Panel Session 2
SUPPLY AND INSTALLATION OF OFFSHORE WELLHEAD FACILITIES (OWF) AND OPTIMIZING INTEGRATED COMPUTERIZE SYSTEM

Hisham
Deputy Director, E&P
Malaysia Marine & Heavy Engineering
MALAYSIA MARINE & HEAVY ENGINEERING

SUPPLY AND INSTALLATION OF OFFSHORE WELLHEAD FACILITIES (OWF) AND OPTIMIZING INTEGRATED COMPUTERIZE SYSTEM

25th Sept. 2018
Contents

• OWF Substructure Design Concept
• OWF Topsides & Substructure Category
• Comparison between OWF contract and normal contract
• OWF - Braced Monopod Design (Zeepod)
• OWF - Fabrication Facilities
• Project Computerize System
Current market change has renewed interest in marginal fields to optimize the CAPEX cost, hence enabling the development of new fields.

A fresh look at the technology and concepts is required to develop marginal shallow water fields using a minimal platform approach.

In exploring concepts, minimal platform designers and operators are looking at deck simplification, minimization of environmental impact, low visit design, reusable solutions, alternative installation solutions and platform automation.
**Comparison between OWF Contract and Normal Contract**

### Normal Contract arrangement

| Description               | Duration | Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---------------------------|----------|-------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Conventional method      | 24       |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Pre-FEED                 | 2        |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| FEED bidding exercise    | 2        |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Front End Engineering    | 4        |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| EPCIC Bidding            | 4        |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| EPCIC Execution          | 12       |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Drilling campaign        | 3        |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| HUC                      | 1        |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| First Oil                | -        |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

### OWF Method

| Description               | Duration | Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---------------------------|----------|-------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OWF standard Method       | 10.5     |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Pre- FEED                | 1.5      |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Early involvement by EPCIC| 1        |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| OWF EPCIC                | 9        |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Drilling campaign        | 3        |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| HUC                      | 1        |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| First Oil                | -        |       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

- By Client
- By Contractor
• Inside battery limit for OWF is defined as last flange downstream of SDV at any export line.

• The Christmas Tree will be supplied and installed by others.
**OWF - Braced Monopod Design (Zeepod)**

- ZeePod is a monopod based structure but braced like a tripod.
- It is designed for use in shallow water up to water depth of 85m.
- It can accommodate Topside with maximum operating weight of 1000MT.
- ZeePod is designed for simplicity in fabrication, transportation and installation with maximum lifting module up to 800MT.
- It is a cost effective and proven solution with over 40 such installations in Indonesia.

**Fabrication advantages:**

- Less platform total steel weight as compared to conventional tripod i.e. no trunnions, bracings, shim plates, spacer plates.
- Consist of small components i.e. top sleeve and seabed template thus reducing fabrication and handling costs.

**Offshore installation cost savings:**

- Can be installed by low capacity crane barge or drilling rig.
- Very quick offshore installation, less offshore handling and no upending frame.
- Small offshore weather window required; lower risk on waiting due to weather.
- All Topsides & Substructure components including piles can be transported in a single barge.
OWF - BRACED MONOPOD DESIGN (ZEEPOD)
OWF - BRACED MONOPOD DESIGN (ZEEPOD) – COMPONENT

Typical Installation of ZEEPOD Substructure, Boat Landing and Topside

ZEEPOD substructure consist of several structural components:

1. Central Caisson
2. Raker Pile
3. Top Sleeve
4. Subsea Template
5. Boat Landing
6. Conductors
7. Topside
OWF - Braced Monopod Design (ZEEPod)

ZEEPod History

- ZEEPod first installation in year 2000 for Maxus (Indonesia)
- Prototype was called Y2K Platform
- Currently about 40 installations in Indonesia
OWF - FABRICATION FACILITIES

LIFTING OF DECK INSIDE MEGA WORKSHOP AT MMHE YARD
OWF STRATEGY AND BENEFIT

Benefit from a long-term contract/relationship to deliver cost effective solutions

• Better Schedule and faster delivery.
  – MMHE has done 5 nos satellite platforms for Exxon Mobile project and the first delivery is 8 month. Subsequently 1 platform every month.

• Better on pricing
  – Vendors can provide competitive price based on volume.
  – Optimizing resources and facilities since there are no mob-demob and new facilities cost, i.e. client and PMT office.

• Reduce approval for development cycle.
  – There are no cycle for development approval such as tender and evaluation exercise. Contractor can have frequent discussion on the engineering proposal and development.
OWF - Strategy and Benefit

• Management of OWF project using in house computerize system
What is Project Computerize Management System?

- Systematic project system to monitor project execution from design until commissioning and handover to client.
- Trace progress during the design, procurement, installation and commissioning phase and data will be maintained electronically.
- The process provides a fully integrated, multi-discipline approach to the planning, execution and documentation of the inspection and testing activities during each phase.
Co-Track Solution

‘Project Completion & Tracking Management System’

Our in-house developed computerized system works to monitor project execution from engineering until commissioning and handover to client.
**MODULES IN CO-TRACK**

**EDAS (Engineering Design Database System)**
A central database to capture and update engineering data which include tag and other attribute, drawing information & datasheets. Source data for integration for e-Matrack, PMS, CPT, OCMS and SMS.

**eMatrack (Electronic Material Tracking System)**
A tool to track material management from receiving by warehouse until issuing to project site.

**PMS (Preservation Management System)**
A tool to capture and record the pre-inspection of the material arrival at warehouse followed by joint inspection together with QA/QC, PMT and client.

**CPT (Construction Progress Tracking)**
To record and report fabrication/installation by PMT and verification by QA/QC status of Engineering System, Area, package and/or individual tag items at site.

**OCMS (Onshore Offshore Completion Management System)**
To record and report status of Mechanical Completions, Pre-Commissioning and Commissioning packages, Mechanical Completions package and/or individual tag items.

**SMS (Shiploose Management System)**
To record, report & track for all Shiploose item from onshore to offshore. This system helps warehouse, PMT & Commissioning team to track their item.
MODULES IN CO-Track

STAKEHOLDERS

EDAS (Engineering Design Database System)
- Design Engineering
  - Design Engineer
  - Engineering Coordinator

eMatrack (Electronic Material Tracking System)
- Warehouse
  - Material Coordinator
  - Material Inspector
  - PMT
    - Project Management

PMS (Preservation Management System)
- Material Coordinator
  - Warehouse
  - Project Management
  - Mechanical Completion
  - Pre-Commissioning
  - Commissioning
  - Offshore

CPT (Construction Progress Tracking)
- PMT
  - Construction Planner
  - Project Management
  - Mechanical Completion
  - Subcontractor

OCMS (Onshore Offshore Completion Management System)
- Testing & Commissioning
  - Mechanical Completion
  - Pre-Commissioning
  - Commissioning
  - Inspector
  - Client

SMS (Shiploose Management System)
- Design Engineering
  - Design Engineer
  - Engineering Coordinator
  - Warehouse
  - Material Coordinator
  - Material Inspector
  - Offshore

Management
INTEGRATED SYSTEM

EDAS : Engineering Data Management System
OCMS : Offshore Completion management system
CPT  : Construction Progress Tracking
SMS  : Shiploose Management System
PMS  : Preservation Management system
EDAS System Flow

Integration with project applications

- CPT
- PMS
- OCMS
- e-Matrack
- SMS

Engineering data/Shop drawing → Excel Template → Schedule Upload (Auto)

Immediate Upload (Manual)

Link data to Various module

EDAS
eMATRACK SYSTEM FLOW

1. Receiving
2. MAC Creation
3. MAC Approval
4. GRN Creation in e-Mattract
5. Online submission via e-Subcon
6. Email notification to Supplier for Invoice submission
7. RFC Program
8. Update to SAP
9. Update Doc Ref. No
PMS SYSTEM FLOW

- Preservation List
- Periodical Maintenance
- MIRN Maintenance
- Checklist Maintenance
- Checklist Printing
- Upload Document
- Checklist Association
- Checklist Acceptance
- Preservation History

PMS reporting
CPT System Flow

- EDAS
- CPT database
- Engineering Tags & details
- Project & user setup by admin
- Source Data
  - Auto assign by planning activity
  - Manual design
- Construction Status by PMT
- Inspection by QA/QC
- Rework
- Acceptable & Signoff
- Upload scan ITP barcode
- Generate various CPT report
- Trigger ITR A
**OCMS SYSTEM FLOW**

- **System Admin**
  - Project Setup
  - Register user access
  - Upload tag
  - Association with ITR
  - Generate handover certs

- **PMT**
  - Construction at site

- **Mechanical Completion Team**
  - Print / Issue ITR A
  - Inspection at site

- **Pre-Commissioning Team**
  - Print / Issue ITR B
  - Pre-Commissioning at site

- **Client**
  - Punchlist
  - ITR Approval

Completion Progress Report & Upload Document
CoTrack provides a better solution in providing visibility of project execution and progress

**VALIDATION SIMPLIFIED**
Utilization of barcodes to QC reports, check sheets, punch lists, and certificates for seamless validation task

**TRANSPARENCY**
Produce variety range of reports including graphical reports that provide visibility progress and deliverables. Promote accountability between relevant parties

**TRACEABILITY**
Traceability of work progress by areas, discipline and available display as hierarchical systems, subsystems, area certificates

**EASY HANOVER**
Efficient preparation and handling towards project handover
Thank You

MALAYSIA MARINE AND HEAVY ENGINEERING HOLDINGS BERHAD (178821-X)
Level 31, Menara Dayabumi,
Jalan Sultan Hishamuddin,
50050 Kuala Lumpur, Malaysia
T : +603 2273 0266
F : +603 2273 8916
W : www.mhb.com.my

MALAYSIA MARINE AND HEAVY ENGINEERING SDN BHD (14558-P)
(a wholly owned subsidiary of MHB)
MMHE West, PLO 3,
Jalan Pekeliling, P.O.Box 77,
81700 Pasir Gudang, Johor, Malaysia
T : +607 268 2111
F : +607 278 4162