Overview of Decommissioning in Malaysia

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1.0 Objective

To provide overview of decommissioning in Malaysia.
By virtue of being the owner of petroleum resources, PETRONAS is fully accountable for decommissioning of upstream facilities

- PDA 1974 vested PETRONAS with “the entire ownership in, and the exclusive rights, powers, liberties and privileges of exploring, exploiting, winning and obtaining petroleum whether onshore or offshore of Malaysia”, making PETRONAS the sole concessionaire of petroleum resource in Malaysia.

- PSC documents further specify that PETRONAS shall have legal title to equipments and assets for petroleum operations, giving PETRONAS ownership of the upstream facilities.

These empowerment directly held PETRONAS accountable for the upstream facilities decommissioning responsibility, liability and its residual liability.
2.0 Overview of Structures in Malaysia

• To date, there are over 300 platforms installed and nearly 600 pipelines laid offshore Malaysia.

• Of the total, 60% of the platforms and pipelines are more than 20 years of age.

• Majority of the offshore fields are located in shallow water, resulting in 97% of platforms are in water depth of less than 100 meters.
3.0 Decommissioning Process

- The process is established in Section 10 of PETRONAS Procedure and Guidelines for Upstream Activities (PPGUA) whereby it provides the guidelines and requirements for the decommissioning of upstream installations.

- Petroleum Management (PMU), as the custodian and statutory manager of the national petroleum resources in Malaysia is obligated to address the process of the decommissioning of all disused upstream installations that have ceased to accommodate oil and gas production, or are at the end of their design life, consistent with the national laws and international conventions.

- Decommissioning in PPGUA is defined as a process to put disused structure and installations out of service.

- The activity is driven by the following factors, but not limited to:
  1. Safe operations of the facilities towards integrity and HSE.
  2. End of field economic life
  3. Legislative requirement

- Integral part of managing facilities integrity and reliability is the adoption of full asset life cycle (or cradle to grave) management concept encompassing all phases in facilities life cycle – from conceptualization up to decommissioning
3.0 Decommissioning Process

Decommissioning preparation starts as early as 3-5 years before the actual execution. The flow below simplifies the process:

**Field Review**
- FFR
- Integrity/ HSE
- Legislative Requirements

**Pre-Decommissioning Works**
- Study Options (BPEOA)
- WPB
- Decommissioning Plan
- Consultation with Government.

**Decommissioning Execution Phase**
- Wells
- Pipelines
- Topside
- Sub-structure
- FSO/FPSO/SPAR
- Subsea Wellhead
- Environmental Monitoring

**Post Decommissioning**
- Site Clearance
- Verification
- Residual Liability
- Close Out Report
- Environmental Monitoring
- Degazetting and Admiralty Chart
4.0 Decommissioning Option

- **Removal to shore and sell as scrap metal**
- **Conversion to tourist attraction**
- **Removal to reef site as artificial reef e.g. Baram 8 structure was placed at Kenyalang Artificial Reef site, Miri.**
- **Reuse for oil and gas purpose e.g. D21 platform and jacket topside**

- **Reuse for purpose other than oil and gas e.g. Wind Turbine Base, Search and Rescue Base (SAR), etc**

- **Leave in-situ**

*Image source: PETRONAS*
5.0 Rigs to Reef

• Rigs to reef is an activity to convert decommissioned offshore oil and petroleum rigs into artificial reefs at a dedicated reef site.

• The three (3) options of rigs to reef are:
  1. Remove the structure and tow to an approved reef site.
  2. Partial removal to place the removed top section in-situ or tow to an approved site.
  3. Toppling by removing the structure below mud line and leave in-site.

• The latest decommissioning activity done in Malaysia is for SMG-4 and SMJT-A, in 2012 for structure removal. Well abandonment was done back in 2009 due to rig idle opportunity.

• In Malaysia, there is only 1 rigs to reef project done back in 2004 i.e. Baram-8.

• Benefits of rigs to reef:
  1. Cheaper alternative (provided identified reef site is not far from platform location)
  2. Improve biological activity
  3. Improve ecological connectivity
  4. Enhance existing reef site
6.0 Decommissioning Experience in Malaysia: Baram 8 platform

Engagement with stakeholders is one of the pre-conditions for successful decommissioning activity

- PETRONAS & PSC
- Govt. Authorities
- Local Community
- Academia
- STAKEHOLDERS
- Natural Resources and Env. Board
- Department of Environment
- State Planning Unit
- Ministry of Tourism
- Marine Department
- UNIMAS
- Curtin University
- Community leaders
- Fishermen
- Divers
6.0 Decommissioning Experience in Malaysia: Baram 8 platform

Execution of Baram 8 platform decommissioning is divided into three (3) main phases.

1. **Phase 1 – Investigate Well Pressure**
   - Completed Oct 2001
   - Diver assisted investigation and prepare well for rig-assisted abandonment

2. **Phase 2 – Abandon Well**
   - Completed Aug 2002
   - Retrieve tubing, set cement

3. **Phase 3a – Decommission Pipeline**
   - Completed Nov 2002
   - Clean, remove risers, cap ends, leave in-situ

4. **Phase 3b – Decommission Platform**
   - Completed Nov 2004
   - Cut, lift on barge, transport to reef site and place as artificial rift
6.0 Decommissioning Experience in Malaysia: Baram 8 platform

- BA-8, a three (3) legged steel structure was installed in 1968 at a water depth of approximately 54 m in the basin of Baram, it has only
- Location is ideal for marine life, coral growth and scuba/ sport diving as designated by the Marine Fisheries Department to promote tourism in Miri, Sarawak, Malaysia.
- Distance from platform location to the designated reef site is roughly 25 nautical miles.
- Platform collapsed in December 1975 and relocated to the reef site (Kenyalang Reef Site) with water depth of around 21 m.

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**Structure Removal and Relocation to Reef Site**

- **At BA-8 site**: Salvage or Recovery (approx. 12 days)
- **Transportation**: Towing (approx. 1 day)
- **At Reef site**: Placement (approx. 2 days)
6.0 Decommissioning Experience in Malaysia: Samarang-4 and Jacket platform

<table>
<thead>
<tr>
<th>No</th>
<th>Facility</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SM-4 platform</td>
<td>Completed in May 2012</td>
</tr>
<tr>
<td>2</td>
<td>SMV-A Vent</td>
<td>Completed in May 2012</td>
</tr>
<tr>
<td>3</td>
<td>SM-4 well</td>
<td>Completed in 2009</td>
</tr>
</tbody>
</table>

Summary

1. SM-4 has ceased production since 1978 and SMV-A became redundant since 2009 after the Vent to Flare Conversion Project executed.

2. The decommissioning process (SM-4 & SMV-AA) started in July 2011 and completed in May 2012 which covers the environmental & site survey, EMP, stakeholders engagement, engineering and execution activity.

3. Technology used are the Diamond Wire Cutting Machine and the Abrasive Water Jet Cutting

4. The actual cost for SM-4 well abandonment is higher due to WoW, preparation days required to make-safe the platform for abandonment operation and rig standby days for waiting the completion and confirmation of soil investigation and site survey.

Removal of SM-4 boat landing and topside

Removal SMV-A vent line and topside.
6.0 Decommissioning Experience in Malaysia: Ketam Production and Vent platform

- Ketam production platform A (KTMP-A) is a four (4) legged jacket structure and Ketam vent A (KTV-A) is a three (3) legged jacket which were decommissioned back in 2003.
- Subsurface review conducted in 1999 concluded that platform is no longer economical to produce. Since then, minimal maintenance is performed to ensure future safe entry.
- Based on the Best Practicable Environmental Option (BPEO) study conducted, below recommendations were made:

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<th>No</th>
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<th>Recommendation/ Remark</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>KTMP-A Jacket</td>
<td>• Onshore disposal - Offshore removal was done with cutting tools (e.g. exothermic torch) and saturation diving set. A flat top barge was later used to transport the facility for demolition site onshore.</td>
</tr>
<tr>
<td>2</td>
<td>KTMP-A Topside</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>KTV-A Structure</td>
<td>• KTMP-A jacket was initially recommended for re-use but no suitable receiving project was identified and the structure had also reached its design life.</td>
</tr>
<tr>
<td>4</td>
<td>Pipelines and drill cuttings</td>
<td>• Leave in-situ – Run bi-di pig to remove contaminant, then was flushed to meet &lt; 100 ppm. Both lines were cut at both ends (&amp; capped) and left in-situ.</td>
</tr>
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The overall offshore removal period was 24 days long.

After decommissioning, monitoring activity was conducted to ensure no detrimental effect to the water and sediment quality.
THANK YOU