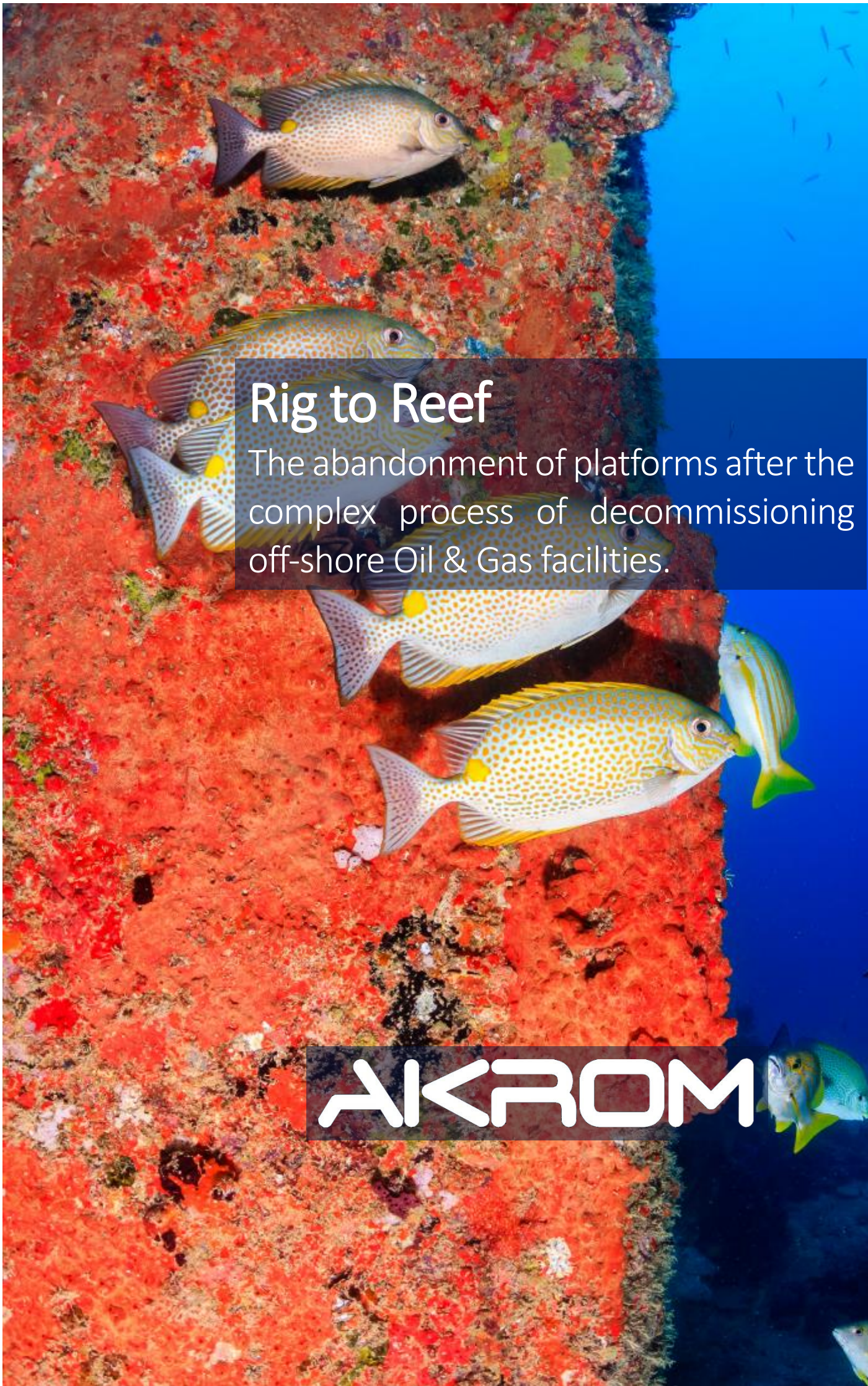

Rig to Reef

The abandonment of platforms after the complex process of decommissioning off-shore Oil & Gas facilities.

AKROM

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The Abandonment of platforms after the complex process of decommissioning off shore oil and gas facilities: Rig to reefs, a potential solution?

INTRODUCTION

There are many processes involved in the oil and gas industry activity cycle; exploration, appraisal, development, production and decommissioning. All these processes are complex and require the involvement of experts, substantial financial investment, a considerable time investment and special equipment in order to reach the final objective of exploration and extraction of oil and gas. This is followed by the obligation to remove all or part of the equipment and installations involved once the operation is complete. Of these activities, decommissioning is one of the most difficult. The process of decommissioning consists of the removal, disposal or re-use of the installations.

There are many other factors to consider carefully in order to decide the best way remove a structure. These include the environmental impact, cost, the potential public impact and the potential legal impact. Depending on the results of the analysis of those factors it may be decided to remove the whole structure, remove the structure partially or leave it in place. Deciding the method for decommissioning is a very complex issue and as mentioned before, there are many factors to be considered by experts in the field followed by evaluation of all the information and development of an integrated strategy.

It is generally assumed that the productive life of a platform is approximately 30 years. According to Zhiguo Gao, a member of the tribunal for the law of the sea,[1] by the end of the 1990s there were 6500 offshore oil and gas production installations around the world. All of them were installed in the 1960s and 1970s.[2]Once the productive life of the fields comes to an end, these installations need to be decommissioned. The report published by Oil and Gas UK, estimated that over the next 20 years 470 installations will be decommissioned.[3] It is apparent that thousands more remain to be decommissioned in following years.

The complexity of the regulations pertaining to the decommissioning process represents a legal challenge that will significantly affect the final results and costs of the process. Furthermore, the limited availability of facilities and suppliers for the volume of decommissioning activity, which is predicted to rise in the coming years, strengthens the imperative of considering alternatives other than the traditional ones.

The thesis of this paper is that rig to reef is the best option for decommissioning installations and equipment used for the extraction and exploitation of oil and gas. With the aim of demonstrating the complexity of the factors that need to be considered when making decisions in the decommissioning process, and the advantages that rig to reef programmes offers, the legal framework, the costs of decommissioning and the potential environmental impact will be considered in this document. Furthermore, some examples will be provided to illustrate the conclusions for some subtopics. The first part of this document, will analyse the legal structure of decommissioning, the second part will analyse the financial issues and the third part, the potential environmental impact. The fourth part of the thesis will identify the characteristics and advantages of using a rig to reef programme.

[1]*The author is member of the tribunal since 20 January 2008*

[2]*Zhiguo Gao; Environmental Regulation of Oil and Gas (1998)*

[3]*Ibid*

BODY

1 Legal Structure

The different regulations that rule the activities related to the energy industry should ideally work as an integrated system, complementing each other. However, in the case of oil and gas regulations, and specifically the regulations for the decommissioning activities, there are international conventions and national regulations that are sometimes in conflict, leaving the situation to the interpretation of legal experts.

The legal framework pertaining to the decommissioning of oil and gas facilities consists of international conventions and national laws. The applicable laws for decommissioning vary depending on the country and region where the installations are located and the international conventions that the country is part of. Therefore, the level of conflict can vary from case to case.

1.1 International Conventions

As Tim Martin, author of the paper "Decommissioning of International Petroleum Facilities Evolving Standards & Key Issues" explains, the potential environmental consequences produced by the decommissioning of oil and gas installation may not only affect the country where the installations are located, but also international zones such as international waters. In such cases, international conventions play a major role in regulating the activity.[4]

The main international conventions that stipulate the rules for decommissioning, which will be discussed later in this document, are the United Nation Law of the Sea Convention (UNCLOS), the Geneva Convention on the Continental Shelf, the International Maritime Organization (IMO) and the London Convention (LC).

1.1.1 United Nations Law of the Sea Convention

Article 60(3) stipulates that "Any installations or structures (in the exclusive economic zone) which are abandoned or disused shall be removed to ensure safety of navigation, taking into account any generally accepted international standards established in this regard by competent international organization. Such removal shall also have due regard to fishing, the protection of the marine environment and the rights and duties of other states. Appropriate publicity shall be given to the depth, position and dimensions of any installation or structures not entirely removed"[5].

The article outlines the main objective as the removal of the structures, the safety and protection of the marine environment and the activities that ensure these. However, it does not provide further information about how the structures and installations must be removed. It appears to be open to interpretation by the operator whether the decommissioning is partial or complete. Both options are valid under the UNCLOS.

[4] *Tim Martin, "Decommissioning of International Petroleum Facilities Evolving Standards & Key Issues" (Continuing Legal Education, University of Texas, 2010)1.*

[5] *United Nations Law of the Convention of the Sea, opened for signature 10 December 1982, 1833 U.N.T.S. 397, art 60(3) (entered into force 16 November 1994)*

1.1.2 The Geneva Convention on the Continental Shelf

Article 5 of the convention outlines the rules governing the exploration and exploitation of the continental shelf and the installations used during those processes. Article 5(5) states that "Due notice must be given of the construction of any such installations, and permanent means for giving warning of their presence must be maintained. Any installations which are abandoned or disused must be entirely removed"[6].

The article points out the necessity for the operator to inform the authorities about the installation and further dismantling of those structures, stipulating obligatory full removal. It does not provide the option of partial removal, as the UNCLOS does. The prevailing interpretation of this kind of legal overlap, where there are different levels of obligations stated for the same issue, is to abide by the most stringent obligations. This means that those countries that are members of this convention have the obligation to decommission the whole structure, regardless of whether other international agreements and national requirements are more lenient.

1.1.3 The International Maritime Organization (IMO), Guidelines 1989

Article 1 of the guidelines of the IMO (1989) stipulates some requirement for the removal of offshore installations:

"Abandoned or disused offshore installations or structures on any continental shelf or in any exclusive economic zone are required to be removed, except where non-removal or partial removal is consistent with the following guidelines and standards". It adds, "The coastal State having jurisdiction over the installation or structure should ensure that it is removed in whole or in part in conformity with these guidelines and standards once it is no longer serving the primary purpose for which it was originally designed and installed, or serving a subsequent new use, or where no other reasonable justification cited in these guidelines and standards exists for allowing the installation or structure or parts thereof to remain on the sea-bed. Such removal should be performed as soon as reasonably practicable after abandonment or permanent disuse of such installation or structure".[7]

This first part of the guidelines gives the coastal country the option to demand either complete or partial removal. However, Article 3 provides more specific rules about the removal depending on the location of the abandoned or disused installations and the weight of the structures:

"3.1 ... standing in less than 75 m of water and weighing less than 4,000 tonnes in air, excluding the deck and superstructure, should be entirely removed".

"3.2 ... emplaced on the sea-bed on or after 1 January 1998, standing in less than 100 m of water and weighing less than 4,000 tonnes in air, excluding the deck and superstructure, should be entirely removed."

These articles establish the obligation to remove the entire structure depending on the depth of the waters where they are located and the weight of the structures. Therefore, the obligation of the operator to remove the installations partially depends on those characteristics. However, Article 3(5) clarifies that point. If a structure has certain characteristics, complete removal may not be required in situations of high risk or excessive cost. "3.5 Notwithstanding the requirements of paragraphs 3.1 and 3.2, where entire

[6] *The Geneva Convention on the Continental Shelf, opened for signature 29 April 1958, 499 UNTS 311, art 5 (entered into force 10 June 194)*

[7] *International Maritime Organization (IMO), Guidelines 1989, Article 1*

removal is not technically feasible or would involve extreme cost, or an unacceptable risk to personnel or the marine environment, the coastal country may determine that it need not be entirely removed".

Even though the guidelines permit some exceptions to the requirement for complete removal, they do not allow any exception when structures are in, or close to, international routes and present a hazard to navigation;

"3.7 Installations or structures which no longer serve the primary purpose for which they were originally designed or installed and are located in approaches to, or in, straits used for international navigation or routes used for international navigation through archipelagic waters, in customary deep-draught sea lanes, or in, or immediately adjacent to, routing systems which have been adopted by the Organization should be entirely removed and should not be subject to any exceptions."

1.1.4 London Convention (LC)

The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, commonly known as the London Convention, has as its main objective the protection of the marine environment from pollution caused by the dumping of wastes and to control the disposal of waste at sea. According to this convention any waste dumping is prohibited. However, in some specific cases, national governments may approve the dumping of some wastes at sea, after having analysed the impact of that action on the environment (The London Convention and Protocol: Their role and contribution to protection of the marine environment.).

Articles IV and V of the convention outline the rules concerning the limits to dumping. Article IV states that "... In accordance with the provisions of this Convention, Contracting Parties shall prohibit the dumping of any wastes or other matter...". While this part of the convention indicates that the activity is entirely prohibited, Article V mentions a number of exceptions in which Article IV would not apply. All those exceptions are related to safety:

"The provisions of Article IV shall not apply when it is necessary to secure the safety of human life or of vessels, aircraft, platforms or other man-made structures at sea in cases of *force majeure* caused by stress of weather, or in any case which constitutes a danger to human life or a real threat to vessels, aircraft, platforms or other man-made structures at sea, if dumping appears to be the only way of averting the threat and if there is every probability that the damage consequent upon such dumping will be less than would otherwise occur...".[8]

It is apparent that there are a number of contradictions among these various international conventions. This is the case with the UNCLOS and the Geneva Convention. While the first one states that installations must be removed, leaving open the possibility to remove the structures entirely or partially, the second one states that it must be removed completely. There are many opinions about which statement must be applied by those countries that are signatories to both conventions. As mentioned before, the most widely held view is the textual approach where the more stringent requirements must be followed.[9]

[8] *The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, opened for signature 29 December 1972, 1046 UNTS 120 (entered into force 30 August 1975) ('London Convention')*

[9] *Tim Martin, "Decommissioning of International Petroleum Facilities Evolving Standards & Key Issues" (Continuing Legal Education, University of Texas, 2010).*

1.2 National Law

Each country decides which of the international conventions applying to oil and gas activities that they choose to adopt. However, when it comes to national law, many of the countries involved in oil and gas production "do not have laws and regulations in place to manage the decommissioning process; or if they do, they have not being tested in practice". [10]According to Martin, the country that has experienced the mostdecommissioning is the United States, where more than one thousand decommisions have been performed(p.7).[11]For this reason, the experience of the United States highlights this point.In the USA, the national decommissioning law states the conditions for the submission of the decommissioning plan and it also stipulatesthe right of the government to be involved where the required conditions are not fulfilled. The system is designed to guarantee safety during the decomissioning process according tointernal rules.If companies do not fulfill the requirements demanded by the national regulations then the state takes charge of the process.

In Australia, the decomissionning process takes place under the provisions of the Petroleum (Submerged Lands) Act 1967 (PSLA), the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and the Environment Protection (Sea Dumping) Act 1981 (Sea Dumping Act) and their Regulations.

1.2.1 Petroleum (Submerged Lands) -(PSLA)

Many of the activities relating to the removal, abandonment or decommissioning of structures or equipment are regulated by the PSLA. The action of abandoning pipelines, gravity anchors and well heads isalso covered by PSLA. So too is the disposal of anything originating from day-to-day activities of petroleum exploration or production.

According to Regulation 6 of the *Petroleum (Submerged Lands) (Management of Environment) Regulations 1999*, to proceed with any activity, the operator needs approval, from the relevant authority, of the environmental planincluding the decomissioning activity. The environmental plan, once submitted by the operator, is analysed and reviewed by the authority.[12]

Regulations 10 (1)(e) and 10 (2) of the *Petroleum (Submerged Lands) (Management of Safety on Offshore Facilities) Regulations 1996* state that when the operator intends to dismantle, remove or decommission a structure, he needs to obtain a written proposal for the revision of the Safety Case.[13]

Regarding the removal of the structure, section 98(3) of the PSLA states that structures and equipment that are no longer used and that will not be used in the future for their original purposes must be entirely removed.

1.2.2 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

The EPBC Act states that if a person proposes to take any action in the commonwealth marine zone, that may have a significant impact on the environment, he needs to submit a proposal to the Minister for the

[10] *Ibid 7.*
[11] *Ibid.*
[12] *Petroleum (Submerged Lands) (Management of Environment) Act* 1982 (Cth) Regulations 1999.
[13] *Ibid*

Environment. Depending on the degree of environmental impact, the Minister may decide if approvals are needed to continue with the proposed actions.[14]

1.2.3 Environment Protection Act 1981 (Sea Dumping Act)

Section 5 of the Sea Dumping Act stipulates that the disposal of wastes produced by the exploration, exploitation or any other offshore activity related to seabed mineral resources is not considered in,or covered by, this Act. However, it does specify that the disposal of vessels, aircraft and platforms is within the purview of the Act. In order to proceed with the decomissioning, the operator needs to obtain an approval from the Minister for the Environment.[15]

Based upon the above regulations, it appears that the Australian regulations, cover all the procedures and actions that may be undertaken during the process of oil and gas decomissioning . It can be said that the national regulations complement the international conventions. Furthermore, the Sea Dumping Convention implemented the 1996 Protocol to the London Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matters andArticle 210 of the United Nation Convention for the Law of the Sea (UNCLOS).

In summary, the rig to reef program,where substantial sections of submerged structures remain after decommissioning, faces substantial legal obstacles under the current legislation, especially for those countries that are signatories to conventions in which the total removal of installations is required.

2 Decommissioning Cost

Decommissioning is a complex process and represents a high cost to those responsible. For this reason, operators need to thoroughly consider all the factors involved before making a decision about the method applied for decommissioning.

Keith Mayo, head of the Offshore Decommissioning office of the UK Department of Trade and Industry (TDI), estimated the cost of decommissioning for the UK industry alone at around 10 billion pounds. However, the author Graeme Gibson mentions in his article “The decommissioning of offshore oil and gas installations: A review of Current Legislation, Financial Regimes and the opportunities for Shetland” that Mayo’s estimation is “very conservative” and that the actual cost may be closer to 20 billion pounds.[16] (2002, p.23).

The authors Altit and Igiehon suggest that, due to the complexity of the process, decommissioning is an activity that should be evaluated on a case by case basis by a team of experts to reduce the uncertainty of the costs.[17] There are many factors to consider regarding the liability of companies and countries involved, such as who is responsible, how is responsibility distributed and who bears the short term and long term responsibility for the consequences of the decommissioning activity. These factors determine both the cost and the number of decommissions that need to be undertaken.

[14] *Environment Protection and Biodiversity Conservation Act 1999*(Cth) *(‘EPBC Act’)*
[15] Environmental Protection Act 1981 (Cth)(‘Sea Dumping Act’).
[16] *Mayo K.*
[17] *Altit F. and* Igiehon M, ‘Decommissioning of Upstream Oil and Gas Facilities’ in Geoffrey Picton-Turbervill (ed), Oil & Gas: A Practical Handbook (2009), 129, 133.

According to the latest report from the United States Federal Mineral Management Service (MMS), platform removal represents 29% of the total cost for decommissioning, while the abandonment of platforms represents 8% of the total cost.[18]

As defined in the report, the availability of contractors who provide services for the removal of oil and gas installations "is very limited".[19] Regarding the same issue, the journal Decommissioning World published in 2010 described the situation in Malaysia as a "shortage of facilities" for the decommissioning process and adds that due to this shortage Malaysia is currently evaluating the possibility of adopting the rig to reef programme.[20]

3 Public Opinion

One of the main issues to consider in the process of planning how to remove the structures is the potential impact the decision will have on public opinion. For this reason, it is necessary to carefully analyse the potential consequences of decommissioning, for which experts in the field may be engaged to provide recommendations.

One of the most famous cases of decommissioning oil and gas structures is the Brent Spar case, in which both factors, environmental impact and public opinion, played important roles in reversing the decision made by the company responsible for the decommissioning. Brent Spar was a floating oil storage facility that was operated by Shell. After analysing how the oil rig was going to be decommissioned, the company decided that the best option was sea disposal, a decision that was approved by the British government. When the international organization Greenpeace became aware of the decision, there were several protests and attacks against the company around the world, arguing that the decision would have a terrible impact on the environment. Furthermore, some countries arranged meetings to discuss the decision and some of them publicly expressed their rejection of the decision. Throughout this period, the public image of Shell was seriously damaged. The company was severely criticised because the issue was considered a regional issue rather than an international matter.[21](Brent Spar, last modified 2010). By the end of the conflict, the company changed its decision and announced that the structure would not be abandoned and would be re-used for other purposes.[22]As this example illistrates, it is not sufficient to consider only the technical data but is also the public perception of the operator.

4 Rig to Reef Solution

Rig-to-reef (RTR) is an American program developed by the Minerals Management Service (MMS) of the U.S. Department of the Interior, which was put into practice in some US states. The program is currently being evaluated in other regions such as Malaysia and the North Sea. It involves the conversion of rigs, which are no longer used for oil and gas activities and are scheduled for abandonment, into artificial reefs. The main purpose of the programme is to preserve themarine life growing on, and living around, the installations.These rich populations of marine organisms develop during the oil and gas exploration and exploitation processes and are destroyed if the submerged structure is removed.

[18] *Decommissioning Cost Update for Removing Pacific OCS Region Offshore Oil and Gas Facilities (2010), conducted by Project Offshore (PN 29056-11).*

[19] *Ibid.*

[20] *Decomworld, Malaysia's decommissioning dilemma: Is 'rigs to reefs' a solution? (2010)*

[21] *Wikipedia, Brent Spar (2010)*

[22] *BBC News, Oil rig home to rare coral (1999)*

4.1 Characteristics of the Rig-to-Reef Programme

The MMS publication states that within a year of installation, "the platform provides 2-3 acres of living and feeding habitat for thousands of underwater species".[23] The main objective of the RTR programme is to maintain the same conditions for the marine species that are attached to the structure. It also contributes to local fisheriesbyproviding a habitat forcommercial species.

At the moment, there are three methods ofremoving platforms and converting them into artificial reefs:

- Tow-and-place platform
- Topple-in-place platform
- Partial removal in place platform

4.1.1 Tow-and-Place Platform

This is the most widely used method. It involves cutting the platform from the seabed and towing it to another location in order to reuse it as a reef in the new, approved destination.

4.1.2 Topple-in-Place Platform

This method requires the use of explosives to remove the top of the structure. Subsequently the remaining structure falls to the seabed where it provides a habitat for marine life.

4.1.3 Partial Removal in Place Platform

In this case, only the top part of the platform is removed. The lower part of the sructure remains in place without adversely affecting the marine community that has developed on and around it.[24]

4.2 Costs for the States and the Companies

Another part of the programme gives the companies responsible for the platform the option of donating a percentage of the cost saving (According to Raftican and Steinbach, that percentage is usually around 50%). This donation is directed to the maintenance of the artificial reef into the future. This minimises ongoing reef maintenance costs that would otherwise fall to the state.

4.3 Positive Environmental Impact

Experts from the University of California investgated the program and concluded that artificial reefs offer ideal conditions for certain marine species. In 1995, Dr. Milton Love of the Marine Science Institute, University of California at Santa Barbara conducted a study on platforms in California, observing and surveying the fish population around 13 platforms over 10 years. The results showed that fish numbers increased over the study period.[25]He highlighted, in particular, the increase in the population of some rock fishes including *sebastes* which had recently been declared an overfished species. Considering these data

[23] *Bureau of Ocean Energy Management, Regulation and Enforcement, Artificial Reefs: Oases for Marine Life in the Gulf (2010)*

[24] *Dauterive, L. 'Rigs-To-Reef Policy, Progress, and Perspective' (2000) U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS.*

[25] *Raftican Tom and Steinbach, 'Decommissioning California's Offshore Platforms: Rigs to Reefs in Politically Hot Waters' ("Offshore Development New Frontiers of Opportunity" CoastNet conference, London 15 Sep 2005).*

and survey results, it is apparent that keeping rigs in the sea as artificial reefs may contribute to the fishing industry and environmental diversity.

In 2001, the research firm of Fairbank, Maslin, Maullin & Associates conducted a survey to determined the level of public acceptance in the areas where RTR was put into practice. The results showed that around 70% of the population supported the program. Support was even greater in coastal populations.

CONCLUSION

The complexity and characteristics of the decommissioning process require thorough evaluation on a case by case basis, in order to determine the best decomissioning solution for each particular plarform. The adption of the RTR program may represent an opportunity for all stakeholders affected by the removal of oil and gas structures. By adopting the program, companies would not have to deal with the responsibility and high costs of abandoning the platforms.

Based on the experience of the regions that have adopted the program and the opinion of environmental experts, the RTR program has a positive impact on the environment. The elimination of destructive methods such as the use of explosives for the process reduces the negative environmental impact. One of the objectives of the program is to protect marine life. Studies indicate that this is happening succesfully.

The results show that the public has a positive view of the program. This acceptance is expected to continue to increase as RTR is adopted by more and more countries around the world. This is particularly true for populations located close to the artificial reefs.

In the case of Australia, the conditions stipulated by the current legislation may present a challenge for the companies considering adopting the rig to reef program as a decomissioning solution. A significant number of platforms are approaching obsolescence within the next few years or decades. Discussions around new decomissioning solutions have commenced. These include the legal framework required to cover alternative solutions. The Rig to Reef program has been succesfully adopted by several countries and seems to be a potential solution for the future of the Southeast region as well.