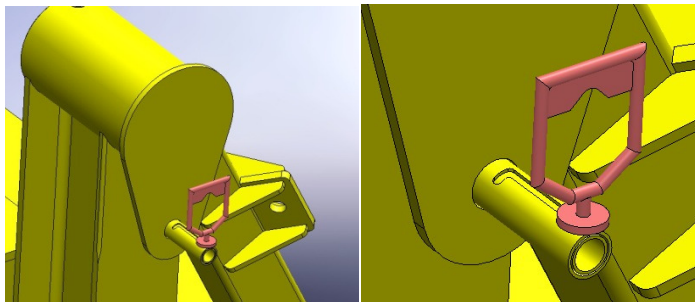
Task Sequence:

Retrieval

- After Structure in position, lower crane until slings are slack
- Retract securing pin in lifting trunnion to U (unlock) 4 off
- Lift sling loops over trunnions and fly ROV up to lifting hook and secure slings to storage hook
- Re-insert securing pin to L (lock) 4 off
- Recover slings

Installation

- Installation is reversal of above 1 to 5



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OPTIONAL TASK (PENDING)

ROV TASK DESCRIPTION AND REFERENCE DOCUMENTATION	
Task No: 1.3	Task: Reading of Roll / Pitch Indicator (bullseye)
ROV Interface:	Interface Description: Roll and pitch indicator (Pending)
Ref Company Doc:	Document Title: Riser Base OMM
ROV TASK ACTIVITY SEQUENCE	
Task Description: <ul style="list-style-type: none"> There is one roll and pitch indicator (bullseye) located on the Riser Base. 	
Preparatory Tasks: <ul style="list-style-type: none"> Clean bullseye before Riser base installation 	
Equipment Required: <ul style="list-style-type: none"> Standard ROV c/w 7F and 5F. 	
Cautions: <ul style="list-style-type: none"> Avoid scratching bullseye dome with metal objects (Manipulators) 	
Task Sequence: <ul style="list-style-type: none"> Visually check indicator position in bullseye and log position after Riser Base is installed and prior to disconnecting 	

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Tasks 2. – RISER BASE INTERVENTION TASKS

ROV TASK DESCRIPTION AND REFERENCE DOCUMENTATION	
Task No: 2.1	Task: 10” Top Entry Ball Valve ROV Operated
ROV Interface: 18BL8912 18BL8914 18EV8911 18EV0004	Interface Description: ROV Operated ROV Operated Primarily Actuated but can be used as ROV operated. Contingency Primarily Actuated but can be used as ROV operated. Contingency
Ref Company Doc:	Document Title: Valve Manufacturer OMM 80kNm Torque Tool OMM HP Protection Cap OMM 2,7kNm TT with class 1-3 interface OMM
ROV TASK ACTIVITY SEQUENCE	
Task Description: <ul style="list-style-type: none"> The Riser Base has 4 off 10” Top Entry Ball Valves. 2 off valves have actuators installed, and 2 off have HP protection caps installed. The actuators are interchangeable with the 2 valves with protection caps if necessary. This task covers operations on the valves without actuators. 	
Preparatory Tasks: <ul style="list-style-type: none"> Install Quad port hot stab on ROV Read and log indicator position prior to operation of valves Calibrate the 80kNm torque tool 	
Equipment Required: <ul style="list-style-type: none"> 80kNm Torque Tool Standard ROV c/w 7F and 5F. Data sheet for relevant valve Quad port hot stab Torque Tool Class 4 with class 1-3 adaptor 	
Cautions: <ul style="list-style-type: none"> Check for correct values, don't over torque valves 	
Task Sequence: <ul style="list-style-type: none"> Locate the ROV at the correct valve on the Riser Base. Ref Riser Base OMM Remove the HP protection cap. See fig 1 Ref protection cap OMM Visually confirm the position of the relevant valve via the indicator on the stem. See fig 2 Install the 80kNm torque tool onto the valve stem. Insert the quad port hot stab into the torque tool receptacle Operate the torque tool as stated in the OMM to land the tool correctly onto the valve stem Open or close the valve by turning the torque tool as required:- Open = (O) = counter-clockwise (CCW) ¼ turn Shut = (S) = clockwise (CW) ¼ turn Remove the torque tool. Reinstall the HP protection cap 	

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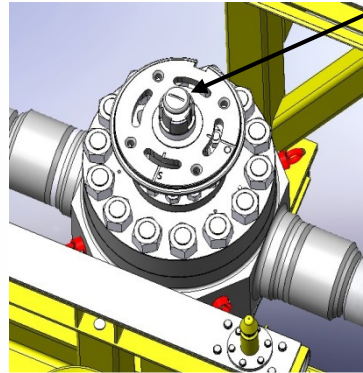
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Fig 1



Fig 2



Valve Indicator

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ROV TASK DESCRIPTION AND REFERENCE DOCUMENTATION

Task No: 2.2	Task: 10" Actuated Top Entry Ball Valve
ROV Interface: 18EV8911 18EV0004 18BL8912 18BL8914	Interface Description: Primarily Actuated but can be used as ROV operated. Contingency Primarily Actuated but can be used as ROV operated. Contingency ROV Operated ROV Operated
Ref Company Doc:	Document Title: Riser Base OMM Subsea HPU OMM Actuator and Valve OMM

ROV TASK ACTIVITY SEQUENCE

Task Description:

- The Riser Base has 4 off 10" Top Entry Ball Valves. 2 off valves have actuators installed, and 2 off have HP protection caps installed. The actuators are interchangeable with the 2 valves with protection caps if necessary.
- The valves are type FSC (kept open, using the actuator, by pressure from surface via umbilical and HFL) but can be opened by pressurizing the actuator using an external power pack should surface pressure fail and valve closes.
- This task covers operations on the valves with actuators.

Preparatory Tasks:

Equipment Required:

- External subsea power pack (HPU) skid with hoses and stabs
- Standard ROV c/w 7F and 5F.
- Data sheet for relevant valve

Cautions:

- Check for correct actuator operating pressure and set HPU accordingly

• **Task Sequence:**

- Lower the subsea HPU skid to seabed using crane. Position with ROV
- Locate the ROV to the correct actuated valve. Ref Riser Base OMM
- Remove and park the HFL with surface supply from receptacle P. **Fig 1**
- Stab the pressure line to P from the subsea HPU. **Fig 1**
- The HFL connected to receptacle V is the return to the fluid accumulator bank situated on the Riser Base and must be left in situ during the HPU operations on the actuator
- Pressurize the HPU with correct pressure to override the actuator FSC.
- Monitor the O-S indicator on top of the actuator. **Fig 2**
- Pressure must be maintained to hold valve open.
- When surface supply has been re-established release HPU pressure. Valve goes to FSC.
- Remove the HPU stab from receptacle P.
- Re-insert the stab receptacle with surface supply.
- Recover HPU skid to surface

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