List of Process Description for Offshore Decommission

Pre-Decommissioning Marine Operations of Offshore Wind Parks

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Introduction

According to work package four of the Decom Tools application, the deliverable by the name of "List of Process Description for Offshore Decommission" shall be issued. A comprehensive study in the wind industry as well as the oil and gas industry has been conducted in order to provide this document. Evidently, there are some similarities between offshore oil and gas industry and the offshore wind industry, in particular, in terms of marine operation[1]. Notwithstanding the similarities in these two industries, there are some significant differences which have profound impact notably in the logistic and supply chain. For instance, the number of installed assets in an oil and gas field normally can vary between 1 to 5 structures whereas in an offshore wind parks, the number of turbines in a wind park are approximately between 20 to 170 in 2019[2]. Furthermore, the wind turbine components are bulky due to its geometry and size. In conclusion, since the oil and gas industry is a mature industry, the authors implemented the lesson learnt and methodologies which is coveted in the oil and gas industry. Then the methods and strategies are tailored into the nascent wind industry.

One of the possible measures to fulfill the objectives of the Decom Tools projects is to reduce the duration of operation time of the installation and cable laying vessel. The installation vessel can be either a heavy lift vessel or jack up vessel which is equipped with a heavy lift crane. During the execution of marine operations, the installation and cable laying vessel play a colossal role in the decommissioning project. They are the most expensive marine equipment for the decommissioning project. Furthermore, they emit considerable level of CO_2. One method to fulfill the objectives of DecomTools project which are 20% cost reduction and 25% CO_2 emission mitigation is to reduce the working hours of the mentioned vessels which lead to reduction of project cost and CO_2 emission. This can be attained by thoughtful planning, careful and elaborate preparation and proper conduction of the entire project.

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[1] Marine operation is any operation conducted using Vessels offshore, inshore or at terminals ashore (NORSOK Standard, 1995)
[2] Offshore Wind in Europe Key trends and statistics 2019 (WindEurope, 2020)

Hence, in this deliverable three different phases for the decommissioning have been devised as per figure 1. The first stage is pre-decommissioning activities (most left figure) in which the preparatory activities can be undertaken by deploying smaller and cheaper vessel equipped with remotely operated vehicle (ROV) to make the site ready for removal and decommissioning process. To put it more simply, by execution of the pre-decommissioning activities, the working hours of installation and cable laying vessel will be reduced considerably. The second stage concerns the removal and the transportation of offshore wind parks components to onshore for further process and recycling. Finally, the last phase deals with post-decommissioning marine operations. In this phase by executing post-decommissioning activities which are mostly sets of survey activities, contractor carry out remaining activities and then ascertain that the removal and decommissioning has been completed successfully in accordance with project requirements and relevant codes and standards. However, it should be noted that before the installation of a wind park, a certain set of activities and surveys were conducted to make the site ready for the installation. The pre-decommissioning activities are not exactly similar to the pre-installation operations. Similarly, pre-installation phase was carried out to make the site ready for the installation.
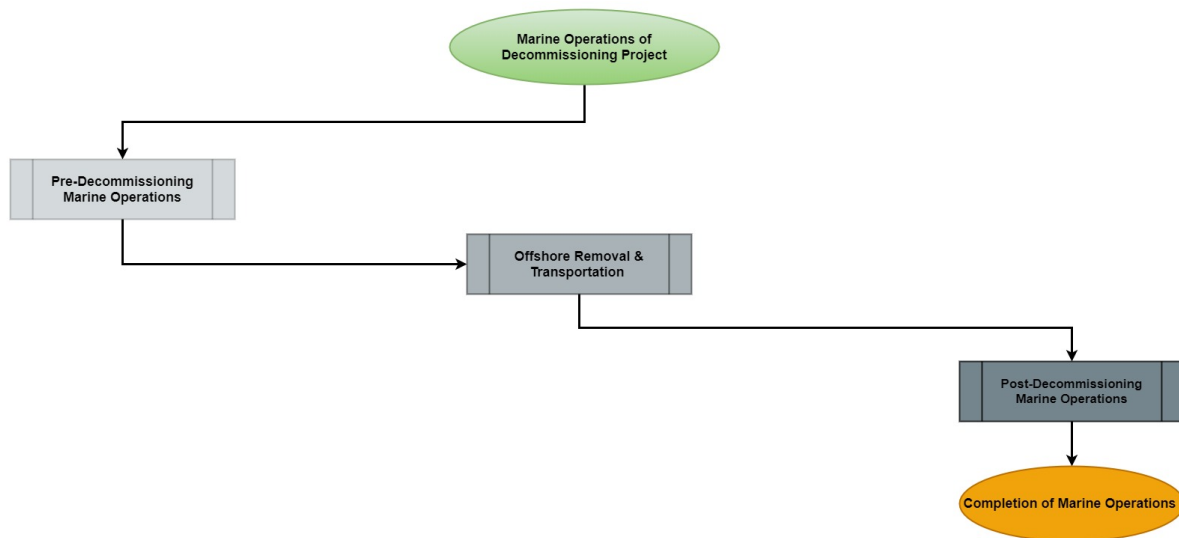

Figure 1 Sequences of Marine Operations of Decommissioning of Offshore Wind Parks

Having considered that each wind farm has different components, the required marine operations for pre-decommissioning and removal vary. These proposed activities are according to common practice, industries recommendation, codes and standards. Therefore, in the document "Pre-

Decommissioning Marine Operations of Offshore Wind Parks which is part of deliverable "List Of Process Description For Offshore Decommission" with the document number "DECOMTOOLS-WP4-PDOWP-EDP-A3-001" necessary marine operations for each component have been introduced (component wise).

Based on the application, the document should illustrate the required operation in the format of even-driven-process. Therefore, the authors use the open source software by the name of Draw.io[3] in order to show the overall process of decommissioning of offshore wind parks.

As it stated above, the decommissioning operation is divided into three different phases. Therefore, for each phase a separate document is prepared. Each document has an identical name and number which is following the below principal.

Project Name-Work Package Number- abbreviation of name of Document - Document Format-Document Size- document number

DECOMTOOLS	WP4	PDOWP	EDP	A3	001

Project name- Work package4-Pre-Decommissioning of Offshore Wind Parks-Event Driven Process-Sheet Size-Document No.

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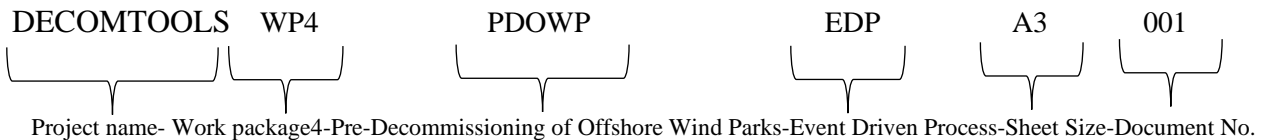
[3] Draw.io is a flexible and open source software that can show the process in even-driven format.