

<p><b>KLM Technology Group</b></p> <p>Project Engineering Standard</p>	<div style="text-align: center;">  <p><b>KLM</b>      <b>Technology Group</b></p> </div> <p style="text-align: center;"><a href="http://www.klmtechgroup.com">www.klmtechgroup.com</a></p>	<p>Page : 1 of 24</p> <hr/> <p>Rev: 01</p> <hr/> <p>August 2013</p>
<p>KLM Technology Group #03-12 Block Aronia, Jalan Sri Perkasa 2 Taman Tampoi Utama 81200 Johor Bahru Malaysia</p>	<p><b>OFF SHORE COMMISSIONING PROCEDURES AND PERFORMANCE TESTS</b></p> <p><b>(PROJECT STANDARDS AND SPECIFICATIONS)</b></p>	

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## SCOPE

This Project Standards and Specifications specify the minimum requirements for the process design of off shore commissioning procedures and performance tests.

## INTRODUCTION

Contractor shall pre-commission, commission and carry out the Performance Tests on the Works including all the facilities of the Well Platform, associated pipelines, and Modification Works listed in Description of Work in the Bid Package.

This procedure defines the following states of the Works:

- Mechanical Completion
- Ready for Pre Commissioning
- Ready for Commissioning

This Procedure also describes Performance Tests & Pre-commissioning activities.

For other requirements of testing refer Basic Bid Work, respective Design Criteria and respective Functional Specification given elsewhere in Bid Package.

A Commissioning or Pre-commissioning activity shall be considered to be complete only when it has been witnessed and the procedure and the results of successfully carrying out that procedure have been signed off by both Contractor and Company. Company may also require Vendor's representative to witness and sign that document.

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## DEFINITIONS

### A. Mechanical Completion

Mechanical completion of a system includes following but not limited to:

1. All design and engineering has been completed
2. All installation work for that system including all equipment has been completed in accordance with "Approved for Construction" drawings, specifications, applicable codes and regulations and good engineering practices, all tie-in connections have been made, all testing and inspection completed and system/facilities are ready for pre-commissioning.
3. All instruments have been installed.
4. All tie-in connections have been made.
5. All factory acceptance tests and all other testing and inspection activities have been completed.
6. Contractor has obtained all relevant approvals from the Company.
7. Safety Studies have been completed and satisfaction of all the Safety Studies' requirements, have been met and all documentation put in place.
8. All required documentation and certification documents required by the Contract have been supplied.
9. All operating procedures and maintenance procedures have been forwarded to the Company well in advance for review.
10. All items for which Contractor is responsible for obtaining third party, regulatory or Company approval have been obtained and confirmation documentation has been provided to Company.

Mechanical completion of a Well Platform is defined as the state where all systems including utility and auxiliary facilities have reached the condition of pre-commissioning stage and accordingly certified by the company.

Mechanical Completion of Modification Works is defined as the state when all the modifications including all utilities & auxiliary facilities have reached the condition of pre-commissioning stage and accordingly certified by the Company.

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## **B. Ready for Pre-Commissioning**

The works is ready for Pre-Commissioning when the Company has issued a certificate for Mechanical Completion and notification in writing that the Works is ready for Pre-Commissioning.

## **C. Pre-commissioning Activities**

Pre-commissioning activities are activities to be performed after Mechanical Completion of a piece of equipment or system to make it safe and ready to receive hydrocarbons and Ready for Commissioning. This includes, but not limited to:

1. Performance of all remaining works other than commissioning and Performance Tests.
2. Making operational and commissioning all systems that can be made operational before process fluids are introduced.
3. The completion and testing of the platform equipment & systems
4. Testing of all parts and systems of the Works including the communications systems (if required).
5. Provision of initial fill of packing, chemicals, inhibitors, lubricants, glycol, water and other stocks have been made.
6. Provision of temporary launcher/receiver, if required, to carry out pre-commissioning activities for the pipelines, checking site modifications.
7. Internal inspection of the vessels
8. Flushing/cleaning of vessels & piping
9. Hydro-testing and pneumatic testing of vessels, piping and pipelines.
10. Calibration of PSVs.
11. Calibration of all the instruments
12. Loop checking.
13. Complete checking of the safety system
14. Checks on electrical system and other vendor packages.

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15. The delivery, storage and cataloguing of all spares
16. Items for which defect notices are issued by Company at any earlier stage are to be rectified and all defect notices shall have been closed out prior to this activity.
17. The completion documents along with all design documents to as-built
18. The preparation of the commissioning plan and submission to Company for review.
19. Removal of all debris and construction equipment from Site.

Further details are given in Attachment A.

#### **D. Ready for Commissioning**

Ready for Commissioning means the point at which the Company issues a certificate to the Contractor saying that the system is ready for commissioning. Ready for commissioning status shall be jointly reviewed by the company/contractor.

At this point all systems and equipment shall be at a stage where process fluids can be safely introduced and all equipment can be safely operated with all controls and safety devices in service to meet the requirement as per design specification.

#### **EXECUTION OF PRE-COMMISSIONING ACTIVITIES**

Contractor shall complete all the pre-commissioning activities in accordance with guidelines given in API-700 and conditions stipulated under Attachment A. Contractor shall write necessary procedures and obtain approval from Company prior to commencing work and shall carry out the work in accordance with approved procedures.

The Contractor shall complete as many of the pre-commissioning activities as possible at the fabrication yard to minimize the working time in offshore. A guideline for carrying out the pre-commissioning activities at yard/offshore is given below. These are minimum requirements only.

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Contractor shall repeat these yard tests in offshore in so far as is necessary to demonstrate that the equipment has not been damaged and that it is in the same condition as it was when first tested.

The Contractor shall submit a detailed schedule and procedure for carrying out these activities for approval by the Company before starting work.

**A. Factory Acceptance Test Requirements (FAT)**

As a minimum, Factory Acceptance Test shall be required on the following packages:

1. Crane
2. Custody transfer gas metering skid.
3. GCI Transfer/ Injection Pump
4. Crude Condensate Transfer Pump
5. HIPPS System
6. HPU Units
7. DCP Skid with Hose Reel
8. Well / Fire Shutdown System
9. Nav-Aid System along with battery, Solar Panel and solar power Controller
10. Gas Detection System
11. Condensate metering system.

This list shall be considered as a minimum and shall be supplemented with other items based upon requirement indicated in respective functions specifications. The Contractor shall define factory Acceptance Testing Requirements as a part of all Purchase Requisitions. This requirement shall be submitted to the Company for approval prior to the award of a purchase order. The packages shall be tested with the ancillary equipment that is to be supplied with them.

Factory Acceptance Testing of Instrumentation related equipment shall be as per Functional Specifications of the respective instrument items.