A Study on Logistic Setup Challenges During a Schedule Offshore Platform Shutdown in Petronas Carigali Kerteh, Terengganu

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Abstract

Plant turnaround shutdown is a fundamental asset management in capital intensive process-based industries. Offshore platform is like a 'town' in the middle of the sea with a facility for well drilling to explore, process for petroleum and also natural gas, to extract and store. The platform also has facilities for workforce as well. Shutting down an offshore platform for the schedule maintenance is a risky activity that could cost millions of dollar if not properly managed. The success of Offshore platform schedule shutdown is heavily depending on the close coordination among the stakeholder of the project including meeting the logistics requirement. In offshore schedule shutdown, logistics play a critical role in the whole process of the shutdown due to restricted space available for working area, accommodation, and storage. The design for offshore platform include all the requirements including the living space for workers, space for office and many more. The successful implementation of turnaround among others depends on the appropriate provision of institution and organization for the governance of the event. Moreover, it is rare to find literature on organizational characteristics of plant turnaround shutdown. The purpose of this study is to explore the challenges of logistics setup during a schedule shutdown in offshore platform which turn to be a major problem for oil and gas company. In this research propose a framework for examining the organizational challenges during the plant turnaround shutdown and researcher has purpose the efficient way that could lead to the successful initiative for the company. For data collection, researcher is using group focus interview the targeting team and also from the books, journal or website.

Keywords: Logistic, Challenges, Offshore Platform, Organization, Management

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INTRODUCTION

The turnaround is known as shutdown are one of the most important operation that happen on the platform of oil and gas or the event that will take place once in a few years. A turnaround or shutdown is the process when the plant that is always producing production turn to a non-production. This happens when the operation of the plants is put to halt in order to give ways for the operation time to give the maintenances on the machines. The turnaround happens in order to give them the attention to the activities like cleaning, checking for the corrosion, inspecting and testing the equipment and the machines.

Not only that, the turnaround need to be plan ahead of time because the turnaround takes a long time to inspect and test and the planning also need to be done right after the previous turnaround has ended, (STI Group 26 Mar 2013). If the shutdown happens, there will be a loss of production such as excavation of oil and this will result in huge loss of money. Due to this, there is a time lag due to the testing and inspection process taking a long time to do as they manage this heavy material involves a huge loss when the machine is found not working properly. When a sudden shut down occurs, the losses during processing the crude oil will also negatively impact the Malaysian economy when oil cannot be produced and supply to a particular

country. We are our country with a huge sum of money as profit after Successfully sell oil exploration process.

According to the oil and gas IQ (2014) state that every shutdown or turnaround need to be planned ahead in order not to caused problem for the company. The reason is because once the platform has been shutdown for maintenances it will take a long time recover to its track. The duration that it takes to gives inspection and testing to the machines is around two month before it can get back on its tracks. So the company need to have plan ready for all of the problem that may occur. If there are any unplanned shutdown or turnaround happens on the platform it will cause chaos on the company and the negative impact on the economy. But by planning the turnaround and shutdown the company can gain their profit like what we can see from the UK oil and gas industry has already contributed £8 billion per year and they had been running the company for about 4 decades.

The main objective of logistic setup challenges during a schedule platform shutdown include to make improvements to offshore logistics preparations and investigate the challenges during a schedule offshore shutdown. Overall, plant turnaround shutdown demands a large workforce temporarily to carry out the event. In addition, thousands of maintenance observes will be needed to carry out such events as much work to do in a very short period of time.

Therefore, the organizers' workforce is central to the recovery management process. Expert floating hotel ship known as flotels is

used to accommodate workers during construction and hook-up phase. This is a high cost activity because of the limited space and access to the material. With the power of a thousand people can cause limited space for them to sleep and Petronas need to find other alternatives in a short time. Man power will increase over time if equipment for maintenance is incomplete or they do not have enough manpower to do the work when closed. The purpose of this study is to identify the logistic setup challenges during a schedule platform shutdown in Petronas Carigali Kerteh, Terengganu. From the problem statement, the researcher lists the objectives of the study to find out and identify the challenges.

The objective of this study can help to handle the process of logistic setup for offshore platform during turnaround shutdown become more efficient. There are the objective of the research:

1. To identify the improvement of logistics setup offshore
2. To investigate the challenge during turnaround shutdown

LITERATURE REVIEW

According to the article from *Petronas group (2007)* state that the landscape of oil and gas is designed by a various factor. When it comes to the oil and gas company, offshore make an important rule. Offshore platform is like a 'town' in the middle of the sea with a facility for well drilling to explore, process for petroleum and also natural gas, to extract and store. The platform also has facilities for workforce as well. The design for offshore platform include all the requirements including the living space for workers, space for office and many more. The details about the design for offshore platform can refer more in journal by *George T.White*. In the industry of oil and gas, this is important to make their work run smoothly. However, all the machines and also equipment with the age and usage must do the maintenance. This is called the platform shutdown which is will do depends on the machine and also the license that DOSH (department of occupational safety and health) had given to the company to shutdown happen (*Zulkipli Ghazali, 2011*). During this shutdown, there are a challenges that the company have to face and have to planned it wisely because this can cause millions of dollars.

Most commonly, offshore platform involves in activities on the continental shelf, which is also could be used in lakes, as well as inshore waters and inland seas. For oil and gas industry, the effective planning and completing of turnaround shutdown is important to maintain the product levels and reduce the loss of revenue, and if doing the improper maintenance will leads to an unplanned shutdown (*Christopher Chinedu Obiajunwa, 2010*). On the other sides, according to (*David Matthews, 2004*) explain that the turnaround normally driven by involving the need to undertake the maintenance process for the purposes in the future production to be more efficiency and also to achieve the requirement that already set by Department of occupational safety and health (Dosh). Next, is to minimize the number of hazards accident, as well as all the rules was relate to the environmental procedure or criteria. The process for planning the turnaround shutdown usually started a month before the shutdown official date and the idea must be completed at least three months before the process of turnaround shutdown occurs (*Petronas Activity Outlook 2018-2020*)

It is a risky project if shutting down an offshore platform and can cause millions of dollars if make a wrong move. The shutdown effectively cost millions per day, (*Schedule risk challenges on offshore shutdown projects, publish in Energy International, September 2011 issue, page 9*). During offshore shutdown, there have a few risk and also their challenges to make this project run smoothly.

The article state that the first challenges are weather, it is because usually offshore works is planned for the late summer season. This statement similarly with other article from *Decommissioning of offshore installations (2011)*. This kind of risk is common because of it was consider it a connection and it just turns into an issue because of earlier delays. According to the *Mark J.Kaiser, 2007*, when serious climate conditions create, operator shutdown production and clear staff in front of the tempest, and after the tempest makes landfall, the teams come back to work, harm assessment are performed, and

facilities are repaired, whenever required, preceding the resumption of creation. Many components affect activities and add to production variability, yet a bad weather is the main factor that can possibly affect a number of structures all the while. This statement support by *Palgrave Macmillan, 2009* on their article "The job of supply vessels in offshore logistics". Another case of interaction is where the process of delays to get the equipment of offshore is not only involve in delay installation, but by having a delay it will occur more serious environment regarding to the simultaneous operation (SIMPOS) issues. It can not take every necessary step or task in the arranged of time period, when we have wanted to have the accessible workforce and also the laydown zones. By putting off the works, it will cause a conflicts with others activities on the stage and furthermore it can cause much more delays to finishing the undertaking or work.

This article question that "if we do not manage to stick to the plan, would the beds we've allocated for our own offshore crew still be available?". Once the management cannot manage to stick to the current plan, it can cause the process to allocated of offshore crew in a proper condition. For example, the offshore crew do not have an enough space in the platform so that it can cause a problem, by having this kind of problem during the offshore shutdown, it can give negative impact which productivity will be expressively reduced. The most worse part if do not stick with the current plan, it will affect the shutdown project and finally the project will become unsuccessful project. *Halvorsen-Weare et al. (2012)* said that, the problem has been discussing which will consist of the result of the best fleet arrangement by an onshore supply depot for the purpose of repairing a set of process for offshore installations, and also outcome of best routes and timetable for offshore supply vessel (OSVS). One project required only one team management to handle the project from the beginning until the end of the project complete it is because to ensure the project can be done by following the time duration that already plan. Shutdown will be rare and also expensive, during this stage a platform operator accepts the chance to sneak in different extension which can cause the space zone and accommodation to be more constrained and furthermore will make the key assets be inaccessible if there are someone plan to use that facilities.

RESEARCH METHODOLOGY

Sample sizes in qualitative research are normally small, (S. de Lacey, 2016). The biggest sample sizes do not create a better applicability, in light of the fact that there be excessively information for satisfactory analysis. Rather, the idea of sampling in qualitative studies is to deliberately choose particular subjects to look at with the end goal to increase further understandings of the characterized issues, (*Creswell, 2003*).

This research is only focusing on Petronas Carigali Kerteh, Terengganu which is interview with a targeting the team that conduct the platform during turnaround shutdown. With this interview, the researcher can get more information regarding this issues and at the same time can cover all the issues during platform shutdown. In this research study, the researcher focusing in a small group for interview session. With this small group, the researcher can focus more on the question about the platform shutdown and at the same time can get details about the issues. This is because, in this oil and gas company which is in Petronas Carigali, only a few people that have a knowledge about handling this challenges process which is four (4) team that already state by the researcher before. This four (4) team will conduct the platform and will find the solution in every challenges that will happen during this shutdown. This team make an important role during the process of shutdown. It is important to understand the theory of qualitative data collection techniques before designing the interview questionnaire. The data collection techniques for qualitative research can be classified into four major types which is interviews, observations, document review and focus group discussion (*Elmusharaf, K. 2012*).

In this study, the researcher will be using an interview technique with using a focus group to get the information from Petronas Carigali Kerteh, Terengganu because with this method, the research

will get more valid information from the team who handle the process of platform turnaround shutdown and can state the issues that happen during this process. Based on the research study, there is a lacking of research about this issues, however the researcher will be going to pursue this research with qualitative method because of this reason.

The researcher will interview the targeting team in Petronas in one room and using a tape recorder and at the same time taking a notes for data collection. The interview with the team in Petronas Carigali in Kerteh, Terengganu in this study were aimed at identifying the challenges and issues that can affected the process of shutdown in platform. This variable was intended to be compared with the previous research from journal and article.

Interview is a two way communication which permits an exchange of idea and information. As a research instrument interview is a conversation carried out with the purpose of obtaining specific information. In interview, the interviewer can explain clearly what the research is about. Researcher also can identify and ask question that he wants. If the interviewee misinterprets or also does not understand the question, the interviewer can further elaborate or rephrase the question.

For this research, two types of interviews was conducted one is structured interviews which are rigidly standardized and follow a list of previously prepare questions. Second types of interview used by researcher are semi-structured interviews. From this interview, interviewers asked some previously prepare questions as well as unprepared question based on the answer of the interviewee.

According to Halim, 2010 procedure to conduct an interview can be divided into four (4) stages. The first stage involve researcher to identify the credible individual or organization who is expert in the area. Second stage is involving a preparation to design the interview question. The third stage involves interview session and the last stage is analyzing the data into meaningful information. The step can be seen as below:

1. Identify credible individual who expert in the area of research.
 - Write or call the person to inform about researcher
2. Researchers make a preparation.
 - Prepare a set of questions.
 - Learn the terminologies and vocabulary related with the topic.
3. Carry out the interview
 - Arrive on time, dress appropriately.
 - Ask question that produce extended responses.
4. Analyze the responses
 - Before researcher forget, write all the response.
 - Reflect upon the interview by giving researcher

In order to get response or reliable data for the research respondents had been selected. The table 1 shows the respondent that the researcher had interviewed.

Table 1: The respondent that the researcher had interviewed.

Organization	Position	Respondent Name	Date and place
University Kuala Lumpur Malaysian	Senior Lecturer	Dr. Zirawani binti Baharum	15 th Nov 2018 2.30 pm – 3.10 pm
Institute of Industrial Technology	Senior Lecturer	Dr. Mohd Yazid bin Md. Taib	15 th Nov 2018 4.30 pm – 5.15 pm
(UniKL MITEC)	Senior Lecturer	Dr. Izatul Husna binti Zakaria	15 th Nov 2018 5.20 pm – 6.10 pm

FINDING AND ANALYSIS

For the qualitative approach, researcher used interview as a method to collect the data. During the interview session the researcher will interview three lecturers from UniKL MITEC.

Table 2: Respondent information

Respondent	Position	Department	Date & Time
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Dr. Zirawani binti Baharum	Senior Lecturer	Technical Foundation	15 th Nov 2018 2.30 pm – 3.10 pm
Dr. Mohd Yazid bin Md Taib	Senior Lecturer	Industrial Logistic	15 th Nov 2018 4.30 pm – 5.15 pm

Table 3: Interview Question and Responses

1) Data is organized and being prepare for analysis	As when the researcher gained the data from the interviewsessions which the respondents are come from lecturers UniKL MITEC which is from Technical Foundation and Industrial Logistic department, after that, the data will be transform into transcript
2) Read all the data collected.	After transcription is done, researcher must be understand on what the respondents try to deliver and answer the question, after that record all the conversation for references.
3) Making a coding from the data	The way the researcher do the coding is by separating the themes by following: <ul style="list-style-type: none"> • Challenges of platform shutdown. • Cost involve during platform shutdown. • Whose involve during platform shutdown. • Plan before platform shutdown.
4) Coding process	Is use to generate the description of the setting or the people as well as the theme for analyzing
5) Theme and description presented in table form	All the data and evidence that have been collected must be compiled together by following the themes. Below is the formula for qualitative data coding. <ul style="list-style-type: none"> • $T \times P \times L$ • T = Transcription • P = Page • L = Line
6) Final step is making interpretation	Based on the data collected and strong evidence a complete interpretation can have been done successfully

In this interview, the researcher has interview 3 lecturer from UniKL MITEC base on our title a study on logistic setup challenges during a schedule offshore platform shutdown in Petronas Carigali, Kerteh Terengganu which is Dr. Zirawani binti Baharum as a senior lecturer from technical foundation, Dr. Mohd Yazid bin Md. Taib as a senior lecturer from industrial logistic and Dr. Izatul Husna binti Zakaria as a senior lecturer from industrial logistic.

Question 1: Discussion on “can you explain the procedure of platform shutdown?”

In this discussion, the question is based on to archive the objective for this study. This is based on what we need to know in the study of turnaround platform shutdown and the procedure of handle the platform shutdown. Based on the answer from the interviewer, the procedure that we get are turn off power pump and treatment, disconnected from hose bibs and drain all the water from the internal plumbing?

Question 2: Discussion on “can we avoid doing offshore turnaround shutdown?”

In this question, we ask based on how they can improve the challenges during platform shutdown and the safety during turnaround. For the answer, they must do the shutdown in every platform to make sure the production will be run smoothly. In every once a year or twice a year they must doing the maintenances at the platform. When there has an unplanned shutdown, it will affect the production if we are not doing the maintenance. Based on the study, what we can get is every company not only oil and gas company need to plan the turnaround platform shutdown to make sure the smoothest production on that company and avoid the unplanned shutdown platform because the unplanned shutdown can affect the production.

Question 3: Discussion on “what kind of challenge that happen during shutdown?”

In this discussion, we get this question based on the problem statement that we get before. Every process of maintenance has their own challenges that they need to face, so we need to know what kind of challenges during the turnaround shutdown. From the interview, we get 3 challenges that have during turnaround shutdown, which is a bad weather, limited space and distance.

Question 4: Discussion on “how long does it takes to complete the platform shutdown?”

This question is based on data collected in plan turnaround shutdown that have needed a few step or procedure to make maintenances at platform. From that we want to know the estimate time that they need to do to complete the maintenance to make sure the production will run as usual. The interviewer said that mostly estimate time for doing a complete turnaround platform shutdown are in once a year or in twice a year. It is because to cut the cost in maintenance and also did not want to take a long time for doing the maintenances because it will effect the production line and increase the cost. Other than that, the tendency to always measure the length of operation in time targeting a shorter recovery period at optimal costs, combined with reliable operations running on the next cycle.

Question 5: Discussion on “what is the average cost that involve in planning conducting shutdown?”

This discussion is based on the plan of the maintenances that they do at platform during turnaround shutdown. These situations have been in every year to make sure the production process run smoothly without any problem. So, the top management has the cost analysis before doing the maintenances. This cost was based on the company to determining the total cost of a turnaround is, at present, a subjective exercise because differences in culture from company to company mean that differences factors and , in some cases , a differences logic is used to determine it.

Question 6: Discussion on “can you please share who or with party involved in the platform shutdown?”

In this discussion, we want to know which department was involved during offshore turnaround shutdown. The department that involve during offshore shutdown is logistic coordinator, construction team, company site representative and operation team. This four (4) team will conduct the platform and will find the solution in every challenges that will happen during this shutdown. This teams are very importance during the turnaround shutdown to make sure the process flow run smoothly.

Question 7: Discussion on “if the bad weather happens during the platform shutdown how PETRONAS handle that kind of situation?”

In this discussion, the process of doing the turnaround shutdown at platform, we must face the unexpected challenge like bad weather. This situation is having the problem to maintenances process in term of the tools, equipment or components cannot arrive in the right time. It is can affect the process of maintenances and affect a number of structures all the while. It is where the process of delays to get the equipment of offshore is not only involving in delay installation, but by having a delay it will occur more serious environment regarding to the simultaneous operation (SIMPOS) issues. For now, Petronas will hire a fast crew boat (FCB) to delivered the equipment and also will find the vessel who willing to rushing through the bad weather.

RECOMMENDATION

This research was carried out the improvement in recommendation. The researchers have found the logistic challenges

that happen during shutdown. By conducting the interview there are many process and many step involve in the completing the logistic activities.

The first objective of this research is to investigate the logistic setup process during turnaround shutdown. The objective includes to investigate the challenge during turn around shutdown. The researcher has interview the lecturer in Unkl MITEC which has been approved and signed.

The reason why we need to hire the expertise worker is because to make sure the process of planning turnaround shutdown can be done with more efficient. Not only that, the workers with their experiences will be able to handle any unexpected event that would happen in the future. This will also reduce the cost of time and money. On top of that, with this expertise worker, they will be able to solve all the challenges even with the limited spaces on the platform or during a bad weather. With their previous experience, they know how to handle the situation with calmness.

The next recommendation involves on the documentation of the checklist of the product involve in each plan during shutdown. By doing this it will give the plantation employee more knowledge on what happen in previous years with all the improvement in order to avoid the same problem from occurring. They can do advanced step so it will be easier for them to complete the work within the time frame. With the advanced step incase there are any problem that occur always occur in the previous years they will be able to counter measure for example the bad weather where they will counter it by hiring a bigger boat and sturdier which will be able to go through the bad weather like the storm. This is the advantages the checklist to make future shutdowns more successful. By doing the checklist, we will be able to identify the quality of works. With this checklist they will always do improvement every year in order to reduce the problem and loss.

As we know, the challenges that already happened in Petronas can effect the profit of the company. So, to avoid from that happens, the researcher suggests to take from previous issues and make a proper planning on the next schedule offshore shutdown. From previous issues, the company can learn how to handle it with more efficient and smooth. On top of that, the planning must be done maybe five to six months before the shutdown happen compares to previous planning that only take two until three months before the shutdown.

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