

THE POWER OF PREPARATION

WHITEPAPER

OSS DECK CRANE REPLACEMENT



THE CHALLENGE

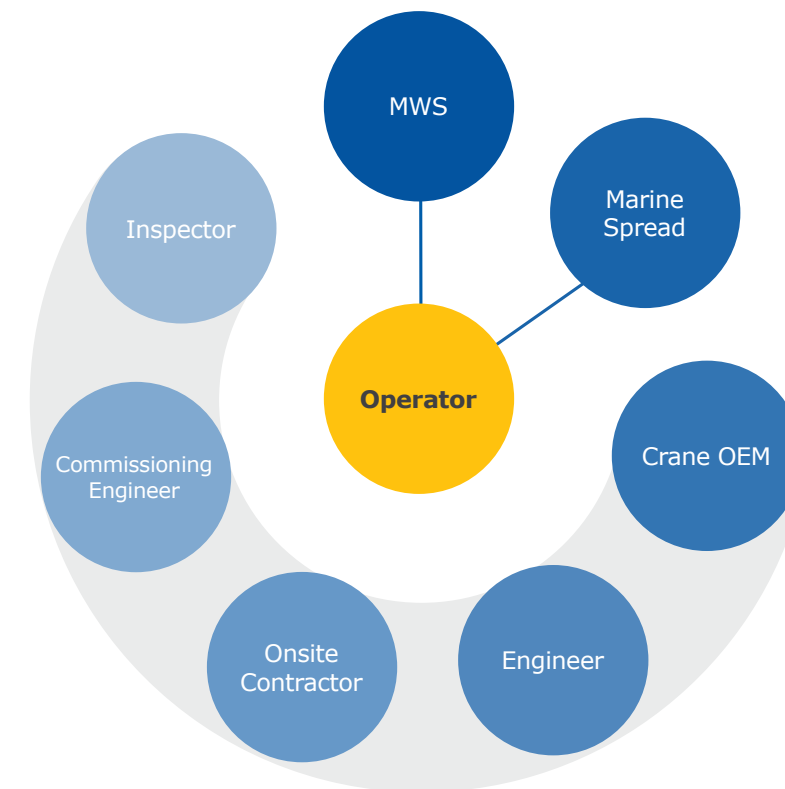
The task of replacing modules on Offshore Substations is inherently challenging, and the replacement of the deck crane poses an even greater hurdle due to the potential unavailability of any deck crane during certain periods.

While the option of deploying a crane vessel or jack-up barge may seem straightforward, complications arise when considering the need for pedestal rework or modifications, and the possibility that no suitable vessels are accessible for the project.

Moreover, managing various interfaces with the crane supplier, onsite contractor, engineer, inspector, and marine warranty surveyor introduces additional complexities and risks to the overall project.

Furthermore, concerns extend beyond logistical challenges. When opting to replace an existing crane with a new one, strict adherence to current regulations becomes paramount. The introduction of a new crane necessitates a careful evaluation of its loads, potentially requiring adjustments to the crane chart or the crane foundation. This intricate process demands meticulous attention to detail to ensure compliance with safety standards and operational efficiency.

The transition from the construction phase of the substation, where a dedicated team worked to bring it online, to the operational phase in the field brings its own set of challenges. The workforce available for the project is often limited during this phase, necessitating a multidisciplinary approach with a constrained number of personnel who may not necessarily be experts in the specific domain. This shift in dynamics requires efficient coordination and execution of the replacement project amidst operational constraints, emphasizing the need for strategic planning and expertise in managing a lean yet versatile workforce.



CONBIT REPLACEMENT PHILOSOPHY

As an integral part of Conbit's comprehensive deck crane replacement service, we introduce an offshore lifting approach that distinguishes our total project philosophy. Conbit firmly believes in optimizing your project by minimizing reliance on crane vessels and jack-up barges, and our innovative strategy may involve utilizing these resources as little as possible, or even eliminating their use entirely.

In support of the deck crane replacement, Conbit offers modular lifting systems, categorized into two types: onboard lift systems and offboard lift systems. Onboard lift systems are designed to efficiently remove the existing crane from its pedestal and relocate it to the deck. Subsequently, the new crane is lifted from the deck to the pedestal.

The versatility of the onboard lift system is demonstrated in its compatibility with both the offshore lift system and crane vessels for performing offshore lifts. This system can facilitate the removal of the existing crane from its pedestal, allowing for the preparation of the pedestal to receive the new crane. The subsequent replacement of the old crane with the new one can be managed using a crane vessel, or alternatively, Conbit's offshore lift system can be employed for the offshore lift.

Conbit's offshore lift system is engineered with lightweight components and is operated by a lift winch. This system performs effectively in performing offshore lifts between the substation's deck and the deck of a DP2 supply vessel, offering a flexible and efficient alternative to traditional crane vessel-dependent methods.



PROCUREMENT

When procuring a crane, numerous considerations extend beyond the obvious factor of cost. While pricing is a critical criterion, operational aspects must also be thoroughly assessed. To ensure a comprehensive approach, create detailed specifications outlining both minimum and desirable requirements, involving all stakeholders in the process.

During the replacement of a deck crane, upgrading the specifications for the new crane is a strategic move that significantly influences the offshore installation process and operational modes. Reassessing lifting requirements based on operational data gathered from the initial years aids in refining assumptions made during the offshore substation design. It's crucial to assess the loads that the existing crane has effectively lifted and pinpoint lifts that have been constrained by the limitations of the current crane.

Contrary to common assumptions, specifying a new crane with reduced lifting requirements can be a prudent decision, leading to cost savings in total ownership. Additionally, for lifts slightly exceeding the rated capacity, alternative lifting systems may offer viable solutions.

Reconsidering specifications for features such as man-riding, remote start-up, and other functionalities ensures a tailored approach aligned with operational needs.

In the conceptual phase of your project, Conbit can assist in generating high-level estimates for cost and time impacts.



FABRICATION MONITORING

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INSTALLATION NEW CRANE

Opting for a crane vessel to seamlessly replace the old deck crane with a new one may seem logical at first glance, yet closer assessment reveals potential challenges related to timing and the availability of suitable vessels.

The urgency to swap cranes introduces constraints on the time available for pedestal modifications, which may be necessary due to flange damage or adjustments required for accommodating new loads. The vessel must remain on standby, awaiting the completion of pedestal modifications before the new crane can be installed.

Executing a deck crane replacement project within a brief timeframe poses challenges in terms of vessel availability and high costs.

An alternative approach involves creating flexibility by separating pedestal adjustments and site preparations from the offshore lift, minimizing the need for an expensive marine spread on charter. This can be achieved through the implementation of a temporary lifting system for crane removal.

Furthermore, exploring options to conduct the offshore lift directly from the substation, rather than relying on a vessel, presents an opportunity for efficiency. Temporary lift systems can be strategically installed to facilitate the lifting of deck cranes to and from a DP2 supply vessel.



COMMISSIONING NEW CRANE

Commissioning cranes is a specialized skill often thought to be exclusive to crane manufacturers, but this is not entirely accurate. Competence in commissioning is also available through crane service companies that either support multiple brands or are affiliated as authorized service providers.

Typically, crane manufacturers dispatch a commissioning supervisor to ensure the installation aligns with the manufacturer's specifications, often a prerequisite for warranty coverage. The commissioning process, spanning several days, involves testing the crane, rendering it temporarily inaccessible and non-operational.

During commissioning, the crane's software undergoes configuration, incorporating parameters and defining no-go zones. The Site Acceptance Test serves as the final step before the crane is declared operational, utilizing the performance indicators from the Inspection and Test Plan (ITP) to verify compliance. Any outstanding requirements prompt the creation of a punch list for resolution.

Upon successful tests, a certified inspector issues an initial inspection certificate. This certificate, validating compliance, can be provided by the crane manufacturer or an accredited inspector.

BACK UP SCENARIOS

The operational uncertainty surrounding the existing crane often prompts the initiation of deck crane replacement. Throughout this period, Issues with the existing crane may lead to its non-operational status. Lifting requirements on the substation may arise, necessitating proactive planning for backup scenarios.

Considering the full lead time of the replacement project, operators should explore two contingency scenarios: rental of a backup crane and establishing a call-off service contract.

Rental cranes, available with short notice, offer a swift solution in case of existing crane failure. It is crucial to assess the availability of rental cranes and identify relevant interfaces such as power supply and flange connections.

Alternatively, a service contract provides a solid backup plan, ensuring service technicians are readily available for crane repairs during periods of operational downtime. Implementing these backup strategies enhances project resilience and minimizes disruptions due to unforeseen circumstances.

Make the two backup scenarios part of the turnkey service contract.



LIFECYCLE SUPPORT

Following the handover of the crane, it enters a phase of regular maintenance and undergoes scheduled inspection intervals.

An annual inspection, typically completed within one or two days, is conducted to ensure the crane's ongoing functionality, the duration dependent on its size.

Every five years, a more comprehensive inspection takes place, requiring 3 to 5 days and involving a team of 3 or 4 technicians.

These inspections can be carried out by authorized inspectors, either approved by the local government or per ILO152 standards.

In addition to inspection requirements, the crane necessitates service, which is categorized into preventive maintenance and corrective maintenance. Both types of maintenance can be consolidated into a unified service contract for streamlined management.



THE CONBIT SOLUTION

Conbit is strategically designed to address the specific challenges associated with replacing deck cranes on offshore substations. Our purpose is to minimize the risks inherent in deck crane replacement projects, offering a solution that can significantly reduce interface risks by up to 80%.

With Conbit taking the lead, we take on the comprehensive management of the entire project, maintaining direct communication with you and the Marine Warranty Surveyor to ensure seamless coordination.

Leveraging our team of engineers with a strong structural background, Conbit excels in performing structural analyses of offshore structures and designing crane interfaces tailored to the unique requirements of each substation.

Our lifting equipment, characterized by its lightweight and modular design, eliminates the need for a crane during assembly, allowing for efficient and hassle-free operations.

Conbit's dedicated crews are proficient in executing all offshore lifting and installation works. Our crane division is equipped to handle the commissioning and testing of the crane and issuing the initial inspection certificate. Additionally, we can support you in procuring the crane and oversee the fabrication process on your behalf.

For added security and flexibility, Conbit's rental fleet offers backup cranes in the event of unforeseen circumstances, ensuring continuity in your project even if your existing crane encounters issues. In essence, Conbit serves as a versatile partner, capable of contributing to various facets of the project.

In certain instances, Conbit can assume responsibility for the contract with the Marine Warranty Surveyor and the marine spread supplier. However, we acknowledge that in many cases, it may be more pragmatic for the operator of the substation to take on the responsibility for the Marine Warranty Surveyor and the marine spread.



PLANNING

Conbit's slogan, "the power of preparation," underscores the effectiveness of intricate offshore projects. Throughout the preparation phase, we facilitate the procurement and fabrication of new cranes while also coordinating offshore works preparation. To ensure comprehensive preparation, including the acquisition of a new crane, it is advisable to allocate a lead time of one year.

31733_Belwind_Substation_crane_replacement				PRELIMINARY PROJECT DURATION PLANNING														Installation Engineering	
ID	WBS	Task Mode	Task Name	Month 1 w1 w2 w3 w4 w5 w6	Month 2 w7 w8 w9 w10 w11 w12 w13 w14 w15 w16 w17 w18	Month 3 w19 w20 w21 w22 w23 w24 w25 w26 w27 w28 w29 w30 w31 w32 w33 w34 w35 w36 w37 w38 w39 w40 w41 w42 w43 w44 w45 w46 w47 w48 w49 w50 w51 w52 w53 w54 w55 w56 w57 w58 w59	Month 4 w1 w2 w3 w4 w5 w6	Month 5 w7 w8 w9 w10 w11 w12 w13 w14 w15 w16 w17 w18	Month 6 w19 w20 w21 w22 w23 w24 w25 w26 w27 w28 w29 w30 w31 w32 w33 w34 w35 w36 w37 w38 w39 w40 w41 w42 w43 w44 w45 w46 w47 w48 w49 w50 w51 w52 w53 w54 w55 w56 w57 w58 w59	Month 8 w1 w2 w3 w4 w5 w6	Month 9 w7 w8 w9 w10 w11 w12 w13 w14 w15 w16 w17 w18	Month 10 w19 w20 w21 w22 w23 w24 w25 w26 w27 w28 w29 w30 w31 w32 w33 w34 w35 w36 w37 w38 w39 w40 w41 w42 w43 w44 w45 w46 w47 w48 w49 w50 w51 w52 w53 w54 w55 w56 w57 w58 w59	Month 11 w1 w2 w3 w4 w5 w6	Month 12 w7 w8 w9 w10 w11 w12 w13 w14 w15 w16 w17 w18	Month 13 w19 w20 w21 w22 w23 w24 w25 w26 w27 w28 w29 w30 w31 w32 w33 w34 w35 w36 w37 w38 w39 w40 w41 w42 w43 w44 w45 w46 w47 w48 w49 w50 w51 w52 w53 w54 w55 w56 w57 w58 w59	Month 14 w1 w2 w3 w4 w5 w6			
1	1		Procurement New Crane																
2	1.1		Vendor selection																
10	1.2		Expediting																
14	1.3		Manufacturing																
17	1.4		Factory Acceptance Test																
23	1.5		Transport																
27	2		Preparation Offshore Installation																
28	2.1		Concept procedures																
33	2.2		Site visit																
37	2.3		Detailed procedures																
45	2.4		HSE Preparations																
49	2.5		Equipment preparation																
54	2.6		Load test																
63	2.7		Equipment Mobilization																
68	2.8		Crew Mobilization																



Conbit (HQ)
Steenoven 5
5626 DK Eindhoven
The Netherlands
E: info@conbit.eu
T: +31 40 711 45 05

DKAT
Simon Stevinweg 48
6827 BT Arnhem
The Netherlands
E: verkoop@dkat.nl
T: +31 263 84 90 60

Conbit USA Inc.
800 Town & Country Blvd., Suite 500, Houston, TX, 77024
USA
E: info@conbit.eu
T: +1 346 744 1516

Conbit Malaysia Sdn Bhd.
CEO Suites, Level 26, Menara
Maxis Off Jalan Ampang
50088 Kuala Lumpur
Malaysia
T: +60 18 2522 157