

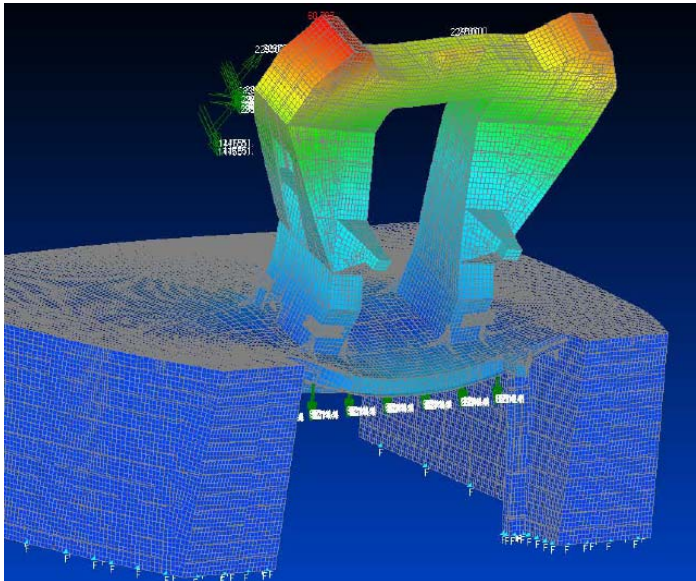


Marine Case Study (Marine Design and Operations, Inc. – Aft Stern Ramp)



Marine Design and Operations, Inc. (MDO) is a marine architecture, engineering, and consulting firm with twenty five years of experience in design for containerships, cargo vessels, barges, and offshore structures. A project list is on their website at www.mdoinc.net.

MDO was selected to do the structural design to equip the vessel, *MV Cape Rise*, with a new, 280-ton, deployable, aft stern ramp that would enable fast “roll on-roll off” loading of vehicles and cargo. The project made it the first in its class with this capability. The \$4 million project involved replacing a small, fixed ramp with a mammoth, hydraulically operated ramp that slewed both port and starboard. A notable component of the project was the monumental 90-ton king post that served as the path for the single strand cable to lift, deploy, and slew the ramp. MDO used NEi Nastran for analysis of all the vessel reinforcement structures and the new king post. One of the models MDO created consisted of the vessel stern section and kingpost including all internal girders, stiffeners, web frames, decks, and longitudinal bulkheads. The model had over 20,000 elements when meshed in a 6 by 6 grid.



MDO decided to use NEi Nastran FEA over traditional first principal structural analysis and pure ABS rules in order to optimize the design so they could achieve major cost savings in material and construction time for their customer. FEA enabled this design optimization in two ways: 1) it could account for the stiffness contributions from all structural members -- from the aft end of the vessel to the upper, lower, and main decks, and 2) von Mises stresses could be calculated and used for designing to higher allowable stress than ABS rules. In addition, MDO benefited in reduced analysis and engineering design time. NEi Nastran was selected after careful inspection of its capabilities and considerations of industry usage. Ease-of-use, and powerful productivity features like Automated Surface Contact Generation (ASCG) and Automated Edge Contact Generation (AECG) proved to be highly useful tools for the shell-like structures typically found in ships, especially compared to typical FEA software. Plus, the American Bureau of Shipping uses Nastran as the backbone structural analysis tool for their SAFEHULL software.

NEi Software, Inc. is aggressively focused on commitment to the customer. Detailed documentation, customized on-site training, and comprehensive technical support ensures that you will see immediate return on your investment.

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