

## Adaptive Reuse of Offshore Structure Steel: The Way Forward for Malaysia?

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Since the award of the first risk-service contract (RSC) in 2011, the future marginal field development in Malaysia remains bright with at least 22 fields marked for development this year onwards.

RSCs are based on a fee to cover service and infrastructure cost with a fair return over a particular tenure plus performance bonus for any additional production over and above the agreed threshold.

This is enforced with the government's tax reduction efforts in attracting investments in this sector. Take for instance, a reduced tax for marginal fields from 38% to 25%, and a waiver of export duty on oil produced and exported from marginal field development. Nevertheless, oil produced from these fields would remain a property of PETRONAS.

This relatively new sector is estimated to worth billions of ringgit in investments, as per illustrated in the table below.

*Table 1: Malaysia: Potential contracts in 2013, SOURCE: Companies, DBS Vickers*

Project	Est. value (RM million)	Timeline	Potential beneficiary
Refinery & Petrochemical Integrated Development	60,000	2013-2017	Dialog,Pchem, P. Gas, KNM, MMHE
Pengerang independent deepwater terminal	5,000	2011-2020	Dialog
ExxonMobil's Enhance Oil Recovery (EOR)	10,000	2012-2014	SapuraKencana, MMHE
Shell's chemical EOR	36,000	n. a.	SapuraKencana, Bumi Armada, MMHE
Pan Malaysian Hook-up & commissioning	5,000	1Q13	Dayang, SapuraKencana, Petra Energy
Maikai deepwater field	3,000	2013-2015	MMHE
22 marginal oil fields	54,560	2013-2016	SapuraKencana, Bumi Armada, Dialog
Petronas' drilling plans of 50 wells next 3 years	n. a.	2012-2014	SapuraKencana, MMHE, Dialog, Bumi Armada, UMW
Floating solutions for Belud, Desaru, Terantai, Dahia	n. a.	2013-2015	Bumi Armada, SapuraKencana
North Malay Basin	16,500	2013-2016	Perisai, Wah Seong, MMHE, SapuraKencana

Consequently, development costs become a challenge as these fields need the same expensive infrastructure as conventional large fields, while the expected revenue streams are smaller due to smaller reserve sizes.

Platform reuse is a tangible solution to the quandary, from a technical point of view. In fact, reuse of jack-ups and semi-sub rigs are already in place in the exploration and development phase of most projects.

With plenty of maturing platforms to be decommissioned, reuse of topsides and equipment especially is a feasible and sustainable way forward in Malaysia. Given the maturity of the regional market, there are huge business opportunities for contractors, service specialists, equipment providers, technology developers, consultants and professional service companies over the coming years.

### ***Challenges and Considerations***

The re-use of deteriorated structural systems and equipment, understandably, gives rise to a number of issues. The following concerns could be a boon or a bane for the industry. Note that these are just part of the business considerations to be ruminated on.

- Matching existing reusable system to the production profile of a new project;
- Estimating cost for hire and sale value of the reusable system;
- Deciding between lease of system and ownership; and
- Maximizing benefits of savings in countries with different taxation procedures (for international transactions)

With apt business models in place, the practice of offshore platforms reuse in Gulf of Mexico became a commercially viable one. An estimated 30% of decommissioned topsides and 20% of the jackets are candidates for reuse. Dedicated yards, turnkey contractors and 'brokers' are common occupations associated with this sector.

Decommissioned decks, jackets and equipment are first sent onshore to be stored at yards and submitted to non-destructive testing and inspections. Next comes repairs and (or) priming as necessary and in accordance to API guidelines. Jackets are normally scrapped if they prove to be not cost effective enough to be refurbished. The restored structures and equipment are then stored for sale. Upon transaction, the buyer assumes all liability for the purchase.

Reuse allows operators to minimize the net cost of decommissioning and for the buyer, it allows a cost and time effective means of developing a new field. The following figures exemplify the conditions of a decommissioned deck, before and after refurbishment.



*Figures 1(left) and 2(right): Deck before (left) and after (right) refurbishment. Pictures copyright of Oil & Gas Journal, 1998*

The reuse practice is gradually picking up in the North Sea. In fact, the industry is regularly exceeding 97% of reuse and recycle of all materials and components recovered from decommissioned structures.

Recent projects have seen sections, such as a helideck, cranes, booms, compressors or derrick, being reused in different applications. An accommodation module from a platform is modified to become an office facility at a decommissioning yard which dismantled the topsides. In 1999, the infamous Brent Spar was cut into large sections and used to form the foundations a deep water quay near Stavanger, Norway.

The reuse of complete jacket structures are understandably restricted and are more suited for usage outside of the oil and gas industry due to uncertainties surrounding their long term liability. Alternatively, if reusing a jacket or deck is deemed to be uneconomical, the next logical step would be to recycle the steel.

Figures 3 and 4 below illustrate part of the scrapping process of an 8.7-tonne module support frame.



*Figures 3(left) and 4(right): Scrap and scrap load-out. Pictures copyright of Shetland Decommissioning Consortium*

### **Conclusion**

A change of mind set is definitely imperative for platform and equipment reuse and resale to take off in this region.

Nevertheless, growth potential for recycling of offshore platform steel remains. More than half of the country's existing platforms are in ageing conditions and there are less than ten handling facilities in Malaysia with the capacity to cut up jackets for recycling. Platform fabrication experience is not necessary for receiving offshore platform scrap. Location, sufficient crane capacity and dock facilities are key elements for these yards.

Once overcome, there is a region wide market for offshore facility reuse, recycle or resale for both within the oil and gas industry and in other sectors.

Is adaptive reuse of offshore structure steel the way forward for this region?

*The article represents the personal views of the author(s) and is not in any way affiliated to any associations. This series of articles aims to promote awareness in decommissioning and explore the many end-of-life alternatives of an offshore platform.*

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