



London Offshore Consultants

Offshore Windfarm Construction: a marine consultant's view

Windfarm Offshore Forum - Copenhagen

19 May 2014

- Introduction
- Marine Warranty
- Reviews
- Approvals
- Weather
- Worries
- Foundations
- WTG
- Cables



- Over 300 professional staff including dedicated contract personnel
 - 20 nationalities
 - 12 languages
- Broad range of disciplines
 - Naval Architects
 - Master Mariners
 - Marine Engineers
 - Marine Civil Engineers
 - Structural Engineers
 - Offshore Engineers
 - Subsea & Pipeline Engineers



- Shipping
 - Marine Casualty Investigations
 - Salvage and Wreck Removals
 - Strength, Stability and Motions Analysis
 - Cargo Damage
 - Fixed Object Damage
 - Expert Witness
 - Loss Prevention Studies
 - Surveys, Inspections and Audits
 - Claims, Disputes and Litigation



- Energy
 - Marine Warranty Surveying (MWS)
 - Transportation and Installation Evaluation and Verification
 - Offshore Incident / Casualty Investigations
 - Surveys, Inspections and Audits



- Insurers
- Protection and Indemnity (P & I) Clubs
- Hull & Machinery (H & M) Underwriters
- Energy Underwriters
- Maritime Lawyers
- Ship-owners
- Energy Companies
- Banks / Ship Financiers
- Shipbrokers
- Governments





LOC

MARINE & ENGINEERING CONSULTANTS

Marine Warranty Surveying Renewables Energy (Oil and Gas)

*“The fundamental objective of the Marine Warranty Surveyor is to make **reasonable endeavours** to ensure that the **risks** associated with the warranted operations to which a Warranty Surveyor is appointed are **reduced to an acceptable level** in accordance with best industry practice.”*

The MWS is an independent consultant employed by the assured to carry out the following:

- Document Reviews
 - Design Specifications
 - Design Calculations and Drawings
 - Procedures
- Vessel Suitability Surveys
- Operations Approvals



Procedural Reviews

- Procedures contain the data and define facilities and the steps necessary to carry out an operation.
- Load-out / Load-in Procedures
- Anchoring Procedure
- Lifting Procedure
- Upending Procedure
- Towing Procedure
- Piling Procedures
- Laying Procedure
- Start up and Lay-down Procedure



At the right place at the right time !!

Design Specifications

- International Standards
- Project Specific
- LOC Guidelines

Design Calcs and Drawings

- Structural Analysis for load out, transportation and installation (lifting, launching, float-over, laying)
- Naval Architectural Analysis, Motions, Stability, Damage Stability, barge strength.
- Hand Calculations for pad-eyes, rigging etc..



Care and attention to detail are always important !!

Tugs
Barges
SSCVs
HLVs
Jack-ups
Shear Leg Cranes
Cable Lay Vessels
Cable Lay Barges
DSVs

Surveyor will Check

- Certification
- General condition
- Manpower
- Capability leading to suitability.



Is it really Suitable?!!

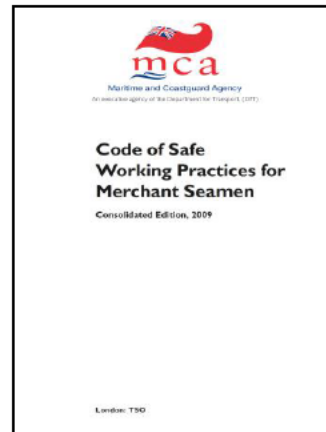
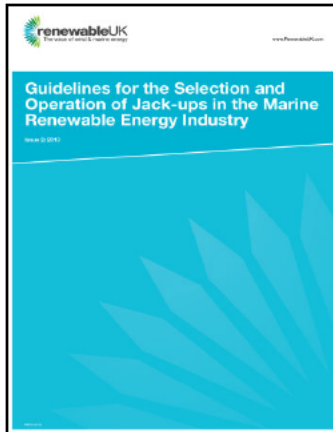
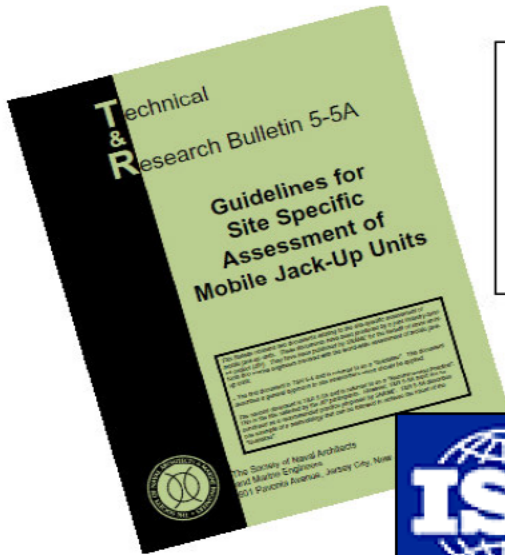
Critical operations require a Certificate of Approval:

- Load-out
- Sail-away/Securing
- Installation (lifting, launching, float-over, laying, trenching)

Certificates of Approval are normally issued prior to the commencement of an operation but some Underwriters also want them on completion of the operation

**Just lift and install
these 1400 panes of
glass !!**





OFFSHORE STANDARD
DNV-OS-H101

Marine Operations, General

OCTOBER 2011



Weather Limits - Calculation – Modeling

Refer to them in the CoA and Method Statement

Remember - Master always has the final say

MWS may set limits lower at the beginning and increase with experience.

Real vs. Contractual limits

- Performance
- Vessels specification
 - DP vessels very strong with current ahead , weak with current on the beam.
- Limited by vessel choice
 - positioning and jacking in 1.75 m Hs but AHT are small and work in 1.2m Hs
- Limiting exposure of assets
- Access



Swell

- Vessels rolling in beam sea
- Environmental study not showing low swells
- Therefore not expected in planning
- Therefore project significantly delayed



CAR insurance is based on :-

- accepting reasonable Risk
- avoiding claims

Underwriters, MWS Surveyors and Developers have to consider the **unknown**, the unexpected, the unconsidered and the ignored



The unexpected



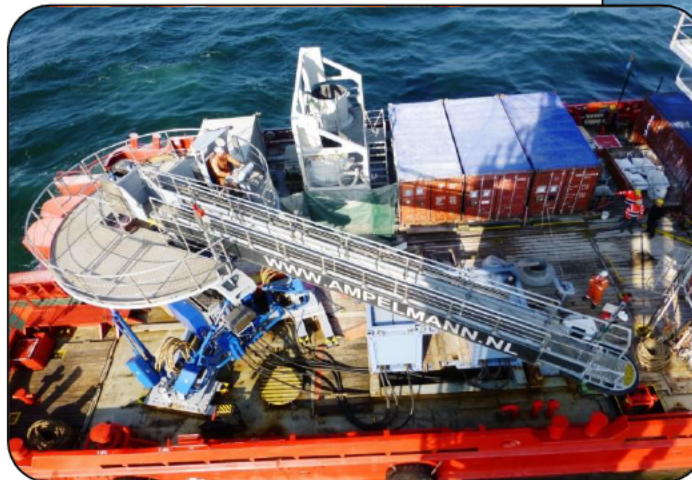
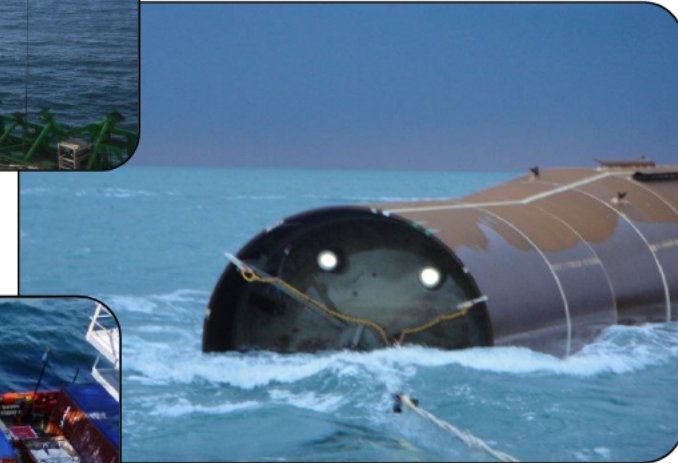
The unexpected



The unconsidered or the ignored



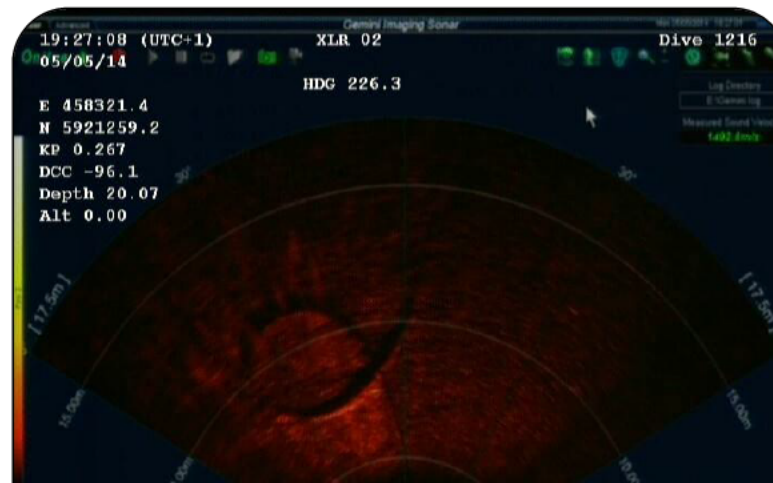
- Loadout
- Up-Ending
- Installation
- Transition Piece
- Access
- Navigation Hazard
- Cables



- Loadout
- Seafastening
- Installation
- Access
- Cables



- Planning
- Cable Pull In
- Cable Lay
- Cable Protection
- Post Lay Survey



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