

Debottlenecking The Complexities of Stakeholder Management in Indonesia Offshore Platform Decommissioning

Desi Aresa Mahdi, Gatot Yudoko, and Agung Wicaksono

ABSTRACT

Indonesia's Offshore platform decommissioning is a complex activity involving lots of stakeholders with different interest and power. To date only one (1) platform that has been removed from its origin place offshore and sank as rig-to-reef near Kalimantan, Indonesia. The whole business process took 7 (seven) years from the first discussion in 2017 until the execution in 2022, which is not desirable for future decommissioning projects. This research collected data from the key stakeholders including the Production Sharing Contract (PSC) Contractor and several institutions involved in the project to examine the complexities of stakeholder alignment as study case for future decommissioning project. The qualitative analysis utilizes Current Reality Tree to find the root cause and Future Reality Tree to identify required injection to improve the stakeholder alignment. The results show three main challenges: unavailability of Abandonment and Site Restoration (ASR) Fund, decision of end-of-state of the facilities, and process approval for Asset Write-Off. The root causes are weak implementation of existing decommissioning regulations and lack of understanding of stakeholder's needs. Injection into the future reality tree include formalizing funding mechanism for the PSC with no ASR fund, introduction of umbrella regulation to cover different business process in different ministries and establishment of ASR strategy by taking into account the PSC organizational capability.

Keywords: Current reality tree, future reality tree, offshore decommissioning, stakeholder analysis.

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I. INTRODUCTION

Abandonment and Site Restoration (ASR), which is often referred to as Post Operation Activity (POA) or decommissioning, is a restoration process used following oil and gas mining activities. According to the regulation of Upstream Oil and Gas Taskforce (SKK Migas) PTK No. 040/2018, ASR includes permanent well closure, termination of operation, elimination of production and supporting facility's ability to be operated again, permanent demolition, and carrying out environmental restoration. It is often considered unattractive to upstream oil and gas operators because of the considerable risk involved and the fact that it does not add production and revenue to the business.

Based on the road map of Offshore Platform Decommissioning initiated by SKK Migas in 2021, there are a total of 100 offshore platforms to be decommissioned within the next 7 years and 10 platforms in the first year. Unfortunately, only 17% of these platforms have ASR funds because the old Production Sharing Contracts (PSC) prior to 1994 did not mandate the operator to set aside ASR funds.

The first offshore platform removal under the decommissioning program was successfully completed in November 2022 and was funded by a grant loan from the South Korean government, as the current PSC has no ASR fund that they were handed the operatorship from a previous

foreign PSC, which was part of the old PSC Contract. The scope for dismantling includes cutting and removal of 4 conductors, the riser, and the three-legged jacket and deck. The parts were transported to a conservation area near Bontang, East Kalimantan, and sank onto the seabed for rig-to-reef. The whole process took 7 (seven) years from the initial discussion by the first operator in 2015 until execution in 2022. The decommissioning business process is enclosed in Fig. 1, showing the different roles of stakeholders.

The research is conducted based on stakeholder management experience on the Decommissioning Pilot Project to answer the following questions:

- Who are the key stakeholders?
- What are the challenges that created bottlenecks in getting stakeholders' alignment?
- What are the root causes of these challenges?
- What is the ideal duration for getting stakeholders' alignments and approvals for the decommissioning plan and permit?

The objective of the research is to provide analysis for future decommissioning projects, to identify the root cause of the challenges, and to recommend an action plan to reduce timeline duration for stakeholder alignment to approve POA and relevant permits.

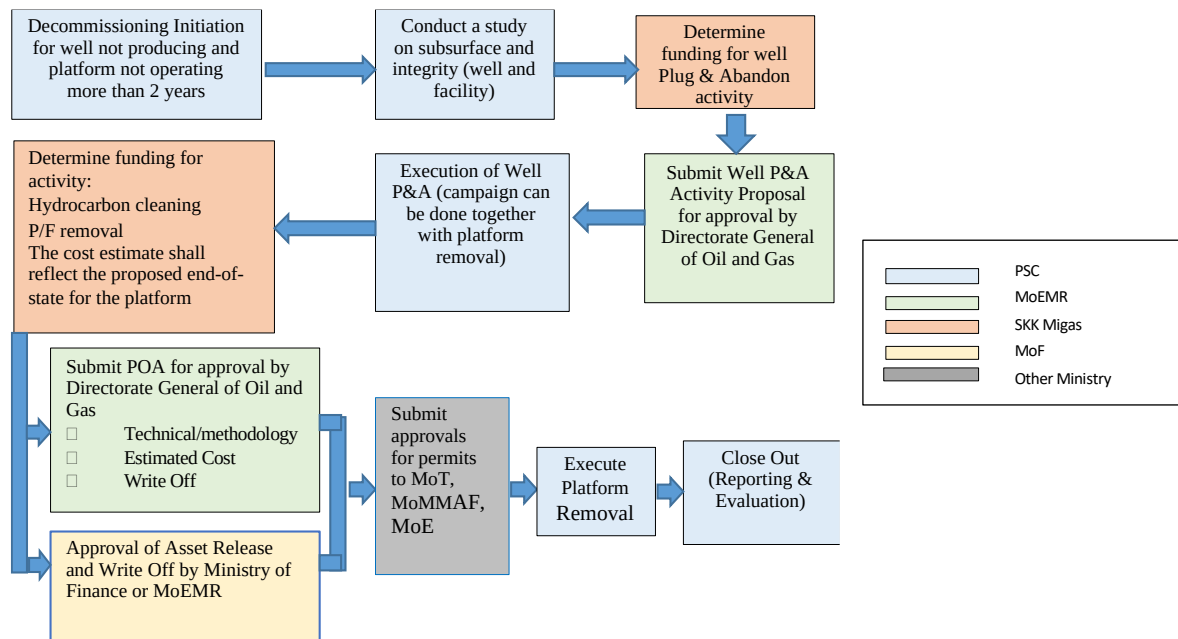


Fig. 1. Offshore platform decommissioning business process.
Source: SKK Migas.

II. BUSINESS ENVIRONMENT REVIEW

The obligation to remove any installation or structures in offshore areas has been stated in several regulations as follows:

1. *Presidential Regulation No. 17/1994 Chapter 21* on Monitoring Implementation of Oil and Gas Exploration and Exploitation Activities in Offshore Areas stated that any exploitation facilities that are no longer being used have to be fully dismantled within the period governed by Director General (of Oil and Gas), by taking appropriate measures to ensure job safety and shipping lanes.
2. *UNCLOS 1982*, which has been ratified by UU No. 17/1985: Article 60 (3) states that any installations or structures abandoned or disused shall be removed as necessary to ensure the safety of navigation, taking account of any generally accepted international standards established by the International Maritime Organization or IMO.
3. *UU No 17/2008 Chapter 195 (C)* stated that every building or installation referred to in letter b, which is no longer in use, must be demolished by the owner of the building or installation
4. *Minister of Energy and Mineral Resources (MoEMR) Regulation No. 15/2018* about Post Operation Activity (POA) on Upstream Oil and Gas Industry in Indonesia.
5. *PTK SKK Migas No. 040/PTK/XI/2018 Rev.01* about Abandonment and Site Restoration (ASR)
6. For any construction /relocation/removal of offshore installation, get approvals from *Transportation Ministerial Regulation No. 129/206 Chapter 60 (3)*.

Other regulations governing the budget allocation for decommissioning activities are as follows:

1. *UU No 17/2008 Chapter 195 (e)* stated that the owner or operator who will construct the building or installation, as referred to in letter "c," is required to provide a guarantee. The term "providing guarantees" means the obligation for the owner or operator to have an insurance guarantee or place a sum of money as collateral to replace the cost of

demolishing a building or installation that is no longer used by the owner or operator.

2. According to *Chapter 36 of Presidential Regulation No. 35/2004* on Upstream Oil and Gas Activities, the Operator of PSC is obligated to set aside the ASR budget for post-operation activities since the commencement of the exploration phase and is executed using the WP&B mechanism.
3. *Minister of Finance Regulation no 140/PMK06/2020* on Upstream Oil and Gas State Property Management, which governs the process for state asset write-off, which is needed prior to decommissioning.

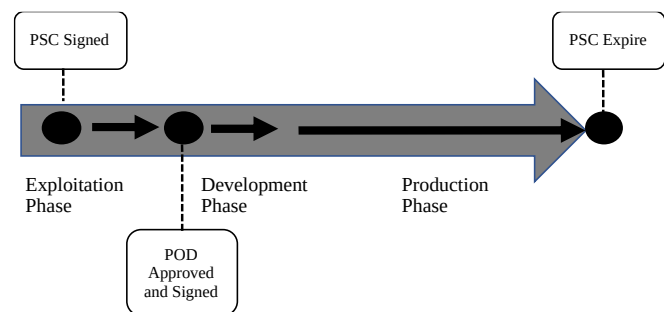


Fig. 2. PSC period.
Source: Pudyantoro (2014).

III. LITERATURE REVIEW

A. Principles of Production Sharing Contracts

Production Sharing Contract for Oil and Gas in Indonesia is a business agreement between the Government of Indonesia and the Contractor (Investor) over a certain working area with the concept of production sharing. The PSC Contractor has the obligation to provide the required technology and expertise for oil and gas production and operations, bear the risk of carrying out oil and gas production and operation, and provide the funds for exploration and operational activity. PSC for a working area commonly has a validity of 30 years, allowing the contractor to conduct

exploration (finding oil and gas reserves) and exploitation (production of oil and gas). When PSC Contractor found promising reserves, they submitted a Plan of Development (POD) to GoI to propose the field development phase and field operation phase. Decommissioning of the production facilities happens at the end of the PSC life.

In accordance with Regulation of the Minister of Energy and Mineral Resources No. 12 of 2020 concerning the third amendment to the Regulation of the Minister of Energy and Mineral Resources No. 8 of 2017 concerning gross split profit-sharing contracts, below is the definition and differences of the two schemes:

- The Gross Split Scheme is a profit-sharing calculation scheme for the management of oil and gas working areas between the government and oil gas contractors. The split of production is calculated before income tax and any feed, and the operating costs are fully the responsibility of the contractor.
- Cost Recovery Scheme is a return on operating costs that have been incurred by oil and gas contractors as long as reserves have not been found until they are commercially produced. Profit sharing or new split is divided after the First Tranche Petroleum (FTP) deducted revenue, income tax, and fees are returned.

B. Principles of Oil and Gas Asset Ownership

In line with the 1945 Constitution, Indonesia adheres to the notion of state property in the management of oil and gas natural resources. Thus, projects and facilities for the exploitation of oil and gas natural resources are owned by the Government. In another way, the government, as the owner of the oil and gas resources, is also the owner of the production facilities. PSC Contractor does not own the offshore platform, pipeline, or any equipment to exploit oil and gas, and therefore, any activities related to exploration and exploitation need to get government approvals. As the offshore platform and associated facilities are not owned by the PSC, they need to get government approvals for the Post Operation Activity, in particular, plan for facilities at the end of the PSC Contract.

According to MoF Regulation No 140/PMK.06/2020 on Upstream Oil and Gas State Property Management verse 41, when the PSC Contract is nearing expiry, the Contractor hands over the facilities to the government for:

- Handing over to the new PSC Contractor, taking over from the existing PSC Contractor.
- Recommendation for transfer of facilities usage status to other government institutions.
- Recommendation for facilities submission to Directorate General State Asset or Direktorat Jenderal Kekayaan Negara (DJKN).

According to the same regulation, the end-of-state for state asset that still has economic value can be sold via bidding or given as a grant for the non-commercial institution. If DJKN decides that the offshore facilities do not have future economic value, then they can be demolished, and the approvals for the asset written off are done by Pusat Pengelolaan Barang Milik Negara (PPBMN) under MoEMR.

C. Stakeholder Management

Stakeholders are defined as individuals or groups who are impacted by or can impact, the work or its outcomes (Walker

et al., 2008). Because of this, the success of a project is largely dependent upon stakeholder alignment with the goal/objective of the project. According to the literature (Jiang & Klein, 1999; Lemon *et al.*, 2002; Meredith & Mantel, 2000; Sauer, 1993), failure is strongly related to a stakeholder's perceptions of project value and their relationship with the project team.

Stakeholder management literally assists project managers with selecting strategies to maximize the value of a project for its stakeholders (Cleland, 1999). Stakeholder management is dealing with making stakeholders satisfied by engaging them to fulfill their interests (Bowie & Werhane, 2004; Post *et al.*, 2002).

Prior to engaging the stakeholders, project stakeholders should be identified and recognized in order to effectively manage them (Eskeroed *et al.*, 2015). Understanding every stakeholder's interest from the perspective of a bigger and integrated picture of the project is key to getting a smooth approval process (Freeman, 1984). Literature indicates that a stakeholder matrix to classify and characterize stakeholders based on their power and interest is still relevant in current research on Stakeholder Analysis as applied to complex projects (Aaltonen *et al.*, 2008, 2015). Categorization of the stakeholder will help the company to create an effective strategy for stakeholder engagement.

Finally, stakeholder engagement activities include creating strategy, communicating, involving, and improving relationships with the stakeholders (Chinyio & Akintoye, 2008; Greenwood, 2007). This starts before or when the project starts and continues throughout the project (Project Management Institute, 2017).

D. Conceptual Framework

Resolving the complexities and challenges in managing stakeholders of the Offshore Platform Decommissioning Project can be explained using the concept of debottlenecking. Debottleneck is a method of locating and resolving bottlenecks in a system or process in order to improve its efficiency and capacity. A bottleneck occurs when the flow of materials, information, or resources is restricted, resulting in delays, inefficiencies, and increased costs. The goal of debottleneck is to increase the system's throughput and decrease the cycle time so that it can meet demand and operate more efficiently.

Debottlenecking is typically a two-step process: (1) identifying the bottleneck by identifying the rate-limiting steps among resources and activities/processes in the facility, and (2) alleviating the bottleneck by making changes to those rate-limiting steps to improve the process. As each of the stakeholders brings their own view to the table when approving the decommissioning proposal and permit (as shown in Table I), it needs a root cause analysis to be able to debottleneck the process.

Following the concept of Organisation Change (PMBOK Ed. 6, 2017), where a project drive change in an organization to achieve a target business objective, the same concept can be applied to Debottlenecking. Through debottlenecking, we aim to bring the current state of the situation to the desired future state situation, which should have better business value to the organization.

TABLE I: TYPICAL LIST OF PERMITS FOR OFFSHORE DECOMMISSIONING

Permit	Ministry/Institution
Approval for well P&A and platform decommissioning	Directorate General of Oil and Gas – Ministry of Energy and Mineral Resources (MoEMR)
Approval for channel dredging and dumping permit	Directorate General of Sea Transportation – Ministry of Transportation (MoT)
Approval for a sailing permit	Port Authority
Approval for WP&B and AFE and Bid Plan for ASR	SK Migas
Environmental permit for conversion of the platform to rig-to-reef	Ministry of Environment
Write-off Asset	Directorate General of State Asset – Ministry of Finance (MoF)
Permit/Approval for Platform Removal Activity	Directorate General of Sea Transportation – Ministry of Transportation (MoT)

1) Current State

The current state shows a lengthy time to align all stakeholders to approve the proposal of the decommissioning project, which is undesirable as it is not a revenue-generating project, and it creates a backlog for future offshore decommissioning projects. For the PSC, this lengthy time erodes the value of the project and potentially disrupts the business, as resources are tied up longer for this project.

2) Future State

The desired future state is a condition where there is a reasonable amount of time for all stakeholders to develop alignment and thus approve the decommissioning plan proposal in due course. The expected total duration for all business processes is gauged from the respondents.

3) Debottlenecking Process

a) Identification of Bottlenecks (Current Tree Analysis)

Identification of bottlenecks is done using an exploration of the current state process to find underlying causes of undesirable effects (UDE). Once we identify the UDEs, we will find what is causing these UDEs, and these are called intermediate effects (IE). We will continue branching down to find the cause of the IE until we find the root causes. A Current Reality Tree (CRT) will be used as a tool to systematically diagram the problem and help find the root cause. The Current Reality Tree (CRT) is a tool for discovering the system's core driver and known as the constraint as discussed in the Theory of Constraints (Goldratt, 2016). A constraint is a cause that is most common to the most severe symptoms the system experiences, and thus, the constraint must be carefully managed to improve throughput.

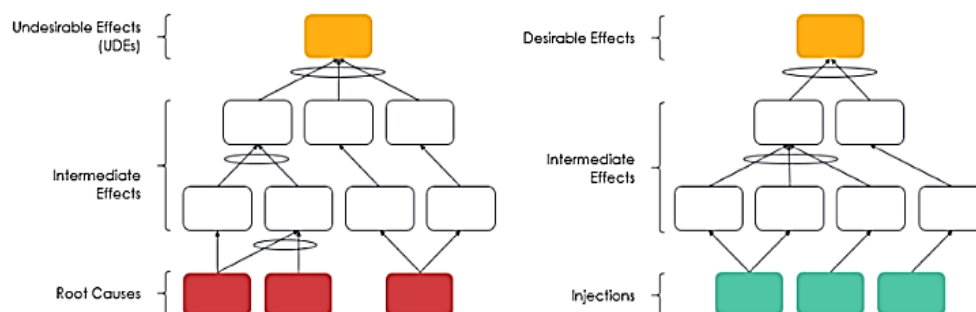


Fig. 4. Current reality tree (left) and future reality tree (right).

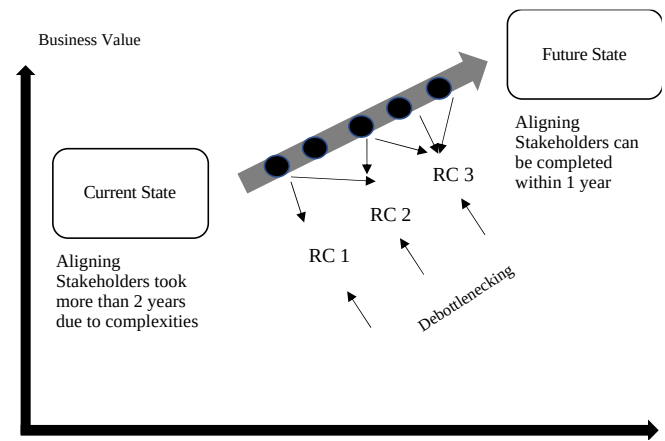


Fig. 3. Conceptual framework.

b) Alleviate the Bottlenecks (Future Reality Tree Analysis)

Once the root cause of the problem is identified, debottlenecking is done by recommending a set of action plans. The method used is a Future Reality Tree (FRT). An FRT is a logical structure that enables a person to construct a solution that, when implemented, eliminates the existing undesirable Effects (UDEs) by Desired Effects (DEs) without creating devastating new ones. In other words, an FRT presents a sequence of cause-and-effect relationships that links proposed injection(s) to desired effects (DEs). The structure of FRT is similar to the Current Reality Tree (CRT) but differs from the latter by proposing actions, policies, and behavioral changes “injected” into the current state (or reality) to lead to the future state. The proposed action plan (injections) will be allocated to the respective stakeholders based on analysis of the roles, power, and influence.

IV. RESEARCH METHOD

The research prefers to use qualitative analysis since it can give a fuller knowledge of the intricate social, environmental, and contextual aspects at play. Qualitative research can assist in identifying significant players, their motives, and their opinions of the decommissioning process by using techniques including interviews and observations. One of the benefits of qualitative research is its adaptability to the specific needs of the research project which allows researchers to modify their approach based on the needs of the research project (Creswell, 2013).

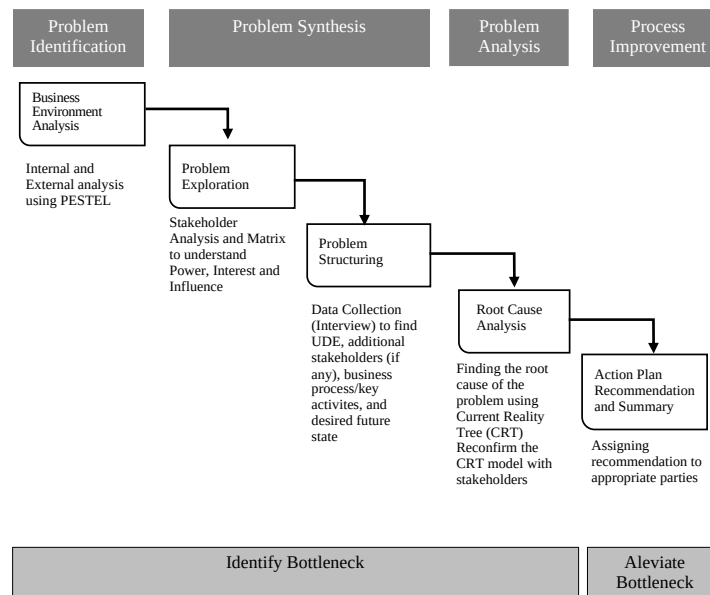


Fig. 5. Research method.



Fig. 6. Rich Picture Offshore Decommissioning Project.

V. RESULTS AND DISCUSSION

The interview was conducted with 7 respondents from internal and external /other ministries who are in senior positions and were directly involved in the Pilot Project. The interview managed to collect stakeholders' views regarding stakeholder's role (power, interest, and influence) and their relationship in the approvals of the Decommissioning Plan, the UDE and the potential cause of the UDE, the desired decommissioning approval process, and duration, and their view on Regulation around Offshore Platform Decommissioning. The rich picture in Fig. 6 shows

stakeholder relationships during approvals of the Pilot Project.

Based on the interview results, a mapping of Power vs. Interest in the form of a Stakeholder Matrix is drawn, as shown in Fig. 7. Ministry of Energy and Mineral Resources.

(MoEMR), SKK Migas and the Ministry of Transportation (MoT) are the ones in Quadrant 1 (Monitor Closely) as they are the ones that hold the highest power, influence, and interest in the overall decommissioning process. It is interesting to note that the Ministry of Finance (MoF), which also plays a significant role in approving asset write-offs, is deemed by almost every stakeholder as one that does not have

a high interest in this decommissioning project.

The respondent view of the Offshore Decommissioning Progress confirms that it is slow and very slow, signaling there are improvements that can be made on the overall business process and stakeholder alignment (see Table II).

Regarding decommissioning business process approval duration, most respondents stated it could be done within 12 months and in parallel starting when the project enters Front End Engineering Design (FEED stage). Overall, the total duration from the start of the project until site mobilization is estimated to be within 18 months, as shown in Fig. 8.

TABLE II: RESPONDENT'S VIEW ON DECOMMISSIONING PROGRESS

Response	% of Respondent
It is progressing relatively well	0%
It is a slow progress, but the business process is working	43%
It is very slow and not going to catch up with the remaining offshore platform to be decommissioned	57%

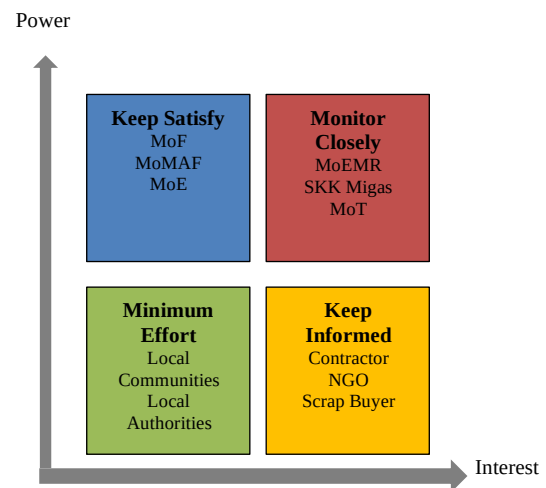


Fig. 7. Stakeholder matrix.

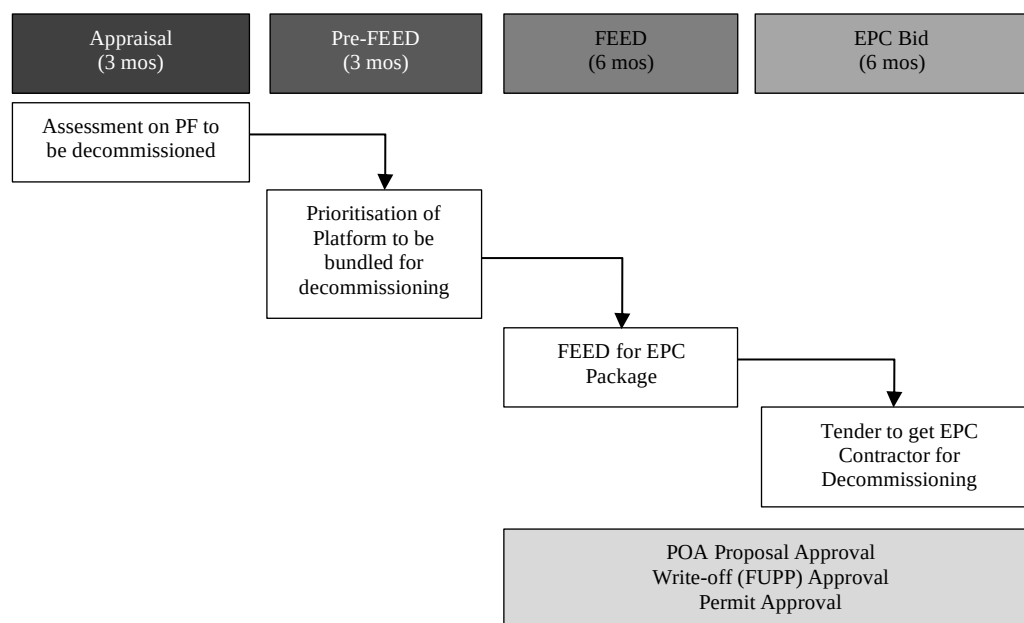


Fig. 8. Decommissioning project timeline.

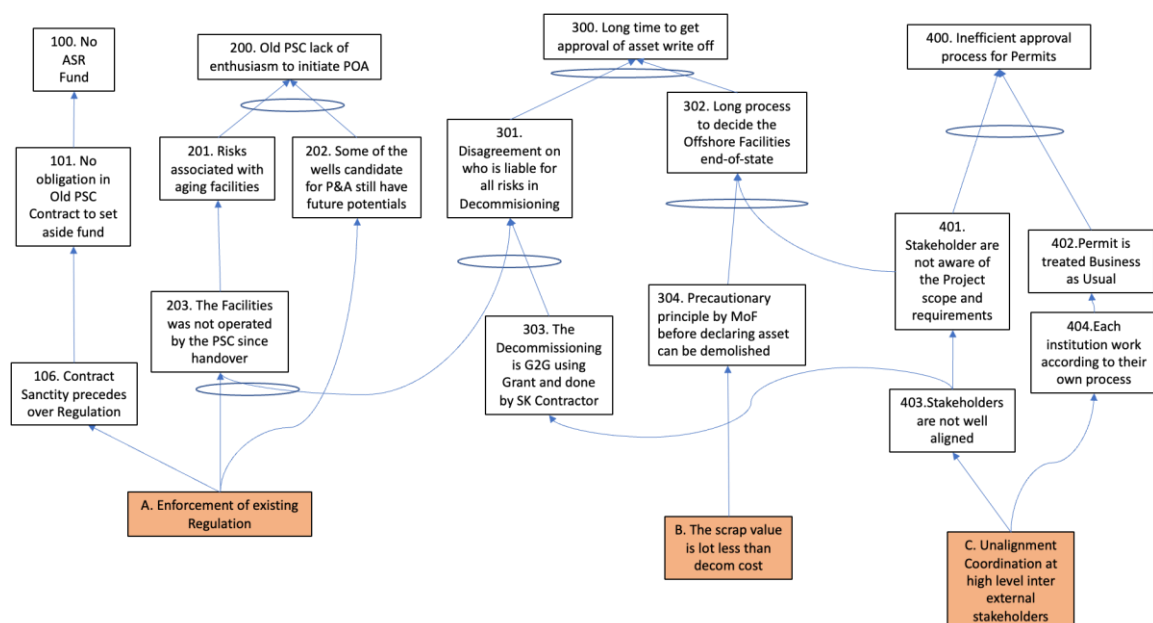


Fig. 9. Current reality tree.

TABLE III: ISSUES SPECIFIC TO THE PILOT PROJECT

No.	Issues specific to the Attaka Pilot Project	Remarks
1.	Clarity around who is responsible for decommissioning assets due to PHKT receiving the facilities from Chevron in the non-operational stage (not generating revenue for PHKT).	This issue may emerge for PSC, who take over the facilities from the previous operator who has no ASR fund. However, if the PSC is still the one that built the facility (such as the West Seno Floating Production Unit), this issue is not relevant.
2.	No ASR Fund – Gross Split (GS) Contract If there were no grants from South Korea, PHKT and SKK Migas would need to come to an agreement on how to fund this decommissioning project.	- This issue is valid for GS PSC, who took over the facilities from the previous operator without ASR Funds. - This issue is also valid for PSC under GS Contract, which was previously under Cost Recovery Contract such as PHE WJ. - Other PSCs who have no ASR Funds may be under a Cost Recovery Contract and, therefore, may propose that the POA is pay-as-you-go and eligible for Cost Recovery.
3.	Disagreement on Full Risk Liability (Surat Pernyataan Tanggung Jawab Mutlak) to be borne by PHKT. The SPTJM is part of the write-off approval pre-requisite by MoEMR.	This issue arises because PHKT was not the party who executed the POA, as it is a G2G arrangement, and the contractor (KHAN) from South Korea is not reporting to PHKT.
4.	Permit approval, in particular, the permit for utilisation of foreign vessels is treated as Business as Usual, which adds back and forth process and duration, even though the Attaka Decommissioning is the Pilot Project using Foreign Grant and ideally should be processed differently.	Future decommissioning projects that are not funded by foreign grants should follow normal procedures like any other offshore project and prioritize the utilisation of local vessels. However, due to the limited availability of Indonesian-flagged vessels to carry out the decommissioning scope safely and efficiently, this may prolong the approval process of permits for foreign vessels.

Based on the data collected from the respondents, there are several Undesirable Effects (UDE) that are currently felt. Upon review, these UDEs can be grouped into four main themes as follows:

- No ASR funds;
- PSC lack of enthusiasm to initiate POA;
- It takes a long time to get approvals for asset write-offs;
- The inefficient approval process for the permits.

These four UDEs are branched out downward to find intermediate effects and if they are related to one another. Finally, the branch will be exhausted until it gets to the root cause of the problem.

The Current Reality Tree is enclosed in Fig. 9. From the CRT analysis, the identified root causes of the UDEs are (1) enforcement of existing regulations, (2) the scrap value is a lot less than the decommissioning cost, and (3) unalignment coordination of high-level external stakeholders.

However, there are several intermediate causes (IE) identified that become specific issues to the Pilot Project and, therefore, may not be applicable to future decommissioning projects, as shown in Table III.

The desirable situation based on interview results is that the Decommissioning Business Process can be received within 12 months. An upward branching to form FRT is done to achieve this desirable effect whilst addressing the intermediate effect identified in the CRT.

Based on the Future Reality Tree shown in Fig. 10, the following “injection” or action plan is proposed to alleviate the bottleneck:

- MoEMR and SKK Migas to formalize funding mechanisms to support both Cost Recovery and Gross Split PSC (IE 404 and IE 405), which will influence and drive commitment from PSC.
- MoF to establish Write-Off regulation specific for offshore platform eligibility as demolished items such as wells and subsurface assets, due to its resell value being very low compared to the decommissioning cost. This new regulation can provide assurance to MoF in making quicker decisions for asset write-offs.
- MoF to establish regulation to address in-situ facilities

appraisal, auction, and handover to reduce offshore platform removal cost (IE 407) and attract steel fabricator/smelter/scrap buyer (IE 410), which will make quicker approval of asset write-off (IE 402).

- MoEMR to issue decommissioning umbrella guidelines that clearly describe the integrated business process from different institutions and the target duration of completion. The document shall also detail the roles and responsibilities of each institution (IE 408) to facilitate quicker approvals (IE 403).
- PSC to conduct a periodic stakeholder analysis to ensure all stakeholders are known, and risks understood.
- PSC to establish a Communication Plan for each stakeholder, including the message, the PIC, and his/her authority level. The communication plan needs to be aligned with the updated stakeholder register and matrix. Both action plans e) and f) are to ensure alignment among Stakeholders, in particular for scope, cost, and timeline, and in the end, will make a quicker and seamless approval process for the permit and license application.

VI. CONCLUSION AND RECOMMENDATION

The bottleneck in the Offshore Platform Decommissioning is shown by the time taken for stakeholder alignment on agreeing with funding, end-of-state/future usage for the platform, and asset write-off. In the study case, the duration is more than 2 years, and this can hinder the progress of decommissioning 100 platforms within the next 7 years.

The key challenges (UDE) in Offshore Platform Decommissioning that create the bottleneck in the whole process, namely: no ASR Fund, PSC lack of enthusiasm to initiate POA, long time to get approvals for asset write-off, and inefficient approval process for the permits.

Using the stakeholder management theory, this research managed to draw the relationship map of the key stakeholders in the overall offshore decommissioning process and to prioritize the stakeholder importance to the PSC Operator

based on their power and interest in the future development of stakeholder engagement strategy. One important thing that jumps out from the stakeholder analysis is that the Ministry of Finance has low to medium interest in offshore platform decommissioning whilst they hold high power in approval of asset write-off, which is mandatory for decommissioning any state's own asset.

Other ministries such as MoT and MoE play an important role in approving permits related to the physical work execution and learning from the Pilot Project needs early and active engagement to ensure they are aligned on the project objectives and timeline. Failure to understand their needs and interests results in a longer period of approvals, which potentially can increase costs as it is tying up resources longer than planned.

The root cause of the challenges in offshore decommissioning approvals are:

- Enforcement of existing regulation there is a gap in enforcing the responsibility of decommissioning obligation to the old contractor and providing a way out for Old PSC Contractor that has no ASR fund, especially gross split PSC who gets handed over the facilities from the previous contractor.
- The scrap value of the facilities is a lot less than the decommissioning cost. The decision of future usage of the platform (end-of-state) is critical to the decision-making of asset write-off.
- Unalignment coordination at a high level between external stakeholders. SKK Migas is the responsible and accountable party to help align all external stakeholders.

The optimum timeline (future desired state) for approval of the decommissioning project is 12 months, including preparation of the proposal, alignment of the stakeholders, and the approval time within each ministry/institution. Analysis using Future Reality Tree identifies several injections (action plan) to debottleneck the stakeholder

management complexities from internal and external stakeholders.

a) *Internal Stakeholder (PSC Operator)*

- Conduct periodic stakeholder analysis to ensure all stakeholders are known and risks associated with the stakeholder that can impact project scope, cost, and schedule are understood.
- Establish a communication plan for each of the stakeholders, including the specific message to be conveyed and the PIC from the PSC side.

b) *External Stakeholder*

- Formalize a funding mechanism for Old PSC that has no ASR Fund, specifically for Gross Split (GS) PSC.
- Establish a Write-Off Regulation specific for offshore platform decommissioning, which can be treated as demolished assets like wells and subsurface. This will empower MoF in making earlier decisions and approval for offshore platform write-offs.
- Establish regulations to address in-site facilities appraisal and auction. This is intended to attract more third parties to remove the platform from the site directly, which means less decommissioning cost for the PSC.
- Issue decommissioning umbrella guideline that serves as a reference for interface with different institution/ministry business process.

The research results provide a full picture of current stakeholder management complexities, which is beneficial for other PSC contractors to learn from and be ready for their decommissioning projects. One of the takeaways is that the *identification and monitoring of stakeholder interest, influence, and power shall be done early and regularly* to allow the development of an appropriate communication plan and engagement strategy.

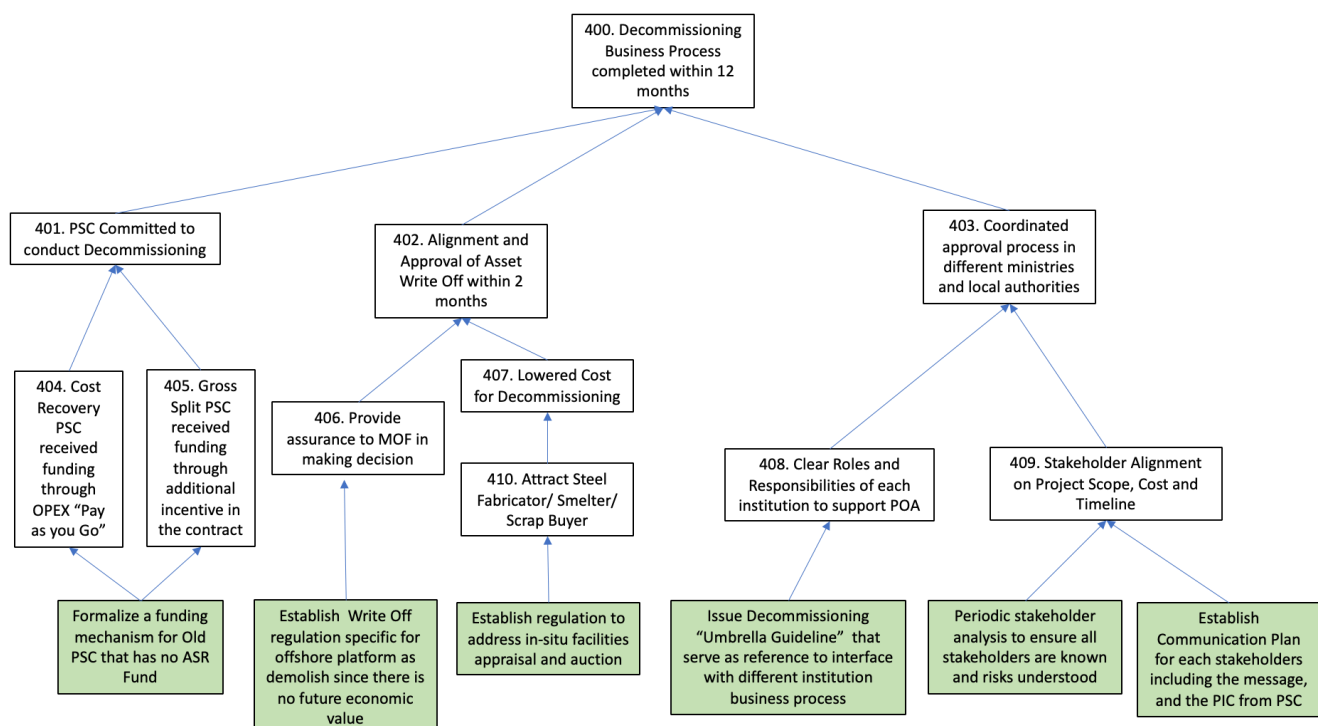


Fig. 10. Future reality tree.

As POA is a non-revenue generation activity, cost efficiency *needs to be the second highest priority for the PSC Contractor after the safety of execution*. This can be done by combining well conductor removal together with the platform/jacket in one offshore campaign. Another option to consider is prioritizing and grouping several wells and offshore platforms to be decommissioned into one EPC Package, which will reduce overhead and mob/demob vessel costs. The PSC Contractor that owns several aging facilities also needs to realize that decommissioning has been addressed in regulation, so regardless of the difference of law interpretation, they are better to *allocate fit-for-purpose resources team to manage the ASR inventories and put together an integrated decommissioning strategy to manage the ASR inventories*.

As funding will still become an issue for PSC that has no ASR funds, especially for Gross Split (GS) PSC, it is suggested that GoI consider *providing additional incentives in the GS contract to cover the Decommissioning cost* (if it

has not been covered in the contract).

The first limitation of the research is it does not include onshore facilities decommissioning as these facilities have different designs and thus different options for decommissioning methods and different required permit approvals.

The second limitation is this research does not dwell on the details of each regulation concerning offshore platform decommissioning. However, the author has reviewed specific regulations that address the challenges brought up by respondents MoF regulation about asset write-off (FUPP).

Future research can use this research as a reference to measure the duration of the next offshore decommissioning project approval process to see if it falls within 12 months as desired and look in more detail at specific issues internal the PSC during the appraisal and conceptual stage, which did not emerge during Pilot Project since this project was done by South Korean government using grant fund.

APPENDIX

TABLE IV: STAKEHOLDER ANALYSIS OF OFFSHORE DECOMMISSIONING PILOT PROJECT

Stakeholders	Interest	Influence	Power
Directorate General of Oil and Gas – Ministry of Energy and Mineral Resources (MoEMR)	Medium – High Assess the status of the platform, wells, and pipeline and approve the facilities to be decommissioned.	High Their role plays a major influence in the whole decision-making of Offshore Platform proposal approval.	High If no approval is received, then the platform can not be decommissioned.
Coordinating Ministry of Maritime and Investment Affairs (Cord. MoMIA)	High Coordinating decommissioning activities and facilitating bilateral relationships with the Korean Government on Grant Funds.	High The whole deal depends on the relationship between Indonesia and Korea sponsored by this Ministry.	Medium Specific to the Pilot Project, they act as a deal maker and deal breaker with the South Korean Government, but they are not necessary for other decommissioning projects.
Directorate General of State Asset – Ministry of Finance (MoF)	Low Their interest is to align with GoI Regulation that the facilities have no more economic value and thus can be written off from the State Asset list.	Low They are not interested and, therefore, do not actively influence parties in making decisions about the approvals.	High Their approval for asset write-off is mandatory to be obtained and thus has the potential to be a show stopper.
Ministry of Marine Affairs and Fisheries (MoMAF)	Low – Medium Assess the proposed location for the decommissioned platform. Either left in the site or cut and moved to a new location.	Medium Their agreement is on the method of platform removal (for rig-to-reef), and the location is interfaced with other institutions such as MoE and MoT.	Medium – High Although they are not the ones who approve the decommissioning proposal, their endorsement of the location is required by the Directorate General of Oil and Gas.
SKK Migas	High Approve the use of ASR funds, overall work program, and Bid Plan.	Medium They play a facilitating function for different ministries and institutions on behalf of the operator.	Medium-High They are not the decision maker on the system, but their recommendation is crucial for MoEMR's final approval.
Directorate General of Sea Transportation – Ministry of Transportation (MoT)	Medium As long as the proposal from the PSC Contractor is supported with complete paperwork, they are willing to approve.	Low – Medium The interface can influence other institutions, such as MoMAF for location decisions to sink the platform.	High Delays in the permit approvals, such as a permit for bringing the vessel to the location, a permit for dumping/sinking in the new location, and a permit for removal, will impact the project schedule and cost.
Ministry of Environment	Medium As long as the Joint Project Team prepared and submitted AMDAL and/or RKL/RPL as per regulation requirements, MoE will provide the approval.	High No mobilization to the site and physical work at sea shall start prior to approvals of the Environmental permit from MoE.	Medium Delays in the permit approval will not stop the project but may impact the project schedule.
PSC Contractor/Operator	Low Related to the absence of ASR Fund	Low – Medium They are the ones that propose to Dir. Gen O&G, if the platforms are ready to be decommissioned, however, they do not have influence over the approval of the proposal.	Low They do not have the power and final say in the whole process.
South Korean Government	High SK Government has a high interest in this project, as it serves as a showcase of their industry capabilities and experience for platform services.	Low SK Government did not interface directly with Indonesian government Institutions but through the Joint Committee and SK MoMAF.	Low No specific approvals are required from SK Government for the Decommissioning proposal.
Contractor and Offshore Operation Services Provider - Consortium of Korean Contractor Activities	High They are highly interested in making this pilot project successful.	Low They do not deal directly with Government Institutions that approve the permits that are required for them to execute the works.	Low They do not have the power to stop the project.

Stakeholders	Interest	Influence	Power
Indonesian Navy	Low They need to be kept in the communication loop with regard to activity at the location.	Low The Navy is not required to provide input to the process unless the location is sensitive or related to the Navy base/practice area.	Low No approval is required from the Navy during the Attaka Pilot Project.
Local Communities	Low As the platforms are located within 9 km from the line, there is low interest from local communities, also because the operator conducted socialization with villagers and local communities prior to the offshore campaign.	Medium-Low For the Pilot project, the community influence level is relatively low due to there being no sensitive issues with the location.	Low No approval is required from the Navy at this point.
Local Authorities e.g., East Kalimantan Provincial Government, Bontang Fishing and Marine Services NGO	Medium This stakeholder has a medium interest related to the location of the rig-to-reef and offshore work. Low to Medium Depending on the location, NGOs may have low to medium interest in the Decommissioning Project.	Medium-Low The influence is also considered medium due to they are not directly involved in the decision-making. Medium In the Pilot Project, no problems were encountered with the NGO.	Low The local authorities did not issue specific approvals for the decommissioning process. Low No approval is required from the Navy at this point.
Third-Party – Buyer of Scrap	High The buyer of scrap has a high interest in offshore decommissioning projects, for example, Krakatau Steel or any foreign company in metal smelter or steel fabricator.	Low They have some influence to reduce the cost of decommissioning if the auction can be done offshore.	Low They do not approve any permits, nor can they stop the project.

CONFLICT OF INTEREST

The authors declare that they do not have any conflict of interest.

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