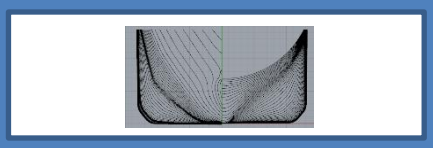
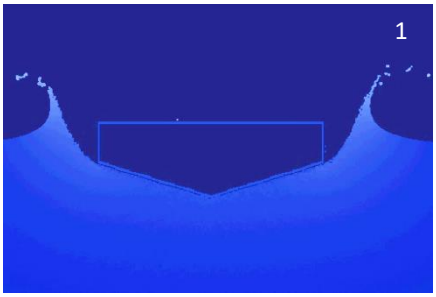


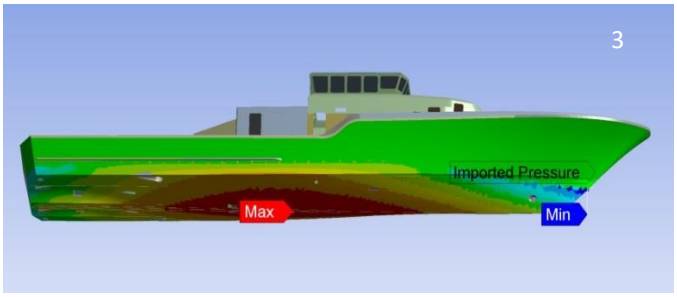
SEAKEEPING AND MOTION ANALYSIS

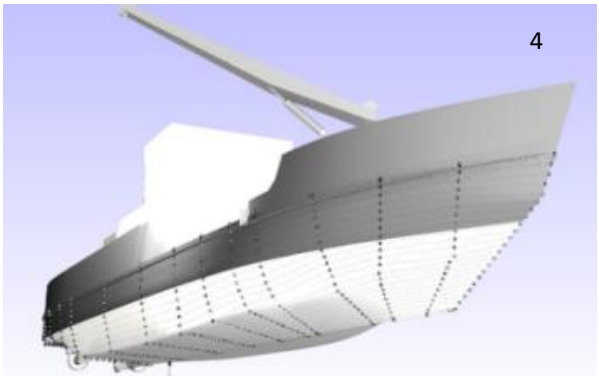
Maine Marine Composites

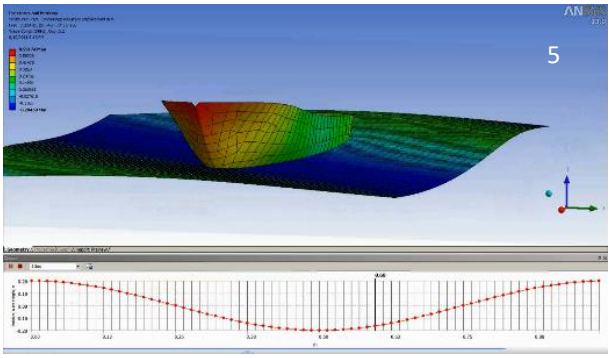


Engineering…

for the Marine Environment







The ocean environment is challenging in every way. MMC can reduce your risks by analyzing your boat, ship, mooring system, energy converter… any system you need to deploy in the water.

Photo Credits: (1) Smoothed Particle Hydrodynamics simulation of vessel slamming. (2) Arctic Challenger barge. (3) FE model of 43m cutter. (4) CAD model of US Coast Guard buoy tender. (5) Motion analysis of sport fishing craft.

MMC specializes in motion prediction for ships and platforms, advanced hydrodynamic analyses, and mooring system design and simulation. Our engineering staff has decades of experience with design and analysis of ships and offshore energy systems, and has successfully completed diverse and challenging projects for many of the most highly regarded offshore and ocean energy companies.

Sample Projects:

- Maine – Mooring and seakeeping response – tidal and river current energy converters.
- Motion analysis on Arctic Challenger oil spill recovery vessel
- BSEE/BOEM – Fatigue analysis of offshore floating wind mooring systems
- Scotland – Simulation and mooring system analysis for barge-transported road segments for Firth of Forth replacement crossing bridge

Specialized Services:

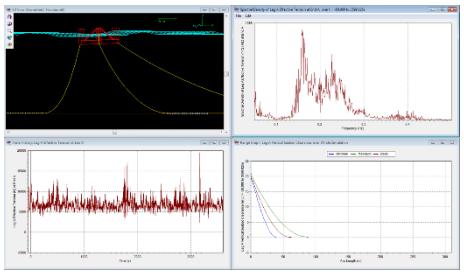
- Advanced Hydrodynamics Analysis using CFD, ANSYS Aqwa
- Finite Element Analyses of complex structures and materials
- Mooring System Design and Analysis using OrcaFlex, Aqwa with Cable Dynamics
- Ship and Barge Seakeeping and Stability Analysis using Aqwa
- Analysis and Simulation of Complex Marine Systems using multi-body simulation in OrcaFlex

Meeting Customer Needs, Exceeding Customer Expectations

We offer each customer the right mix of expertise, performance and price. Our staff has expertise in marine, civil, electrical, software and aerospace engineering.

Our software analysis tools are "best in class," selected to give you the accurate answers you need on a timely, cost-effective basis:

- ANSYS Design Modeler, Rhino3D, MultiSurf, SpaceClaim
  - CAD/CAE models of ocean platforms, hulls, wave and tidal energy converters
- ANSYS-Aqwa with Cable Dynamics
  - Potential flow (Radiation/Diffraction) analyses
  - Determine wave loads, Response Amplitude Operators (RAOs)



- Orcina OrcaFlex
  - Nonlinear finite element mooring model in time domain
  - Coupled with FAST to Analyze Floating Offshore Wind Turbines (FOWT) hydrodynamics including platform, turbine, moorings
- ANSYS Structural Professional
  - FEA of complex structural systems
- NREL FAST and WECsim
  - Simulation of Wave Energy Converters and controllers

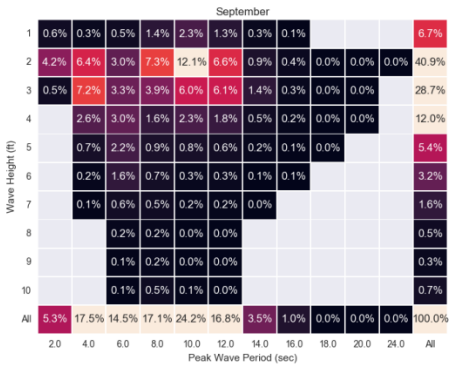
Vessel Hydrodynamics

Understanding the response of your ship in a seaway can make the difference between the success or failure of your project. MMC has conducted motions analyses of vessels and offshore systems for a wide range of industries, including:

- Oil and gas
- Offshore renewable energy
- Cargo transportation
- Passenger ferries
- High speed patrol craft

Our engineering staff has analyzed vessel motions and wave excitations to study hydrodynamic feasibility, loads and accelerations, slamming, seasickness, and spectral fatigue.

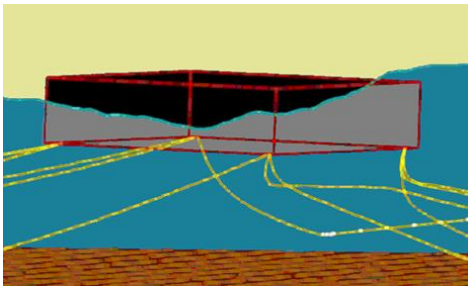
Using hindcast and other forecast data MMC can help you select the appropriate meteorological and metocean operating and survival conditions for your vessel.



By combining seakeeping analyses with metocean information, MMC can predict the operational availability of your barge or ship for specific missions.

Motions in Demanding Environments

MMC can verify that your ship can handle the seaway for which it was designed, and determine the bounds of operation for your vessel.



MMC has assisted a number of naval architecture and operating companies to ensure that their vessels and cargo can survive a dynamic ocean environment.

Adding MMC to your project team will help you to make sure that your vessel is developed and analyzed successfully and that it arrives safely at its destination.

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