

STX FRANCE

From Design To Construction of Offshore Wind Projects

Pierre-Paul LACAS – Hydrodynamic and Structural Engineer
Technical manager for floating offshore wind projects

pierre-paul.lacas@stxeurope.com



Company structure

Ship building background

Offshore energy business unit

References

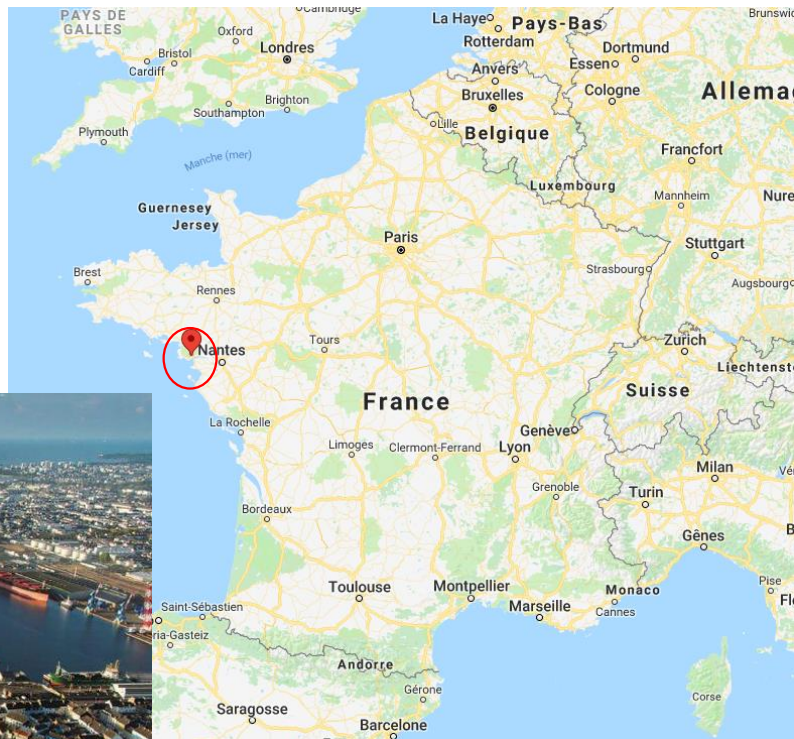
R&D programs



ABOUT STX FRANCE...

LOCATION

Saint Nazaire, France
Loire estuary
60km from Nantes



22 janvier 2018

COMPANY STRUCTURE

3 Business Units

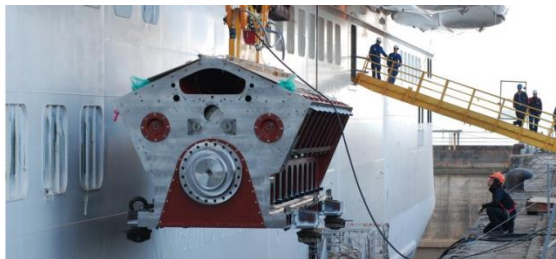


Fincantieri (~50 + 1%)
Naval Group (~14%)
French state (~33%)
Others (2%)

SHIPS

SERVICES

OFFSHORE
ENERGY



MAIN FIGURES

2,600 employees
6,000 persons on site



The largest erection dock in Europe
1,400 t of hoisting capacities
65,000 tons/year transformed steel



Offshore projects dedicated workshops

1 sheltered workshop with 2x60t hoisting capacity
6000 m² assembly area
1 sheltered painting workshop



Design and build complex naval structures

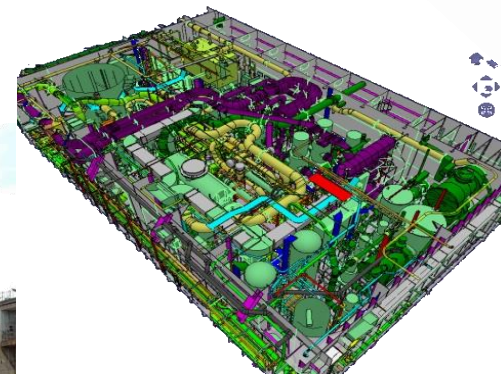
→ Manage interfaces

→ Integrate

→ Industrialize

→ Assemble

→ Commission

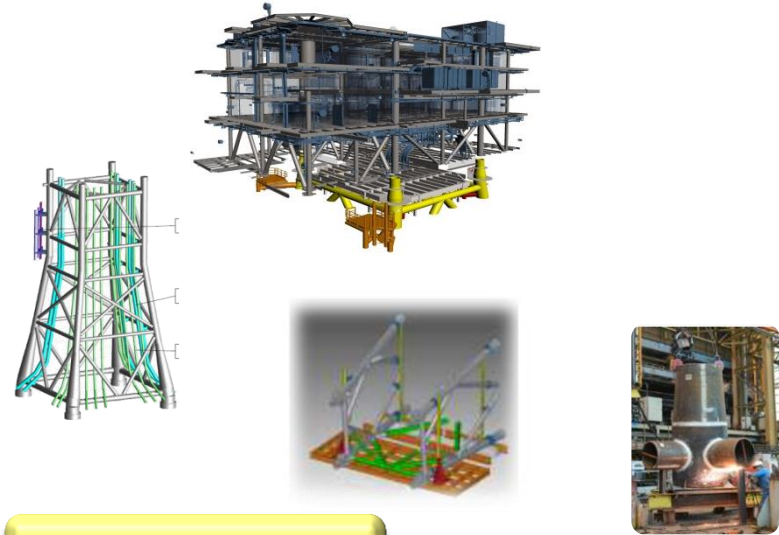


OFFSHORE ENERGY BUSINESS UNIT

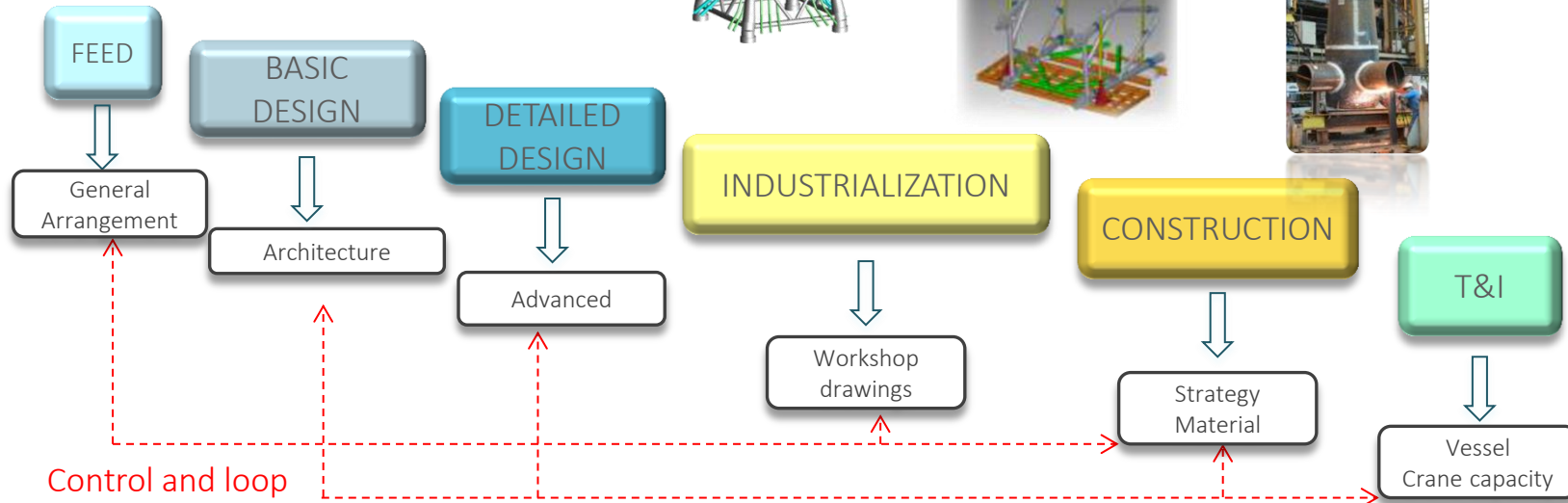
MARKET AND ACTIVITIES

Scope EPCI for:

- Electrical Offshore Substations
- Substructures and Foundations



All for one and one for all !



Efficient design by multi-disciplinary constraint integration

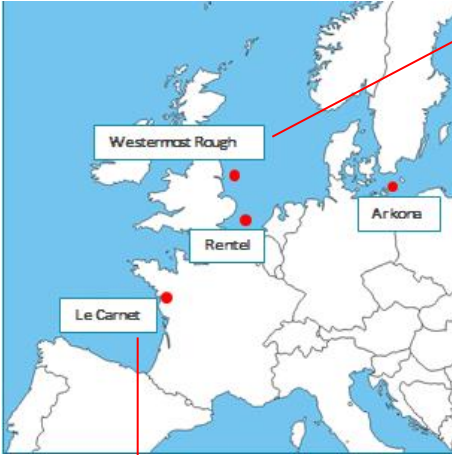
REFERENCES (1/2)

Delivery: 2014

Site: Westermost Rough – UK: OSS 210MW (1200t) + post-pilled jacket (1500t)

Client: DONG Energy

Scope: EPC



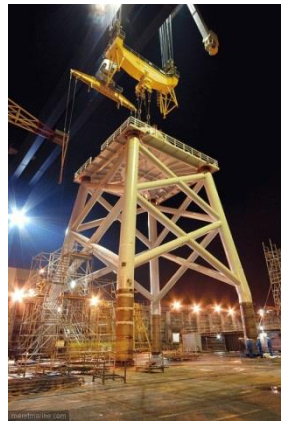
Delivery: 2011

Site: Onshore jacket prototype for Haliade

6MW Client: Alstom

Site: Le Carnet - FRA

Scope: EPCI



REFERENCES (2/2)

Delivery: 2018

Site: Arkona – GER: OSS 385MW (4000t) + pre-pilled jacket (1800t)

Client: EON, Statoil, 50Hz

Scope: EPCIM

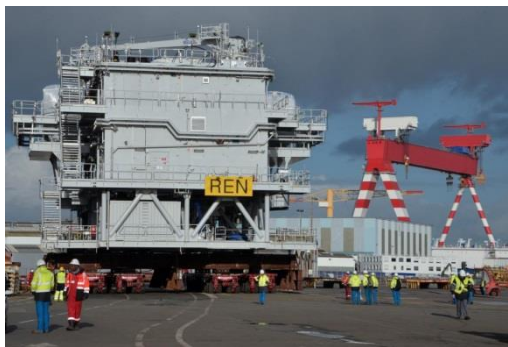


Delivery: 2018

Site: Renteil – BEL: OSS 309MW (1200t) + monopile (1600t)

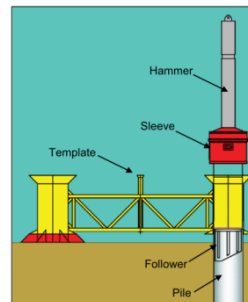
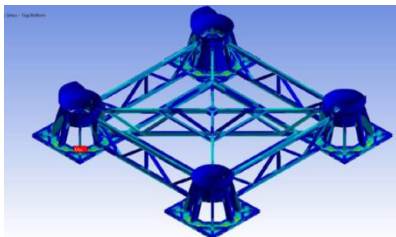
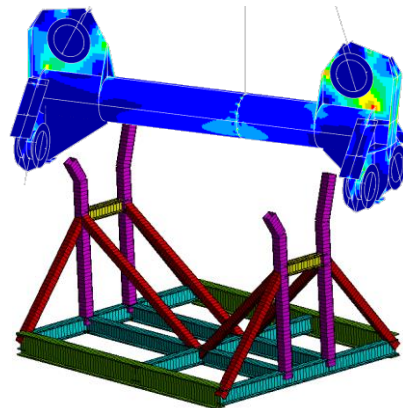
Client: Otary

Scope: EPCI

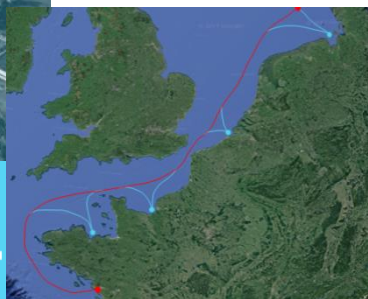
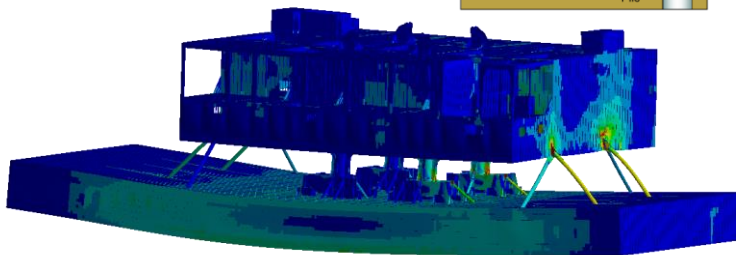


ENGINEERING AND FABRICATION OF INSTALLATION AIDS

- Lifting of topside → Spreader bar
- Pile driving → Template, follower



- Barge Transport → Sea fastening design



22 janvier 2018

COST REDUCTIONS BY INNOVATION AND DEVELOPMENT

R&D

- Project Partnership



- In House Development

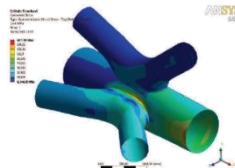




R&D PROJECTS	Product	Period	Subject
FONDEOL	Jacket	2010-2011	Comparison of various foundation types & tank trials
POSEOL	Vessel	2010-2011	Installation vessel
FONDEOL 2	Jacket	2011-2012	Environmental impact & monitoring
AG4	Jacket	2012	DNV certification of jacket concept
CHARGEOL	Jacket	2012-2016	Complex loading applied on offshore structure
SURFEOL	Jacket	2013-2015	Measurement and maintenance
ADUSCOR	Jacket	2013-2015	Corrosion protection
HYSMAR	Jacket, Tidal	2013-2014	Hydrodynamic modeling
APSTRAM	Jacket	2013-2016	HLE material
WATTEOL 500	OSS	2014-2015	DNV certification of OSS stress skin design
ORCA	Tidal	2015-2016	Tidal turbine foundation
FEOS	Floating OSS	2015-2017	Floater benchmarking and FEED
JACKCLASS	Jacket	2016	Fast track design of OSS jacket
OMDYN 1 & 2	Cables	2016-2019	Dynamic cable for floating structure
DIME	Environmental loads	2017-2019	MetOcean data and extrem loads modeling
JIP DNVL	Floating	2016-2018	Coupled analysis of floating wind turbine
ROS 3D	Pile	2017-2020	Soil FE modeling
MONOCLASS	Monopile	2017	Fast track design of MP
SEEOS	OSS	2017-2018	OSS standardization

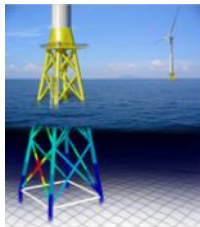
E.G. JACKET FOUNDATIONS

→ WTG



SCF

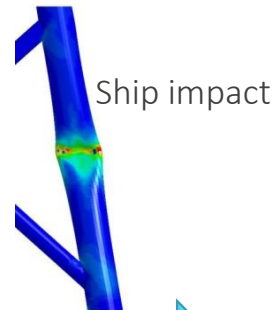
AG4
STX Concept certification (DNV)



AG3



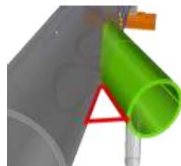
Clustering



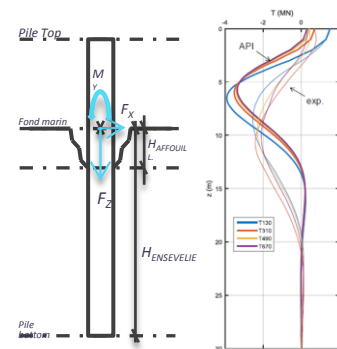
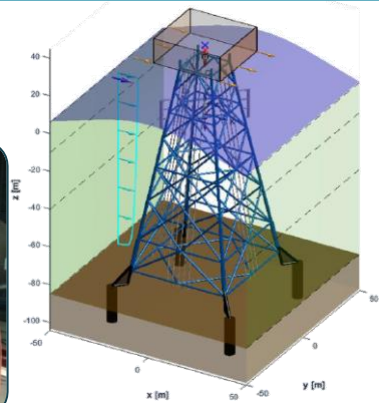
Ship impact

METHODOLOGY AND TOOL DEVELOPMENT: -20% primary steel

→ OSS



Fabrication constraints



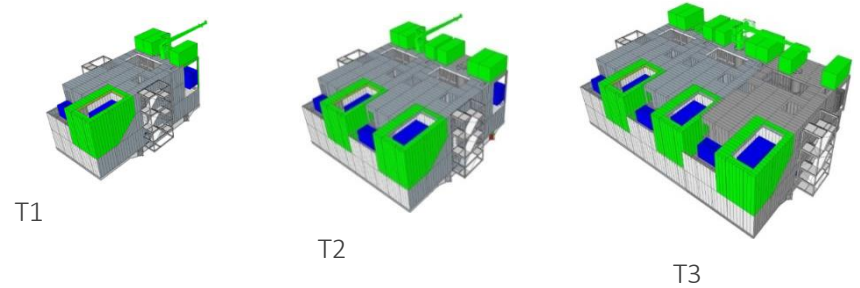
Pile design
(axial + lateral)

E.G. SEEOS CONCEPT (certification 2018) – PATENT PENDING

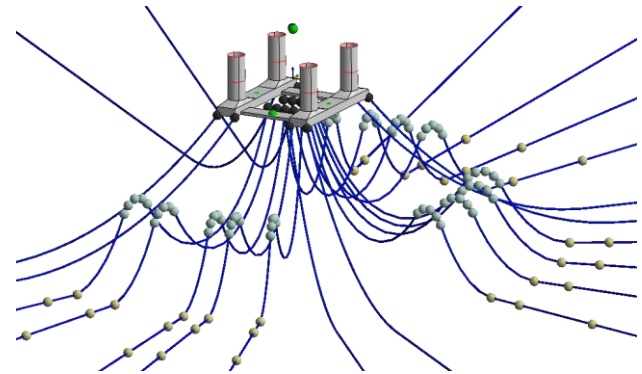
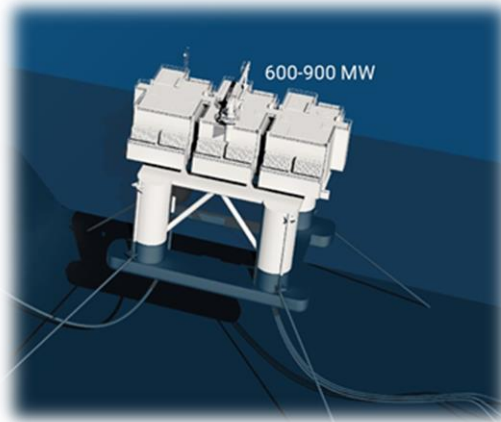
Standardize the “OSS function” and provide customized add-ons



-20% CAPEX, OPEX, Construction time

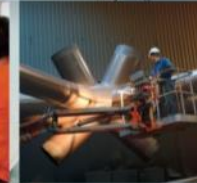


Semi-submersible concept





Thinking AHEAD



This presentation and the information contained herein are STX France's property, and they cannot be reproduced, used or communicate, even partially, without the written consent by STX France SA.