



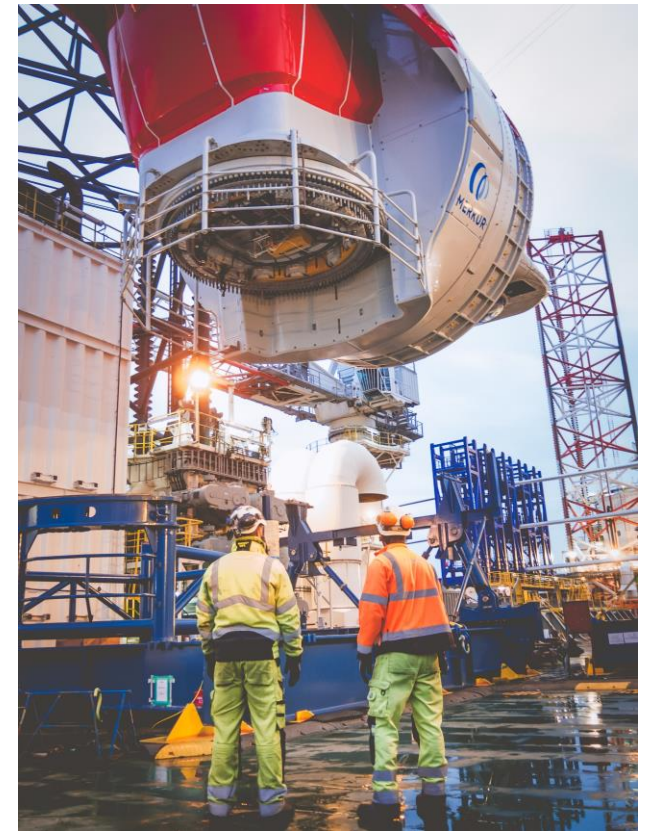
NaRval Solutions

*Your partner for the definition,
preparation and execution of your
offshore wind projects*

An independent engineering and services company



- NaRval Solutions was founded in 2019 by former offshore installation engineers.
- Our story started when we realized that the Majors were more focused on their core business, the design and manufacturing of powerful and cost-efficient wind turbines, and less on project execution.
- As an independent partner, our objective is to **support the definition, the preparation and the execution of offshore wind projects** and in particular
 1. The final clients in the definition of project / ITT / FEED studies
 2. The turbine & foundation supplier in the preparation and execution of offshore construction projects. We provide support from concept studies to project completion
 3. All actors involved into the preparation and execution of offshore wind projects
- Based in Nantes, France, and ready to support its customers all over the world



Our team



Vincent CAZENAVE

Offshore construction manager
Former Navy Officer and helicopter pilot
Joined the wind industry in 2010

Creator of installation Department within Alstom/GE; recruiting and leading 20 engineers and technicians to develop all procedures, tools, documentation and execute offshore wind projects.
Offshore Construction manager on major offshore Wind Projects



Julien PAUMIER

Port & Logistics engineer
Joined the wind industry in 2013

In charge of the logistics and harbors process for the execution of large Offshore Wind projects. Extensive experience as site manager for the reception, handling and storage of components including tower assembly at quay. Definition of civil works requirements, lifting equipment and manpower to update create terminal for Wind Offshore industry in US/EU/JP. Specialist in logistic flow 3D simulation.

and in contact with a large network of high skilled professionals....

Our Services for your offshore projects



Strategy

Planning

Execution

<ul style="list-style-type: none"> • Elaboration and comparison of installation methods • Selection of marine spread: jack-up or floating? • Weather downtime and planning, Costing of a project 	<ul style="list-style-type: none"> • Drafting or review of the entire documentation package for a project : method statement, deck layout, lift plans & risk assessment, users manual • Review of transport, handling, lifting concepts and tools 	<ul style="list-style-type: none"> • Training of the offshore teams • Supervision offshore (construction leads) • Feedback and improvement process, REX
<ul style="list-style-type: none"> • Selection of potential harbor facility (Europe, US, Japan...) • Harbor assessment & logistic analysis 	<ul style="list-style-type: none"> • Drafting of port layout including bearing capacity, storage areas • Specifications for civil works • Support development of Port Facilities • 3D simulation to optimize the overall logistic 	<ul style="list-style-type: none"> • Training of the pre-assembly and logistic teams onshore • Supervision Onshore (Site management or Advisor) • Quality and REX

Strategy for Installation



Installation Strategy

- Definition of the best marine spread for a given offshore wind project based on multiple criteria: marshalling harbor constraints, foundation type, soil data, vessel availability, etc.
- New regions for offshore wind have specific strategies: Japan, China, US
- Comparison of multiple scenarios (start dates, more than 1 crane vessel, feeder barges, etc.)

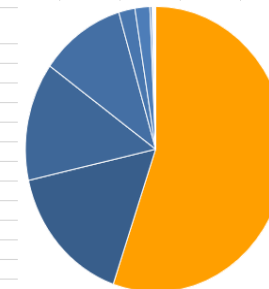
Planning & WDT

- Installation planning preparation based on the strategy & the project data
- Weather downtime assessments based on site specific weather, vessel operating limits & lifting limits for WTG components
- Costing of a project

Top Tasks Contributing to Mean WDT

All Year

WORKING	55,3%
Blade lift 1 (Group)	16,2%
Jack-down at Site (Group)	13,4%
Transit to windfarm (Group)	10,5%
Tower lift	2,0%
Nacelle lift	1,8%
Blade 1 LO	0,3%
Blade 2 LO	0,1%
Blade 3 LO	0,1%
Tower 1 LO	0,1%
Tower 3 LO	0,1%
All Other Tasks	0,1%



WORKING	Blade lift 1 (Group)
Jack-down at Site (Group)	Transit to windfarm (Group)
Tower lift	Nacelle lift
Blade 1 LO	Blade 2 LO
Blade 3 LO	Tower 1 LO
Tower 3 LO	All Other Tasks

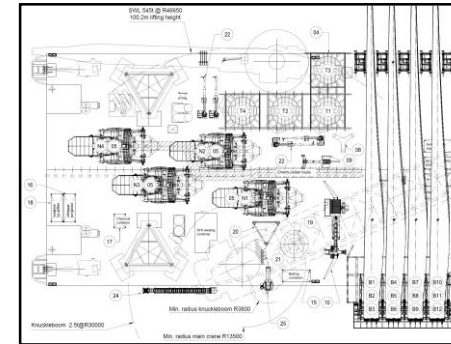
Planning: Documentation for execution



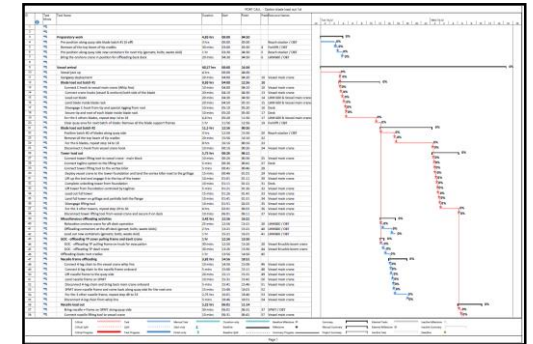
Full package of documentation for the execution of an offshore wind project:

- Method statement for transport, pre-assembly, loadout, offshore installation & mechanical completion
- Rigging drawings, lifting drawings, Lift plans, site layout, deck layout
- WTG assembly instructions
- User Manuals of the tools used for lifting and assembly
- Inspection and Test Plan package (check list)
- Risk Assessment
- Review of documentation package (as Third Party)

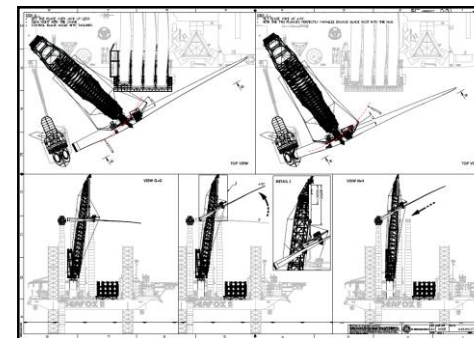
=> Done & Approved by Customer and Marine Warranty Surveyor for the Block Island and Merkur projects



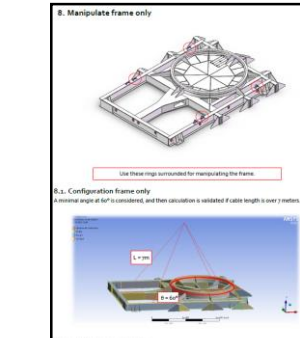
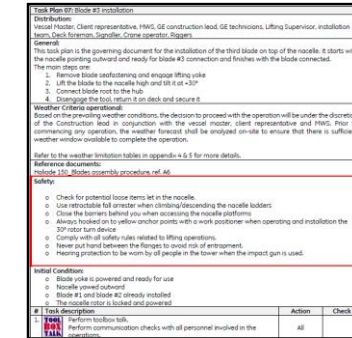
Deck Layout, construction vessel



Execution Planning



Lifting drawing & task plan extract of blade installation method statement describing the installation of the GE 6MW from the jack-up Seafox 5



Extract of the User Manual of the 12MW nacelle transport frame

Port facility selection, adaptation and management



Port Audit

- Assess the suitability of harbor for Wind offshore activities
- Define the strength and weakness of each harbor
- Provide technical support for Harbor development
- Compare port strategy for Wind offshore projects
- Deep knowledge of Harbors located in US/EU/JP

Drawings

- Define port layout considering equipment
- Define cranes for lifting activities and associated implantation

Documentation

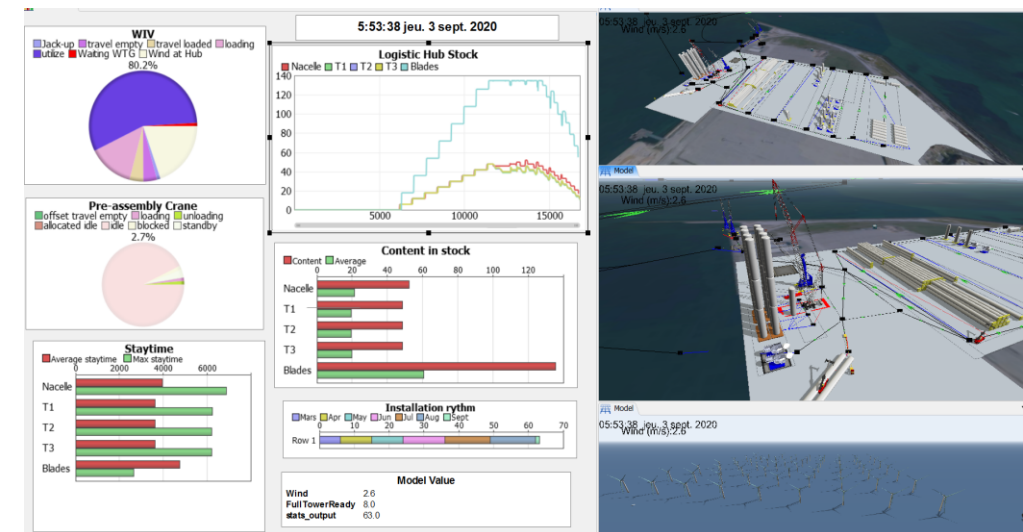
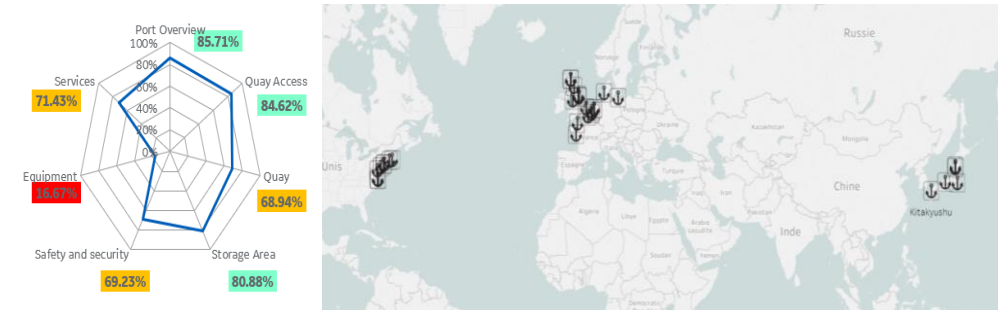
- Redaction of procedure for project execution
- Review of RAMS

Simulation

- Build 3D decision making tool (flexsim)
- Model creation to simulate a project execution taking into account, planning, resources, WOW
- Simulate scenario to improve project execution
- Optimize process

Execution

- Provision of tower assembly manager
- Provision of site manager



Execution



2016 Block Island. First US offshore wind farm. 5 x 6MW turbines

- Definition of optimum strategy with European WIV and US Feeder Vessels
- Contracting and training all European and US manpower
- Drafting lifting plans and Method Statements
- Leading the execution offshore



2018 Merkur. Germany. 66 x 6MW turbines

- Design and delivery of all installation tools
- Contracting and training Manpower onshore/offshore
- Drafting and approval of lifting plans and Method Statements
- Leading the execution onshore/offshore

2019 Haliade X. Netherland Prototype 12MW.

- Specifications and design of all new transport frames and lifting tools
- Lifting plan, Method Statement, Assembly Instructions
- Site preparation and management
- Construction lead





Don't hesitate to contact us if your project requires innovative, fast and practical solutions.

email: contact@narvalsolutions.fr

Tel: +33674752489

Web: www.narvalsolutions.fr

We are ready for your next challenge and we look forward to work together.