Webinar Q&A - Marine structures in the enviroment

Topic		
Webinar: Structures in the Marine Environment		
#	Question	Answer
1	Which wave spectrum is most applicable when designing for FOWTs along the Australian Coastline? I.e PM, JONSWAP	
2	What are the challenges faced in operation and maintenance of Offshore Wind Farms?	Hopefully I answered that during my presentation for the environmental & social/socioeconomic challenges (ie commerical fishing industry; visual resources; tribal/cultural; protected species).
		Appreciate your reply.How do you assess the performance of the structures at regular intervals for coastal storms?
3	What are the potential consequences of underwater electromagnetic fields generated by offshore wind turbines on the behavior and navigation of marine organisms, particularly those with sensitive electrical sensory systems?	The impact of sonar-type surveys for wind turbines on marine mammals is assessed and considered as part of the planning and permitting phase. Noise impacts of operations on marine mammals is also assessed. A monitoring plan helps address and maintain operations. For example, during seasonal migration that may be with the impact range, monitoring can help minimize or avoid impact by scheduling operations in consideration of the migration.
4	How will the artificial structures of offshore wind farms alter the natural flow of water and currents, potentially affecting coastal processes and nutrient distributions?	The affect depends on the several factors, such as proximity to shore and seasonality. Near to the structure, or system of structure will affect laminar and turbulent flow characteristics. But this essentially dimishes with increased distance. For nutrient distribution, land based input is a factor consider and what the limiting nutrients/elements are in the area and water temperature.
		Thanks, Aja, for the prompt answer. I was specifically thinking about the impact near the structure. If the structure is close to the shoreline in shallow water, it could have a more significant impact, and one must find ways to control and protect coastal processes...
		From a natural resource perspective, in general, installing structures create habitat, refuge, hunting and foraging area, and substrate for organisms to recruit to, attach and grow on. The type of installation near shore will change the way that wave energy is dissipated. Ultimately, this is a multidisciplinary discussion with natural resource and engineering, in my opinion.
5	What is the average life span of Offshore Wind Turbines	live answered
6	I have very limited knowledge of these offshore wind farms. From what I have learned these wind farms are very expensive to move, construct and sustain. Are these farms economically viable? Would these farms disrupt ocean life? Thank you for your time.	The Levelized Cost of Energy (LCOE) is decreasing as we are able to manufacture and install more - think economies of scale. We have a ways to go but the LCOE has improved (decreased) significantly in that timeframe i mentioned earlier (particularly since 2010).
7	How do you combine wind energy with other forms of energy?	Logistically I think this is still to be determined; we are discussing conceptually at this point. Matt may know more about the physicality of this, but the intent, as least with hydorgen, is that offshore wind is the energy used in the hydrogen processing (hydrolyzer), as least as far as I know (not an expert on this!).
8	the image presented by Kim showed the energy supply to land from the wind plant above the waterline; that is very restrictive and ontrusive to everybody. Would it not be better for thos eservices to be layed on the seabed? or must they be above the waterline for practicality?	Apologies for the confusing graphics; all the cables are buried.
9	During the installation of a monopile into the sea floor, are there any controls needed for the sea bed disturbance i.e., suspension of sand/silt into the sea water.	Yes, there are. Matt may be able to give specifics better than I can, but I can answer that yes there are controls to minimize impacts.
10	obtrusive rather (mispelt)	
11	Do jackets have to be constructed on land and taken to sea to install in one piece?	The answer (from theBD guy) is sort of. A jacket is largely fabricated onshore. It is then brought to its ffshre location and piles are driven through the legs to afix it to the soil
12	With these larger turbines are deeper depths able to be achieved without shifting to floating?	Yes, up to a certain point. A decade ago general wisdom was that you could monopiles only up to 30m depth. With the increase in turbine size we are now looking at 60m water depth for monopiles
13	what is a booey?	buoy?

		Buoy
14	Matt, can you describe the problems with variable seabed depths and monopile structures?	We actually design each single monopile to the specific water depth for that location. We also do seabed mobility studies to determine the expected max and min depths based on seafloor migration over the design life
15	Are we considering the impact of the different amounts of minerals (and the increased mining to extract these minerals) used to construct wind turbines and related gray structures on long-term socio-economic and environmental issues? And how they are going to contribute into climate chnage impacts?	At this point, our analysis does not extend that far back into the supply chain. We are looking forward at the possibilities of recycling material used, but that is newer technology as well.
16		ahhh BUOY..... I have never heard of a booey, I thought he was atlking about something else?
17	Can available/unused oil and gas platforms be used for OWT?	I dont think we are looking at actually reusing the O&G plaforms themselves (very different dynamics to put a tower on top of the platform); however 'repurposing' of technical skills in the O&G sector is a very big part of the offshore wind industry (eg engineers, manufacturing, etc.). There is a possibility/discussion of repurposing O&G infrastructure (pipelines) for things like hydrogen production.
18	How do you assess the scour depth for different site conditions ?	We do specific scour analysis site and design the scour protection, usually several layers of rock of different sizes to protect the base of the monopile.
18	How do you assess the scour depth for different site conditions ?	Are the designs finalised based on any physical modelling?
19	Accidental Limit State- from your experience, are these forces ever governing the structure in terms of failure mode?	Typically no. As we now get into service vessels with dynamic positioning and backups the ALS is almost never the design case. We do of course have to analyse it.
19	Accidental Limit State- from your experience, are these forces ever governing the structure in terms of failure mode?	What does seem to be the governing failure force?
20	thank you	
21	West coast of NZ? Re tool the O&G industry out of taranaki?	-
22	What would be the impacts of cables vibration on sediment scouring near bed and what are the potential Tsunami impacts on turbines?	-
23	Hi, do the benefits of the floating and further offshore structures outweigh the costs involved in the substations and cables needed over a greater distance. For example, is there a loss of efficiency/engery over a greater distance?	-
24	it would be good to understand how much interruption, if any, to undersea currents would occur by pylons??? would there be any????..... presumedly the wind pylons could also initiate the natural build of an artificial reef system too?	-