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OFFSHORE PLATFORM DECOMMISSIONING: THE NEED FOR A COST INDEX

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Globally, decommissioning of offshore installations has been considered to be one of the biggest challenges facing the oil and gas industry. International conventions on ocean safety now emphasize complete removal rather than reefing. This option is complex, requiring scarce technical expertise and environmental sensitivity in challenging environments. Both governments and operators must develop accurate cost estimates for offshore platform decommissioning. The government requires them to guide its negotiations with decommissioning contractors, while operators require them to determine annual remittances to decommissioning accounts built into modern day oil and gas concession contracts. Consequently, a reliable cost estimation method could be used to define a Zone of Possible Agreement (ZOPA) for offshore platform decommissioning in Malaysian waters before engaging in negotiations with contractors. This would improve value for money and also ensure time value for money. This article looks at current challenges concerning a proposed offshore platform decommissioning price index for Malaysian waters. The conclusion is that these indices are helpful tools for comparisons between conditions across several variables, and are easy to update once developed.

Keywords: Cost index, Malaysian waters, Zone of possible agreement (ZOPA).

1 INTRODUCTION

Energy supply is the backbone of modern societies, spurring economic growth. In Malaysia for example, from 1980 to 2010, energy consumption increased with economic growth (Shaari et al. 2013). In recognition of the importance of energy to societies globally, the energy sector received government subsidies of about $523 billion in 2011 (IEA 2012). While there are various sources of energy, fossil fuel remains the most common and dependable. Globally, there is an increasing demand for energy due in part to economic growth in emerging economies and population growth in developing countries. In response, the oil and gas industry has increased its exploration and drilling activities with the construction of newer, bigger, and more complex platforms to reach these hydrocarbons locked in deep offshore reservoirs.

The complete removal of these platforms at the end of the concession is provided for in the contract. The high cost of removing a platform at the end of production is the responsibility of the operators. For instance, cost increases for the Brent Spar and Ekofisk, due to a change of disposal option from reefing to complete removal, was $38.5 million to $71.4 million and $100 million to $460 million respectively (Osmundsen and Tveterås 2003). However, decommissioning was not provided for in earlier exploration and production concessions (Hamzah 2003). This prior non-inclusion of decommissioning liability has left many national governments with huge liabilities. Therefore, governments must be able to determine reliable decommissioning cost estimates to make negotiations with potential contractors easier. Hence the need for a decommissioning price index that can be updated and used to determine cost estimates at any point in time.

2 DECOMMISSIONING PRACTICES

Decommissioning is the partial or complete removal of offshore/onshore oil platform at the end of the production process. The basic aim of a decommissioning project is to render all wells permanently safe and remove most surface/seabed signs of production activity (Kaiser and Byrd 2005). This has been one of the biggest challenges facing the global oil and gas industry in terms of liability. It is estimated that the value of the market in the Gulf of Mexico (GOM) has reached $2.4 billion (Kaiser and Liu 2014). Although in Malaysia, the quest for complete removal of offshore platforms has few precedents, internationally there has been huge growth in the decommissioning market. This has been spurred by Shell's intended reefing of its Brent Spar (Ibanez 2011) and subsequent policy changes by the Oslo-Paris (OSPAR) commission.

Decommissioning alternatives generally fall under three categories: removal, disposal at sea, and conversion to other uses (Ibanez 2011). However, Article 60 of the United Nations Convention on the Laws of the Seas provides for a general principle of full removal, favored by environmentalists who contend that leaving the structure at sea is hazardous to the marine environment (*ibid*). However, is reported that 10,000 to 30,000 fish live under each platform in the GOM (Stanley and Wilson 2000), hence the importance of keeping the platforms in place. Furthermore, it was found that complete removal as currently required by regulations was not environmentally justified unless the society in question valued a clear seabed and trawling access (Ekins et al. 2006). "Mariculture" on abandoned platforms has also been suggested (Kaiser et al. 2010), and it has been claimed that OSPAR's insistence on complete removal was the result of political pressures (Jørgensen 2012).

There are however certain circumstances where reefing may still be permitted. For example, under the Louisiana Artificial Reef Program (LARP) in the U.S., 35 platforms destroyed during the 2005 hurricane season were approved for reefing as part of a special artificial reef site (SARS) in the GOM (Kaiser and Kasprzak 2008). Furthermore, there is a higher likelihood of platforms in waters less than 200 feet deep being "reefed" artificially, given that only 40% of them in 100 to 200-foot water have been reefed so far (compared with 85% of those in 200 to 400-foot depths (Kaiser and Pulsipher 2004). Nevertheless, cases where reefing is permitted are becoming fewer given the improved ability of decommissioning contractors globally.

3 DECOMMISSIONING COST FACTORS

While many platforms have reached their end of design life, they are still being operated due to improvements in Enhanced Oil Recovery (EOR) technology, which is giving access to marginal fields. They would, however, still be due for removal at a later date. Decommissioning costs vary with the size and water depth of a platform (Kaiser and Pulsipher 2008). The decommissioning cost percentages by category have been broken down by experienced contractors (e.g., Proserv Offshore) to include: project management, engineering, and planning 5%; platform removal 29%; conductor removal 8%; site clearance cost 2; power cable removal 1%; platform preparation 2%; and well plugging and abandonment 8%. Others include pipeline decommissioning 4% weather contingency 5%, miscellaneous work provision 8%, permitting and regulatory compliance 1%, derrick barge mobilization/demobilization 15%, and material disposal 12% (Proserv 2010).

Although platform removal takes up a greater percentage of the costs, the project management team's preferred removal technique influences the overall cost of decommissioning. The item with the next highest cost percentage is derrick barge mobilization/demobilization, which takes up 15% of the total cost. The selection of a derrick barge (DB) is determined by the platform removal technique adopted. Where piecemeal removal is chosen, small DBs may be sufficient, but more cuttings and lifts would be required. Large DBs, on the other hand, can complete the job relatively quicker, because it is possible to remove the platform using a reverse-installation method with fewer lifts and cuttings. However, the overriding concern during DB selection is safety, which usually requires advance contracting of 2-3 years. Other cost factors that have to be considered include the Mobilisation of the DP2 dive support vessel (*ibid*). The type of net used for the site clearance and verification process has also been shown to increase the final decommissioning cost, with "gorilla" nets costing more (Kaiser and Martin 2009).

Although making up only 8% of the cost (Proserv 2010), well-plugging and abandonment constitute two of the most expensive activities within any decommissioning process (Parente et al. 2006). Cutting is also a variable cost item that has to be managed carefully: abrasive cutting is more popular but explosive cutting has more price certainty (Kaiser and Pulsipher 2003). There are essentially three methods of cost assessment, including the engineering method (unit cost), the statistical method (historical data), and the operator survey method (Kaiser and Pulsipher 2008: 18-19). A combination of all three methods tends to produce better estimates. However, under any estimation, due to the high uncertainty a general contingency of 15% is applied to all phases of the decommissioning process—with the exception of project management, regulatory compliance, and mobilization/demobilization of the DB (Proserv 2010). Consistent with experiences in the construction industry, there is a high incidence of cost overruns. In many cases, the difference between actual costs and estimated costs can vary from less than 10% to over 100% (Kaiser and Pulsipher 2008: 19-20). The reliability of estimates varies with the level of experience of the specialists preparing the estimates, of whom there are very few.

3 MALAYSIA'S NEED FOR A COST INDEX FOR DECOMMISSIONING

Malaysia has grown in the energy market from a net importer to a major industry player over the last couple of decades. The oil and gas sector contributes about 40% of Malaysia's total revenue, and 17% of its Gross Domestic Product (GDP) (Lintzer and Salomon 2013). Of the 300 offshore platforms in Malaysia, many of which are in shallow waters (50 m - 70 m depth), about 60% have exceeded their design life (Zawawi and Liew 2013). Although Malaysia's long experience in offshore oil and gas is appreciated by other ASEAN countries, used by Vietnam as a model in the development of its own infrastructure and regulation, Malaysia lacks specific legislation on decommissioning (Lyons 2013: 16). Moreover, because the earlier concessions did not originally include decommissioning, the job of removing oil platforms has become a liability for the government, which operates through the Petroliam Nasional (PETRONAS). The Petroleum Development Act of 1974 vests PETRONAS with "the entire ownership in, and the exclusive rights, power, liberties and privileges of exploring, winning and obtaining petroleum whether onshore or offshore of Malaysia". Furthermore, Malaysia's Public Service Commission documents further specify that PETRONAS shall have legal title to equipment and assets for petroleum operations. These two provisions make PETRONAS the sole concessionaire of petroleum resources and ownership of upstream facilities respectively. This also increases its decommissioning and residual liability.

Given the number of platforms requiring removal, it is important that PETRONAS has adequate and accurate information on the possible costs of decommissioning. It is a tedious job to develop new estimates for every one of the more than 180 platforms due for decommissioning. Therefore, a more appropriate method would be to develop a decommissioning cost index that can be updated easily when required. Although indices have been criticized as crude and highly subjective, they play important roles in highlighting relative variations in any given attribute for making systematic comparisons (Minogue 2005). This is why indices are the most favored means of showing improvements or changes over time, with indices such as the Resource Governance Index, Global Competitiveness Index etc. being adopted globally. A similar practice has been adopted by the U.S Mineral Management Services by ascertaining the cost of decommissioning at a point in time, and updating the cost every five years to reflect the impacts of market, technology, inflationary, and regulatory policy changes on costs.

Every platform is unique in design and complexity; however this uniqueness is limited to design and weight (size), while the major features remain the same. Where differences exist between platforms, they do so simply on the basis of proportion; hence, a factor can be calculated to account for proportional differences. While the estimates from the index may not be entirely accurate, they would however assist government in cost planning and determination of an appropriate "zone of possible agreement" (ZOPA), upon which to base negotiations with contractors.

It has also been found that early concessions in negotiations depended on the point at which a negotiator intends to stand within their ZOPA. A promotion-focused party gained an upper hand in negotiations if the prevention-focused party conceptualized their goals within the lower range of their ZOPA (Trötschel et al. 2013). The implication of this in negotiations is that the client needs to understand the needs of the contractor before stating their own position. However, the ZOPA of the client tends to often be lower, given the fact that they are promotion-focused, and therefore want the contract executed.

5 CONCLUSIONS

Governments with abandoned oil platforms in their territorial waters are worried about the costs of removing these structures and disposing them onshore in compliance with international conventions and marine safety requirements. Equally worrying is the inability to develop accurate cost estimates for the execution of these removals to assist in proper cost planning. Their concerns are genuine, especially against the backdrop of the huge costs involved in these endeavors. This article advocates the development of a decommissioning cost index for Malaysian waters to enhance reliable cost estimation and to assist during negotiations with contractors. Indices are very helpful tools that enable comparisons between conditions and across several variables and are easy to update once developed.

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