

Foundation installation and the challenges the Industry is facing

...and how do we overcome them in a joint effort with our Contractors.

DONG Windpower targets

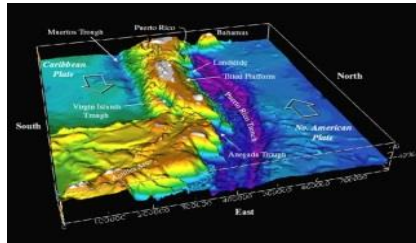
- Reduce the overall Cost of Electricity



- Reduce the LTIF and increase safety awareness



Foundation installation from A-Z



Non-negotiable boundaries "dictated" by DONG

- Offshore site location
- No. and type of foundation
- Foundation fabrication
- Time schedule – handover date
- Consent requirements
- Contract type – FIDIC
- Marine coordination compliance
- HSE–regime
- QA-regime
- Vessel inspections
- Possible specific free issue items eg vessels, feederport etc.

Foundation installation – technical challenges

- Wind farms going further and deeper offshore:
 - greater exposure to the elements during installation i.e. workability challenged
 - transits and logistics getting potentially more complicated
- Technology:
 - Jackets replacing MPs
 - Heavy MPs – distributing weight between MP/TP differently by introducing underwater grouting
- sites with soft soil
 - Compromised Jacking height
 - Penetration of the legs
- Pile grippers, hammers, seafastening
- Consent requirements
 - Noise mitigation

Cost drivers

...a mutual challenge to keep the industry going

- Risk distribution between DONG and contractor
- Contract – DONG intend to let the contractors provide the vessels
- Consequences for installation schedule overrun NOT acceptable due to the subsequent domino effect into the project – LD-regime? Bonus arrangements?
- Vessel demand/supply – DONG expect prices to be reduced
- Foundation type – MP vs. Jackets (pre-piled, suction buckets)?
- Weather – DONG vs. contractor risk?
- Installation vs. transport + installation?

LTIF and safety awareness

- Strong focus on LTIF reduction and increased systematic reporting.
- Safety is also about understanding and controlling the task at hand. This is a case of a method statement not being followed and while being under pressure of having to make progress

Foundation installation - DONGs approach to meet targets

- Clear concise tender process
- Standardizing the foundation design
- Open on-going monitoring and dialogue with the market to enhance initiatives that can increase safety and reduce costs to pave the way forward for the offshore wind industry.

HOW CAN WE COOPERATE AND BUILD WIND FARMS TOGETHER?