

Fluid Equipment Development Company

Fast-track Development of a New Pump-Turbine Energy Recovery Unit with Stringent Efficiency Requirements



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Fluid Equipment Development Company (FEDCO) is a leading designer and manufacturer of advanced high-speed liquid-driven turbochargers and centrifugal pumps for reverse osmosis desalination services. FEDCO competes on a global basis against some of the largest pump manufacturers in the world.

TECHNOLOGY USED

ANSYS® Workbench™, ANSYS® CFX®, ANSYS® DesignModeler™

CHALLENGES

FEDCO's main market is the supply of high-pressure pump and energy recovery equipment for seawater desalination. A combination of water shortages and growing energy costs has spurred rapid market growth and also induced the entry of major international competitors. FEDCO needed to develop larger and more efficient models of its established hydraulic energy recovery units to sustain its growing market share. However, the expense and time involved in building and testing large prototypes were not acceptable.

FEDCO had less than four weeks to develop a highly optimized fluid design before committing to final pattern and casting designs. The main challenge was that FEDCO had just one chance to get the hydraulic and casting design right, so every resource was devoted to that objective.

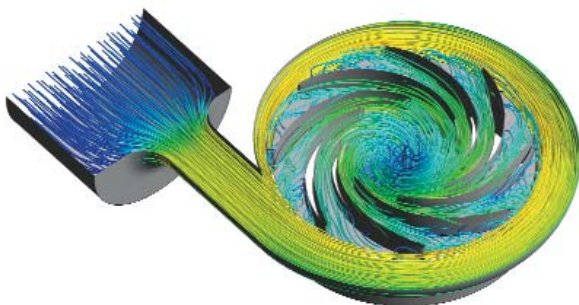
ENGINEERING SOLUTION

- The ANSYS Workbench platform was mastered by the existing engineering team in a matter of several weeks, and ANSYS CFX software was used to evaluate the hydraulic performance of many prototype designs
- ANSYS Workbench smoothly integrated with solid models developed in SolidWorks® CAD software as well as FEDCO proprietary hydraulic design software
- FEDCO verified the accuracy of the analysis using ANSYS CFX by comparing predicted performance of existing designs with actual performance
- The rapid utilization of technology from ANSYS was made possible by excellent on-site training tailored to FEDCO's specific objectives

BENEFITS

- Hydraulic design improvements developed within ANSYS Workbench allowed FEDCO to meet the efficiency requirements, which exceed extrapolated values of existing designs by approximately 6 percent
- Ongoing analysis using ANSYS CFX has been applied to the entire FEDCO product line, resulting in efficiency gains ranging from 4 to 7 percent
- A side benefit was a substantial reduction in operating noise levels of up to 15 dB

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Streamlines shown in cross section through energy recovery turbine of HPB

COMPANY INFORMATION

Country: U.S.A.

Industry: Industrial Machinery & Equipment



www.fedco-usa.com

“ANSYS Workbench has allowed FEDCO to successfully compete against some of the largest global manufacturers of pumping equipment. Now, our efficiencies rival those of our much larger competitors and, with FEDCO's greater agility and lower overhead costs, the company is thriving in a tough global manufacturing environment.”

Eli Oklejas, President
Fluid Equipment Development
Company, LLC (FEDCO)



Streamlines shown in cross section through pump impeller, diffuser, and housing of HPB

CASE STUDY