

CDI Marine



Government

United States

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ANSYS®

ANSYS® CFX®

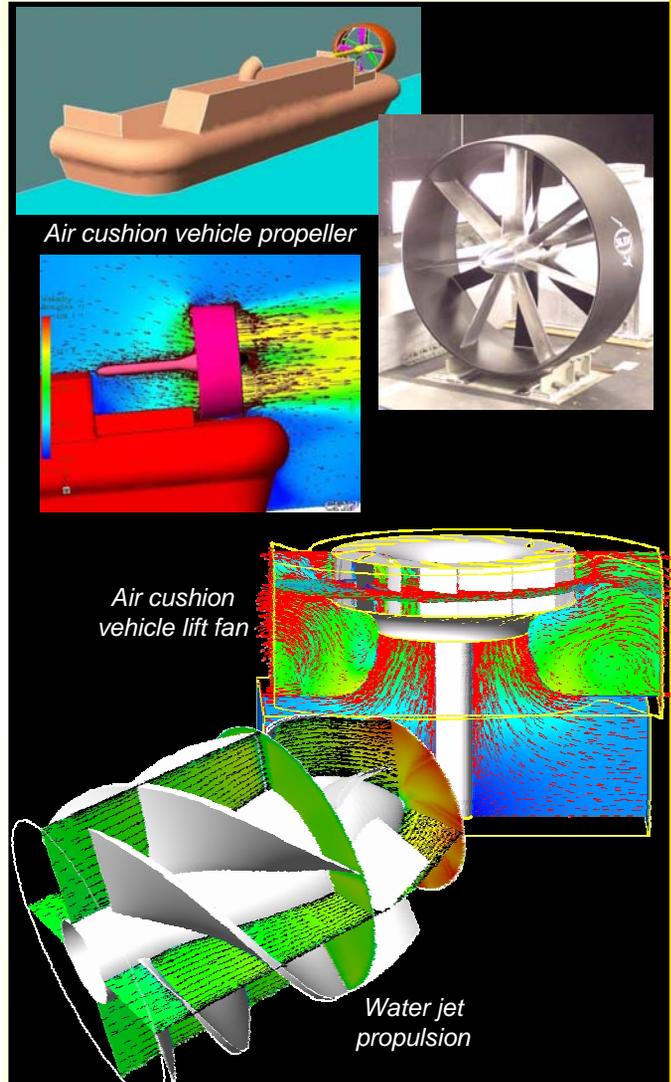
Overview

CDI Marine Systems Development Division (formerly Band, Lavis & Associates (BLA)) specializes in marine technology research and development. BLA was founded in 1977 as a privately-owned business and was acquired by CDI Marine Company in 1998. The Systems Development Division works extensively in the design, testing and development of conventional and high-performance ships, craft and marine systems, with core competencies in naval architecture, hydrodynamics, structural design, water-jet propulsion system design, air cushion vehicles, concept exploration, and model construction, model testing and full-scale trials.

Testimonial

"We have used ANSYS CFX for several important projects, primarily related to turbomachinery design applications. Without CFX, there was no way to predict or analyze the impact of the flow conditions that would be encountered with any degree of certainty. With CFX, one can obtain an understanding of the effects of various conditions on the flow fields and literally push the state-of-the-art for many design cases. Time and later testing has demonstrated ANSYS CFX to be a reliable and indispensable tool in our design and analysis efforts."

John Purnell
Senior Engineer



Air cushion vehicle propeller

Air cushion vehicle lift fan

Water jet propulsion

Challenge

A new ACV design required propellers and lift fans capable of carrying twice the payload of the existing design.

Efficiently simulating multiple design iterations requires simulation tools that can communicate directly with our blade design system.

When running scores of design iterations, all available CPU resources must be utilized in order to maximize throughput.

Solution

CFX-TurboGrid reads the geometry definition for the lift fan, propellers and stator vanes directly from our design system. A high-quality all-hex mesh is created nearly automatically, ensuring efficient computation on similar grids for each design iteration.

The ANSYS CFX flow solver has been shown to converge reliably and rapidly for these multi-frame analyses. Results have been found to agree closely with experimental tests.

Benefits

Using CFX-TurboGrid and ANSYS CFX, CDIM generated scores of potential designs while iterating to an optimized design solution. This process took orders-of-magnitude less time than would have been required to design, build and test just one design alternative using conventional methods.

By using a cluster of PCs, run time is reduced and larger problems with more detail can be tackled efficiently.