VARD 4 SERIES - SERVICE OPERATION VESSEL SIMULATION Q&A

Q: Chad, can you tell the viewers if this is just an animation or something more?

A: The "pretty picture" aspect of this is actually secondary. This initiated because SOVs drove us to expand our seakeeping analysis beyond the capabilities of our off-the-shelf tools. We developed new transfer functions to predict the gangway slew, luff, and extension. We then created the animation so we could visually check that the math we'd implemented was moving the gangway correctly. The motions of the vessel, gangway, and waves in the animation are all derived directly from our seakeeping analysis.

Q: I'm constantly telling clients we put a lot of thought and effort into "simplifying" the hull form for production purposes. In this hull, has the simplification negatively affected performance and why?

A: SOVs are an excellent vessel type for which simplifying the hull form can yield benefits in both producibility and performance. The shift to a producible chined hull form provides more damping to the wave-induced motions, resulting in better performance at the wind park. These vessels don't spend as much time in transit as many others, but we still run computational fluid dynamics on the hulls to ensure the chines are well-aligned with the flow and to minimize resistance penalties from features like tunnel thrusters.

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Q: Is this a typical analysis or was special consideration given into putting the parameters together?

A: This is showing one of the more benign conditions that we'd typically analyze. Although operators would prefer to avoid more dangerous situations, we also focus on analyzing performance in the drift-on condition, in which the weather pushes the vessel towards the turbine. It is vital that we ensure that the vessel be able to continue to operate safely if conditions drive the captain to choose a drift-on configuration, and bad luck strikes in the form of a fault in the system while operating in that vulnerable condition.

Q: Why is it important to simulate the interaction between the hull and gangway motions?

A: The gangway connection to the turbine is one of the most important aspects of SOV operation, enabling efficient crew and equipment transfer to the turbine. For vessels that are intended to operate in demanding conditions such as the North Atlantic, it is essential that this key capability remain available as much as possible. Our design process focuses on accurately predicting this and other key aspects of performance to ensure operators will have an effective vessel with minimal downtime.

Q: If I am a client, what does this simulation tell me?

A: The "blooper" you may see near the beginning of the animation is a brief emergence of the bow tunnel thruster from the water; we track the frequency of these types of events to ensure their performance impact is negligible. The simulation also shows that the motion stabilization systems on the vessel are successful in yielding low vessel and gangway motions for technician comfort, safety, and a dependable gangway connection. Overall, this gives confidence that, even when going beyond the normal capabilities of off-the-shelf toolsets, Vard Marine is able to provide reliable engineering.