



ELECTRICAL UTILITIES | MARINE | MATERIAL HANDLING | MINING | OIL AND GAS | PETROCHEMICAL | PUBLIC WORKS | RENEWABLE ENERGY

Contact Info

Offshore Wind Capabilities Presentation

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Offshore Capabilities Relative to Offshore Wind

- Engineering of offshore oil and gas, onshore utility power, remote independent power, and port facilities.
- Small and large projects.
- Technical and project management skills applicable to U.S. offshore wind projects currently being planned and licensed by BOEM.
- Offshore oil and gas experience directly relevant to offshore wind projects.
- Engineers of record for our local public electricity utility.
- Decades of experience in remote power installations for industry.

SUMMARY:

NELSON's track record of support and innovation in offshore projects and power generation & transmission will interest companies engaged in projects to harness the renewable wind resources created by conditions offshore in the U.S. or world-wide.

Capabilities to Support Offshore Wind

NELSON's project experience includes the following:

- Offshore supporting structures and foundations
- Offshore power generation facilities
- Crew living quarters
- Infrastructure facilities such as logistics shorebases and marshalling yards
- Power (transmission, substations, underwater and horizontal directionally drilled cables, battery storage)
- Project management, scoping, planning, and purchasing services
- Environmental permitting

Capabilities to Support Offshore Wind - Examples

35kV Offshore Power System Reliability Project (2015 - California)

35kV Gas Insulated Switchgear
(GIS) installation offshore – first
time in North America using ANSI
design



35kV GIS – on-site
factory acceptance
test (FAT) in
Frankfurt



35kV GIS
Offshore
Building

Capabilities to Support Offshore Wind

35kV hybrid submarine cable (static & dynamic)

1200' max water depth

29 miles of cable



Floating cable for
shore crossing pull

Capabilities to Support Offshore Wind

**Long-I-Tube
Installation**

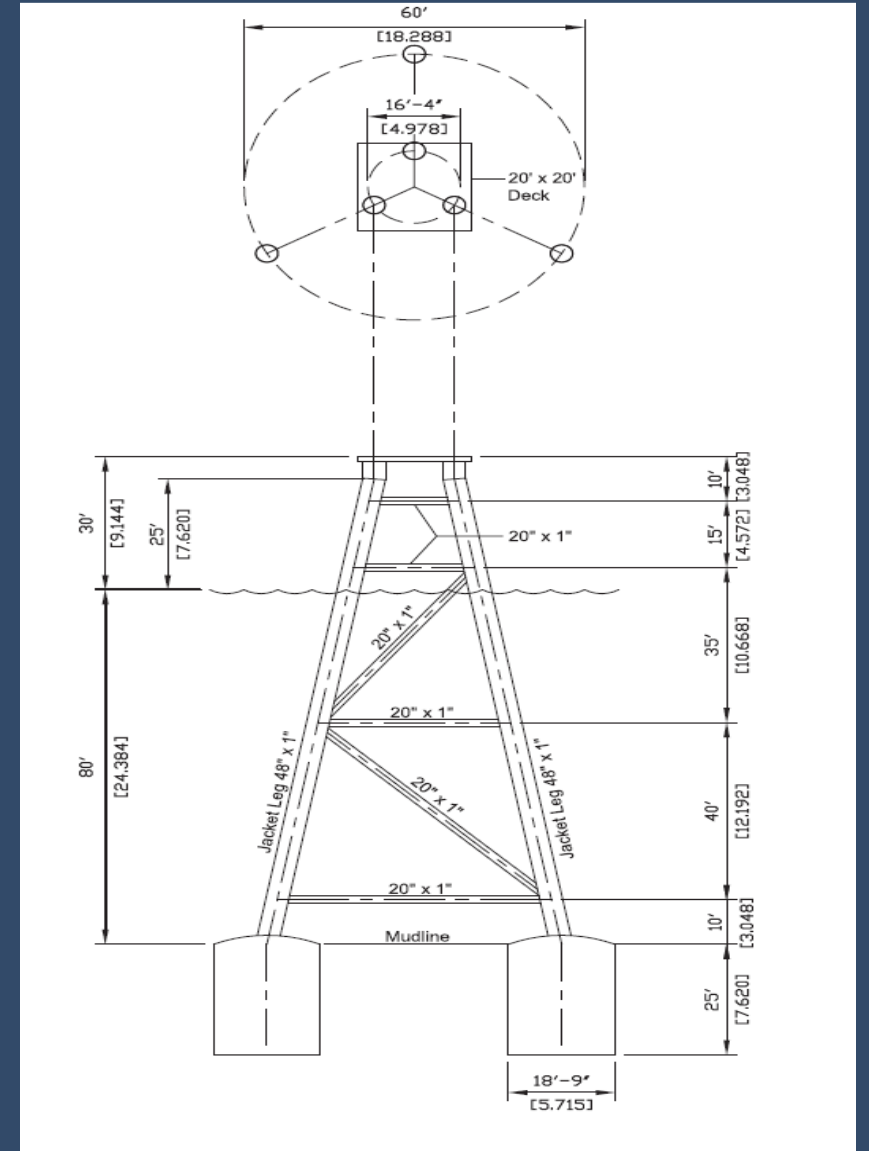


**Long-I-Tube
Fabrication**

Modularized Foundations for Offshore Wind

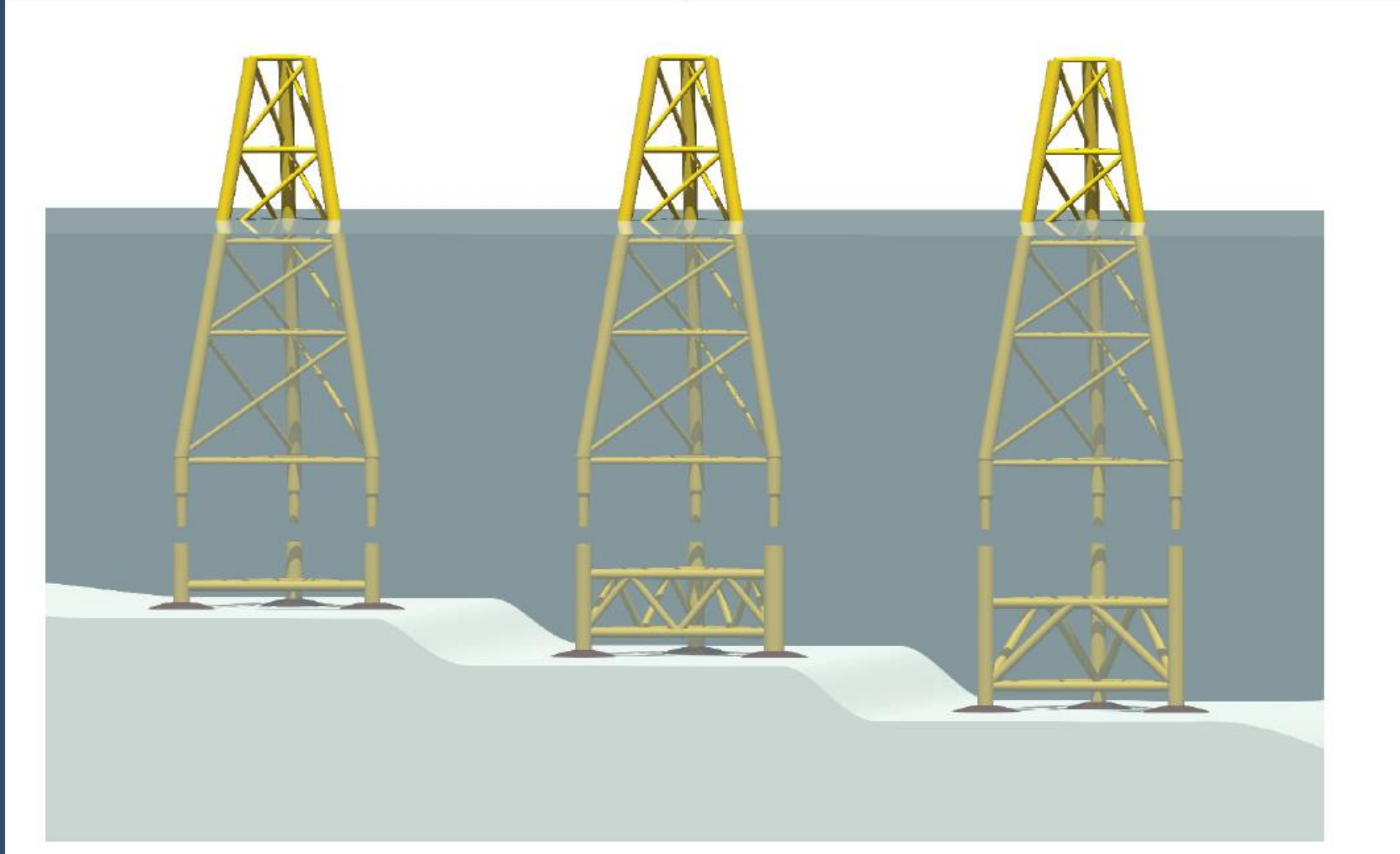


Model Diagram



Shallow water, 20m – 50m depth

Modularized Foundations for Offshore Wind Layouts



Modularized Foundations for Offshore Wind Benefits

- Standardization and serial fabrication of upper section
- Accommodates depth variability
- Eliminates pile driving, greatly reducing potential impacts on marine mammals
- Installation at any time of year, day and night
- Improved schedule and budget
- Less weight and height of upper jacket section,
- Lower-cost
- Smaller installation equipment, use of existing Jones Act- compliant vessels to transport & install
- Smaller wave loads than large diameter monopiles
- Smaller fabrication halls and coating facilities
- Facilitates incremental growth of infrastructure investment
- Design is an extension of European offshore wind farm experience, married with offshore oil & gas experience from Europe, US and world-wide installations

Substation Assistance



230kV termination structure
for Miss River crossing in
New Orleans



115 kV termination structure
for ICWW crossing in
Alabama



HDD cable bundle
(115kV) under
Intracoastal waterway
in Alabama

Battery Storage Project

Project Name: Eólica Coromuel, Mexico Battery Energy Storage System

Project Location: Baja California, Mexico

Client Name: Citec OY, Ab

Time Period: January – November 2021

Project Overview

- The technology group Wärtsilä has been contracted to provide a project-critical energy storage system for the 50 MW Eolica Coromuel, S. de R. L (ECO) Wind Farm in La Paz, Mexico. The Wärtsilä energy storage system (BESS) was designed to deliver a power output of 10 MW for the operational life of the project.
- ECO and the Wärtsilä energy storage system was connected to the local grid controlled by the National Center for Energy Control (CENACE), Mexico's Independent System Operator. The system can control the facility's ramp rate to enhance generation reliability, as well as providing frequency control and capacity.



Battery Storage Project

NELSON provided the following Electrical Engineering Services:

1. Sized the DC Cables from the battery enclosures to the inverters.
2. Calculated the size of the DC Cables including burial depth, conduit size, and conduit spacing in the output.
3. Reviewed the Bill of Material developed by Citec for the signal cables.
4. Sized the LV AC cables from the stepdown transformer secondary to the LV Switchgear.
Calculations included burial depth, conduit size, and conduit spacing in the output.
5. Sized the LV Cables from the switchgear to each of the battery enclosures.
Calculations included burial depth, conduit size, and conduit spacing in the output.
6. Made recommendations for terminal lugs for high-strand count cable such as DLO.

Deliverables:

1. DC Cable Sizing Calculation Output
2. DC Cable Schedule
3. LV Cable Sizing Calculation Output
4. LV Cable Schedule
5. Review of the BOM for signal cables



Additional Battery Storage Projects

- NELSON has three additional ongoing Battery Energy System projects in association with Wärtsilä and Citec OY, Ab located in the Caribbean Sea region.
- A NELSON project nearing completion is based in the US Virgin Islands and is a supporting power source for the conventional fueled power generation facility that we also have participated in designing.
- The remaining two projects, located in the British Cayman Islands, are in the beginning stages of detailed design.

The NELSON Difference

Longevity of Staff

- NELSON enjoys a tradition of maintaining our core staff members through the ups and downs of our business. Our loyal and dedicated staff can be relied upon to be available for our clients' long-term needs, offering experience and continuity across a wide range of projects. We currently have more than 60 employees with at least 20 years of tenure with our company.

Professionalism

- NELSON management puts great emphasis on professional licensing of our senior staff and on continuous professional development of our employees through company-sponsored seminars and mentoring programs, as well as support for advanced education for our professional staff.





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Engineering is the
foundation of civilization.

