Technical Session: Best Practices, Challenges & Lesson Learnt in EPCIC Projects

Title: Decommissioning of Kapal Wellbay Module, its Support Structure & MOPU Mobile Producer 1 for Vestigo Petroleum / PETRONAS

Zakri Alwi
Chief Executive Officer
zakri@redtechoffshore.com
Title: Decommissioning of Kapal Wellbay Module, its Support Structure & MOPU Mobile Producer 1 for Vestigo Petroleum / PETRONAS

Field Overview:
The KAPAL field is operated by Coastal Energy Consortium Sdn. Bhd. The field is located 79 km offshore Malaysia in block PM316 in South China Sea. Start-up of the field was in year 2012.

The KAPAL Offshore complex comprises the following platforms:
- One (1) Conductor Supported Wellhead Platform
- One (1) MOPU named Mobile Producer 1
- One (1) Double Hull Storage Tanker named Duta Pacific (FSO DP)
- One (1) x 6”OD, 750 m length flexible pipeline

Decommissioning Projects

1. Provision of Engineering, Preparation, Removal and Disposal of Kapal Wellbay Module & its Support Structure (Kapal Field Decommissioning)
   Campaign 1 & 2: September 2016 – December 2016

2. Provision for Demobilization of MOPU MP1
   Phase 1, 2, 3: February 2017 – August 2017
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PROJECT 1:
Provision of Engineering, Preparation, Removal and Disposal of Kapal Wellbay Module & its Support Structure

Job Scope

E - Engineering

- Severance Methodology, Lifting Analysis, Onshore Loading Analysis, Cutting Sequence for Demolition, Grillage and Sea Fastening

P – Preparation

- Procedures Preparation: HSE Plan, Detail Decommissioning, Underwater Diving, NDT, PQP, Waste Management, Environmental Monitoring
- Procurement and subcontracting
- Rig up equipment onto Work Barge and Anchor Handling Tug
- Mobilisation of construction crew and marine spread to work site
- Critical Risk Assessment

R – Removal

<table>
<thead>
<tr>
<th>No</th>
<th>Object List</th>
<th>Weight (MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Two (2) no. burner boom at MOPU EP 5</td>
<td>8.50 each</td>
</tr>
<tr>
<td>2.</td>
<td>Wellbay Framing</td>
<td>53.0</td>
</tr>
<tr>
<td>3.</td>
<td>Four (4) no. for 36” x 1.5” conductors come with 13 3/8” surface casing, cemented annulus</td>
<td>173.0 each</td>
</tr>
<tr>
<td>4.</td>
<td>One (1) no. of 36” pin pile</td>
<td>61.0</td>
</tr>
<tr>
<td>5.</td>
<td>Mid span bracing framing</td>
<td>43.0</td>
</tr>
<tr>
<td>6.</td>
<td>Subsea Template framing</td>
<td>20.0</td>
</tr>
<tr>
<td>7.</td>
<td>Eight (8) units of Anchor</td>
<td>12.0 each</td>
</tr>
<tr>
<td>8.</td>
<td>Eight (8) length of mooring chain between 450m – 620m</td>
<td>60.0 – 85.0</td>
</tr>
</tbody>
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D – Disposal
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Lessons Learnt in Project 1 -
Provision of Engineering, Preparation, Removal and Disposal of Kapal Wellbay Module & its Support Structure (Kapal Field Decommissioning)

<table>
<thead>
<tr>
<th>No</th>
<th>Challenges</th>
<th>Problem Statement</th>
<th>Lesson Learned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Engineering: Last-minute changes on operation methodology &amp; utilization of barge.</td>
<td>Final and crucial rectification, re-calculation &amp; re-run analysis need to be done.</td>
<td>- Conduct internal meeting constantly &amp; regular cross checking between engineering and operation team.</td>
</tr>
</tbody>
</table>
| 2  | Industrial Issue – DSL application: Vessel (foreign flag) has been blocked by another Malaysian vessel owner. | Impact on the differences of technical specs, daily charter rate and schedule. | - Contractor is recommended to do selection from the vessels proposed by MASA.  
- All parties shall conduct further discussion with MASA to address issues, impact on schedule, technical specs, daily charter rate & costs. |
| 3  | Weather condition during monsoon season and heavy lift and cutting activities may lead to unsafe environment. | - Emphasize strongly on "ZeR0 Incident & ZeR0 Accident" (ZIZA) campaign.  
- Ensure life saving appliances are always in good condition and apply Stop Work Policy when required.  
- Early planning to avoid monsoon window. |
| 4  | Offshore VSAT communication performance. | Unclear definition of "High Speed Internet" which results in communication bottleneck and slowdown. | - Data speed requirement needs to be stated clearly and requested upfront.  
- Data usage policy needs to be developed as a precautionary measure. |
| 5  | Contractor’s opportunity to do site visit. | Due to tight schedule given, Contractor does not have the opportunity to carry out site assessment. | - Contractor shall be allowed to carry out site assessment prior to Decommissioning campaign. |
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PROJECT 2:
Provision of Demobilisation of MOPU Mobile Producer 1

Job Scope

**PHASE 1**
- Main Objective: To inspect and confirm Mud Mat integrity
- Carry out Buoyant Tank integrity by NDT Method (FMD)
- Debris removal at MOPU

**PHASE 2**
- Main Objective: To have conformity with existing condition able for safety tow
- Risk Assessment & Engineering Conclusion

**PHASE 3**
- Main Objective: Execution phase according to the engineering solutions
- Rigdown two (2) no. of Flare Boom and sea fastening on MOPU deck
- Replacement of new towing bracket
- Planning for tow under damaged condition
- Post Tow Survey
- Provision of Loadline Certificate- Single Voyage
- Provision of Rig Mover, Jacking Specialist, Hydraulic & Mechanical Specialist, Electrical / Electronic Specialist and Tow Master
- Jacking & towing operation of MOPU to Layup area in Johor
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Lessons Learnt in Project 2 -
Provision of Demobilisation of MOPU Mobile Producer 1

<table>
<thead>
<tr>
<th>No</th>
<th>Main Challenges</th>
<th>Problem Statement</th>
<th>Lesson Learned</th>
</tr>
</thead>
</table>
| 1  | Document Preparation Difficulties       | Insufficient & inaccurate data provided to Contractor results in double job execution and time constraints. | • Expedite sourcing process & hiring the tow vessel prior to submission.  
  • Several conservative assumptions have to be developed based on engineering experiences. |
| 2  | Towing preparation:                     | Dismantling the diesel engine generator exhaust pipe, bunker hose and pipe fitting surrounding the hull. | • Organize adequate time frame for site visit with the presence of Client's technical person-in-charge.  
  • Re-prioritize work plan and work schedule. |
| 3  | Communication:                          | Conflicting instructions may affect Crane Operator & Vessel Master to perform the work. | • Coordinate meeting for lifting activities to be addressed only to the Lead Rigger for coordination with other parties.  
  • Assigned specific channel for lifting operation. |
| 4  | Managing and maintaining incumbent subcontractors. | Time consuming on the evaluation process, and in maintaining commercial arrangements and agreements. | • Ensure incumbent suppliers are capable, familiar with scope of work, have sufficient equipment & manpower to perform the work. |