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Delta Marine Uses ANSYS Engineering Simulation

Turkish shipbuilder minimizes risk and maximizes performance well before launch day

SOUTHPOINTE, Pa., July 20 -- ANSYS, Inc., a global innovator of simulation software and technologies designed to optimize product development processes, today announced that Delta Marine Engineering Co., a merchant marine designer based in Turkey, uses Simulation Driven Product Development from ANSYS to optimize ships that transport cargo to all points of the globe. The company analyzes its designs with software from ANSYS to identify and correct troublesome vibration, in order to comply with international standards as well as ensure the safety of the crew and a long life for the ship.

One of the most basic tasks that marine engineers face is eliminating undesirable vibration. Each ship has natural frequencies dependent on the design of its structure, which includes parameters such as size and shape as well as the materials used. In addition, there are forcing frequencies that act upon a ship, most often generated by components that operate at different frequencies. As the propeller moves the water, for example, it exerts forces on the back of the ship, and these forces are large enough that they can cause vibration, particularly if they excite one of the structure's natural modes of vibration.

An ocean-going capesize bulk carrier, which can carry bulk cargo such as iron ore or coal up to 180,000 tons, is continuously slammed. The propeller alone can exert loads of 10 tons to 14 tons, and the engine can generate additional moments up to 200 tonmeters. Vibration in marine applications is especially complex because it also involves the behavior of the structure as it passes through the water. This fluid structure interaction (FSI) can fatigue the hull's components and cause vital equipment to malfunction.

"Simulation analysis gives our engineers insight into the complexities of these interactions," said Dirim Sener, planning director of Delta Marine Engineering Co. "Using ANSYS technology, our engineers try to correct problems by modifying the ship during the design stage -- instead of discovering vibration problems after the ship is launched." He added that changes made after launch could cost millions of dollars, while changing the underwater form of a ship in the design stage can be done at almost zero cost. "Engineers also have much more freedom when making design changes in the early stages."

Delta Marine engineers use software from ANSYS to calculate pressures induced by the propeller on the aft of the ship as well as the loads generated on the propeller shaft. If vibration values do not meet international standards, sometimes expensive changes must be made. By identifying vibration problems in the early stages of the design process, Delta Marine can make alterations such as adding pillars or strengthening structural components, or changing the propeller, revolutions per minute of the crankshaft, or number of blades in the propeller. Then, engineers can update the model to determine the effect of the changes on vibration displacement and velocity.

"The marine industry is challenged to develop and produce new designs at an accelerating pace. Designing ships is not a straight-forward process: The changes are frequent and

prototyping can be quite expensive. Delta Marine has shown how Simulation Driven Product Development can be extremely effective in designing vessels that mitigate risk -- helping engineers make critical decisions throughout the design process," said Dipankar Choudhury, vice president of corporate product strategy and planning at ANSYS, Inc.

Delta Marine also uses ANSYS technology to evaluate the structure and cargo tanks of ships against worst-case load scenarios involving forces exerted by the tank's contents against the tank itself. For example, the design and construction of sulfur- and bitumen-carrying tankers is complicated by complexity of the cargo tanks, which could either be built independently or as part of an integrated structure.

About Delta Marine Engineering Co.

Founded in 1996, Delta Marine Engineering Co. provides engineering and consultancy services for the design of various types of ships including general cargo ships, container ships, oil and chemical tankers, passenger ships and ferries, yachts, and navy ships. The company's services include basic and detail design, product engineering, advanced engineering analyses, project and feasibility analyses, consultancy and control engineering services and software development. With its vast ship design experience, it is known as a leader in the field. For more information, visit www.deltamarine.com.tr.

<http://www.hpcwire.com/industry/manufacturing/Delta-Marine-Uses-ANSYS-Engineering-Simulation-51260067.html?page=1>

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