Offshore Code of Practice (OCoP)

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Agenda – Offshore Code of Practice (OCoP)

- Why an OCoP?
- Project organisation – German Market as Pilot
- Risk Registration Approach
- Submarine Cables
- Offshore Substation
- Offshore Windturbines
- Conclusion & Next Steps

Why an OCoP?

- Offshore wind industry young but fast growing sector
- Trend towards larger and more complex multibillion dollar offshore wind farm projects
- EWTC[1)] identified substantial project pipeline as a challenge & business opportunity alike; launched OCoP initiative in 2010
- Analogies to & lesson's learnt from JCoP for tunnelling risks

Goal: Develop a best practice paper on state-of-the-art risk management practice for construction of offshore wind farms jointly with representatives from all stakeholder involved in the realization of such projects.

- Ensure risk is **transparent** to all parties to a project
- Ensure all parties adhere to **same risk philosophy** at every process stage
- **Mitigate risk exposure** of all parties to a project
- **Keep risks insurable** in the long term (pro-active approach)

[1)] European Wind Turbine Committee (EWTC) comprises of European insurers and reinsurers actively involved in the wind energy sector

Project Organisation – German Market as Pilot

Sponsor

European Wind Turbine Committee (EWTC) and German Offshore Wind Energy Foundation

Project management

- **Harald Dimpflmaier, Swiss Re Europe (project coordinator OCoP)**
- **Stefan Gumpp**, Allianz Germany (WG 1: Substation, Cable Laying)
- **Georg Englert,** HDI-Gerling (WG 2: Windturbine, Tower, Foundation)
- **Michael Klug**, Munich Re (WG 3: Offshore Erection, Marine Warranty Surveyor)

Project members

More than 90 representatives in 10 expert teams:

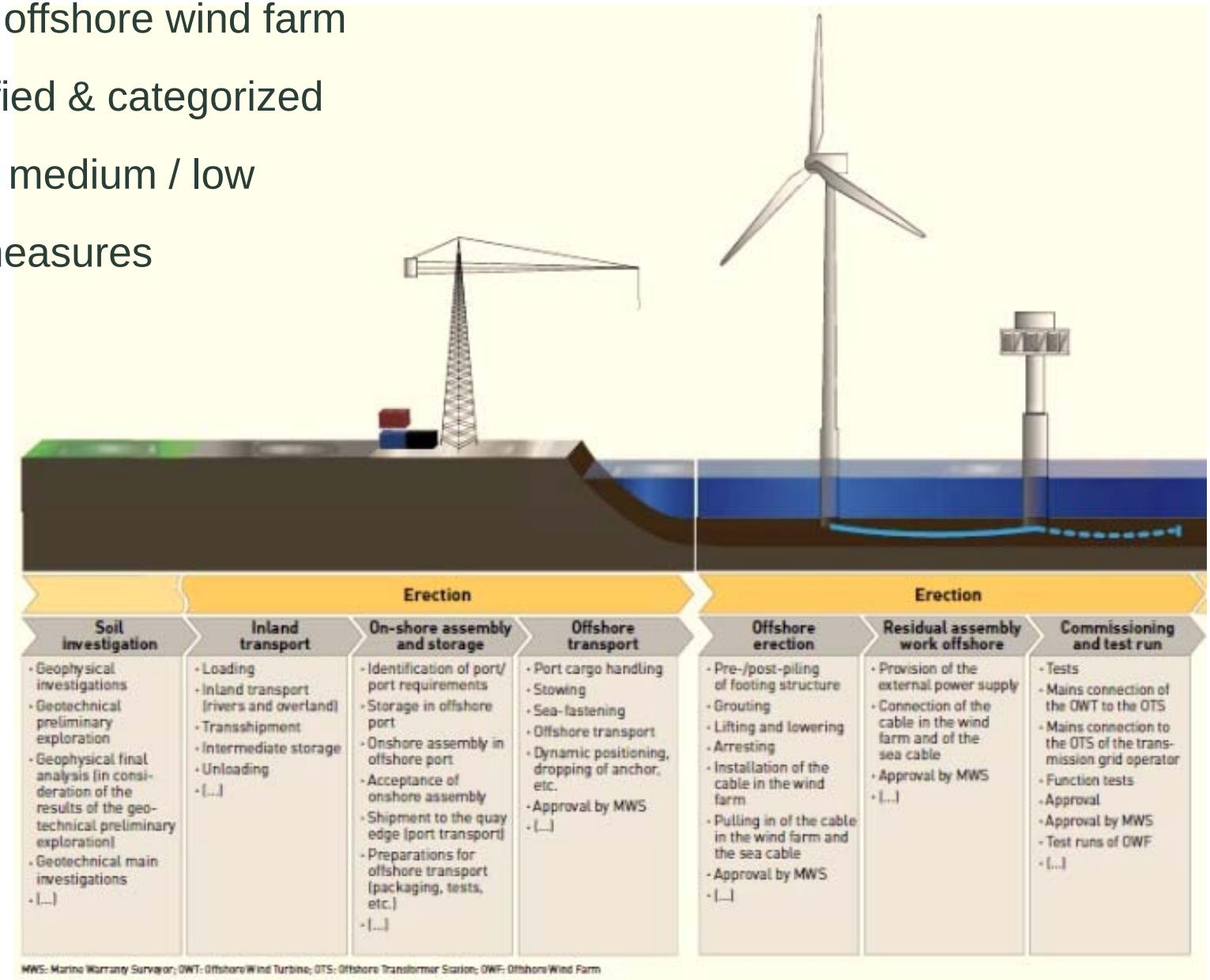
- Insurers, reinsurers, insurance brokers
- Manufacturers, operators, developers
- Investors, banks, consultants, certifiers, energy providers
- Shipping companies, technical surveyors, Marine Warranty Surveyors (MWS)

Support & Facilitation

German Insurance Association (GDV)

Risk Registration Approach

- Building a virtual offshore wind farm
- 500+ risks identified & categorized
- Very high / high / medium / low
- Risk mitigation measures
- 66% down to 6%



Submarine Cables

Table 1: Distribution of the potential risks of the operations required to install the cables in the wind farm examined in the OCoP (WITHOUT and IN consideration of protection measures)

Potential risks	Potential risks of the examined operations w/o consideration of protection measures		Potential risks of the examined operations in consideration of protection measures	
	[number]	[percent]	[number]	[percent]
low risk	5	15	15	35
medium risk	5	15	13	30
high risk	10	29	5	12
very high risk	14	41	1	2

- Cable crossings with existing cables / pipelines; damage due to bending radii
- Cable damage during trenching/ploughing works; damage to J-Tubes (design)
- Cable laying – planned versus actual (communication w/h jack-up vessel op's)
- DSU / BI severity risks related to export cable (redundancy levels)
- Transportation from manufacturer to site (recent loss of vessel incl cable)
- ~2/3 of total loss amount in offshore wind triggered by submarine cables

Offshore Substation

Table 2: Distribution of the potential risks of the operations required to build the offshore transformer station examined in the OCoP (WITHOUT and IN consideration of protection measures)

Potential risks	Potential risks of the examined operations w/o consideration of protection measures		Potential risks of the examined operations in consideration of protection measures	
	[number]	[percent]	[number]	[percent]
low risk	6	3	103	54
medium risk	32	17	74	39
high risk	100	53	13	7
very high risk	52	27	0	0

- Transportation to site; heavy lift (role of Marine Warranty Surveyor!)
- Subsoil conditions / foundations for substations
- Explosion / fire hazard due to lightning / short circuit or failure of fire protection / supression systems
- High severity exposure related to DSU / BI (eg Nysted Offshore Windfarm)
- CBI exposures; built-in redundancy levels

Offshore Windturbines

Table 3: Distribution of the potential risks of the operations required to build the offshore wind turbines examined in the OCoP (WITHOUT and IN consideration of protection measures)

Potential risks	Potential risks of the examined operations w/o consideration of protection measures		Potential risks of the examined operations in consideration of protection measures	
	[number]	[percent]	[number]	[percent]
low risk	15	5	126	43
medium risk	117	40	156	53
high risk	142	48	13	4
very high risk	21	7	0	0

- Subsoil conditions / foundations / transition piece (eg grouting issue)
- High value concentration at on-shore storage & pre-assembly areas
- Vessel operation (owned vs third party; weather conditions; standby times)
- Blades workmanship, handling, installation (logistics due to dimension)
- Heavy lift of nacelle & tower (dimension)
- Experience of newly emerging manufacturers, contractors; no turnkey contractors yet => interface management

Conclusion

- Highly complex projects that require many different aresa of expertise
- Interface management and communication /coordination amongst various project parties is a critical success factor
- OCoP to assist in systematically identifying risks across all projects phases and risk mitigation measures to help reducing loss potential

Next steps

- Practical application of OCoP through benchmarking of projects to specific risk assessment Risk Management measures (project owners / insurers)
- Living document – feedback 'from the field' – updates
- German and English version available in September 2014 (GDV & IMIA)
- Rollout to other markets (UK – LEG Group?)
- Discussion about first experience with the implementation in 2015 (EWTC and German Offshore Energy Foundation)

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