

STAR-CCM+

DISCOVER BETTER PUMP DESIGNS. FASTER.

EXPLORE DIGITALLY, CONFIRM PHYSICALLY

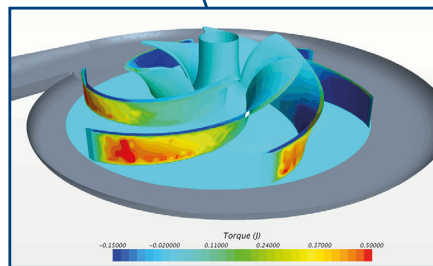
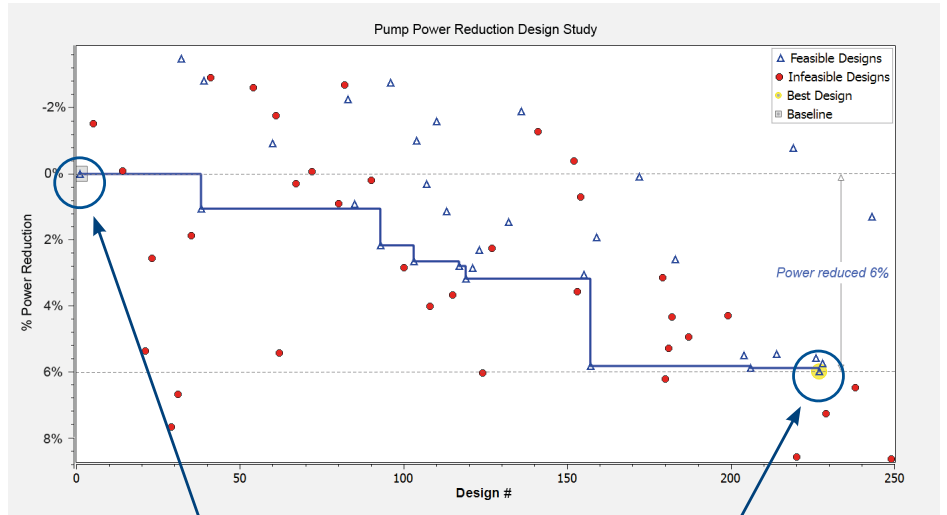
Use simulation to optimize your pumps for efficiency, reliability, and durability before committing to costly physical prototyping and testing.

Minimize the required power by comparing numerous pump design iterations.

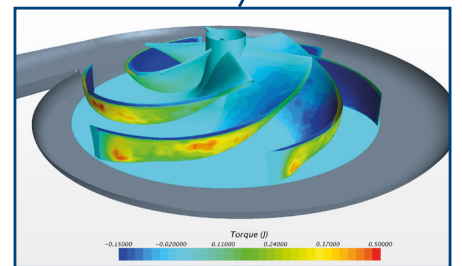
Automatically explore your complete design space, to discover new designs that are both desirable and feasible.

"STAR-CCM+ has all of the features required to solve extremely complex problems in hydraulic turbomachinery."

Edward Bennett
Ph.D., VP of Fluids Engineering,
Mechanical Solutions Inc. (MSI)



Baseline design



Best design (improved by 6%)

EVALUATE PERFORMANCE UNDER WIDE-RANGING OPERATING CONDITIONS

It's not only about predicting performance at the Best Efficiency Point (BEP).

Anticipate what will happen when your pumps are operated at off-design points to avoid costly shutdowns and manage warranty risk.

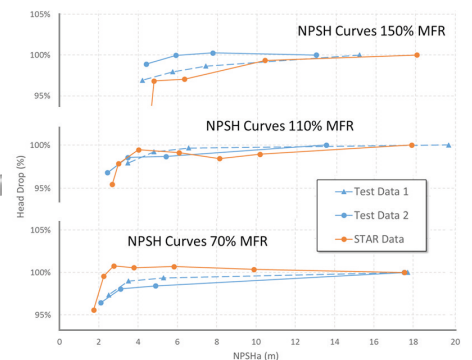
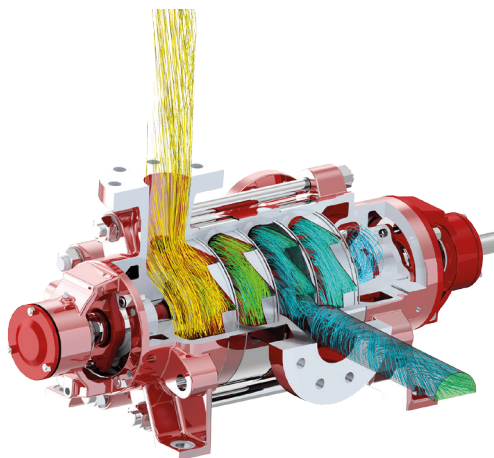
"Pumps that are not efficient enough will either be removed from the market or will require redesign. Some estimates put this at up to 20% of the pumps on the market today."

Empowering Pumps

September 2015

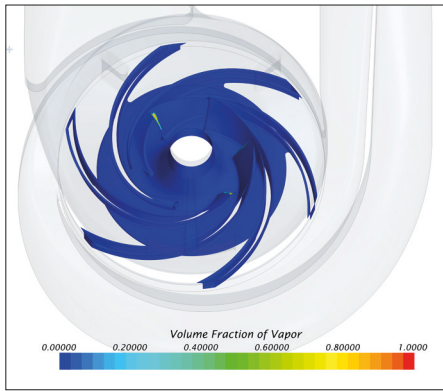
"Operating conditions that were not mentioned in the pump's order document and were not considered in pump design have been responsible for more than 60% of all unscheduled shutdowns."

Turbomachinery International
July/August 2015

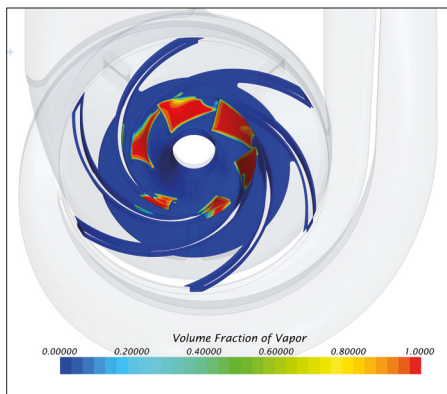


DEPEND ON SOPHISTICATED PHYSICS TO ACCURATELY PREDICT CAVITATION AND VIBRATION

Confidently know when and where cavitation will occur (visualized as the volume fraction of vapor) by efficiently computing transient solutions under different pressure conditions.

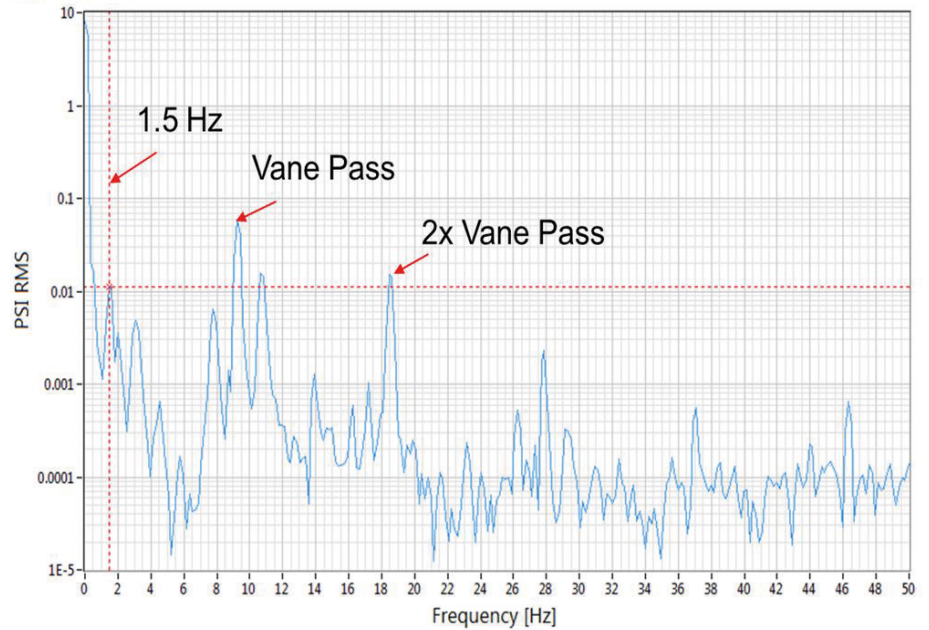


Inlet total pressure = 175 kPa



Inlet total pressure = 27 kPa

Impeller Inlet



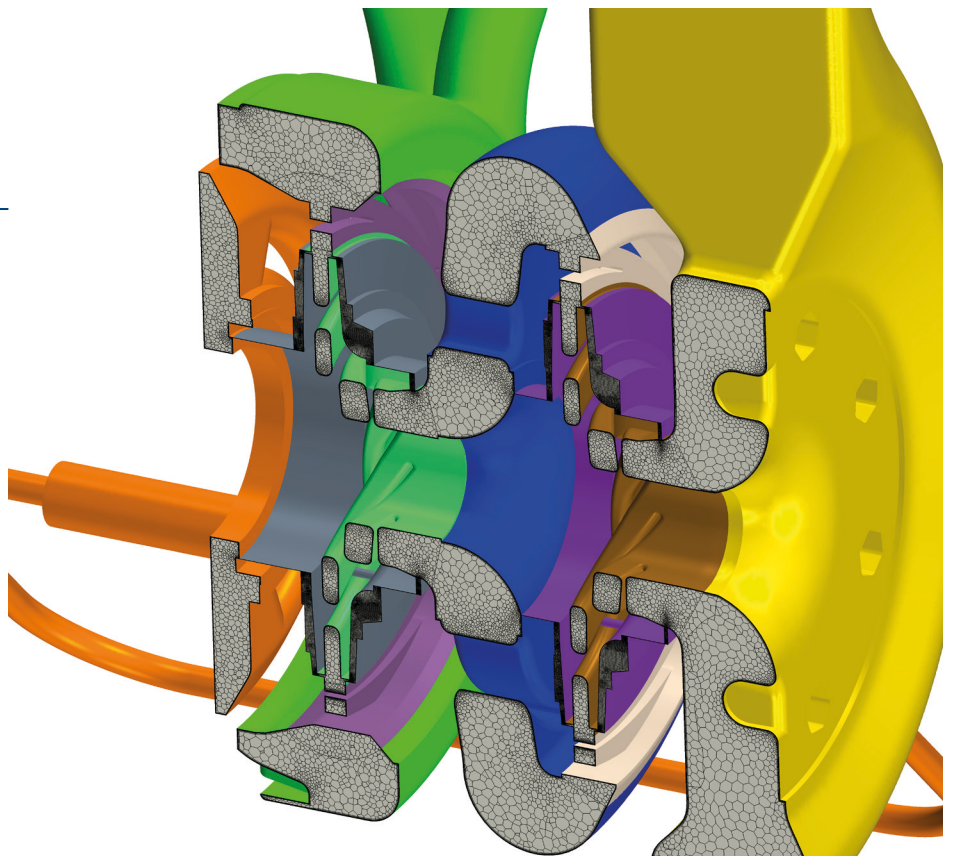
Transform pressure time-histories to frequencies to help avoid excessive levels of flow-induced vibration.

ACCELERATE PRODUCTIVITY BY SIMULATING REAL, COMPLEX GEOMETRIES

The #1 challenge preventing companies from doing more full-fidelity CFD simulation is often the amount of time and effort required to mesh complete pump models.

Robust polyhedral cell meshing and boundary layers in STAR-CCM+® remove that bottleneck by:

- Directly using 3D CAD models for CFD simulation (thus avoiding approximations and simplifying assumptions)
- Ensuring computational accuracy, especially for swirling flows
- Enabling truly automated design space exploration



Include small gaps and clearances in simulations to accurately predict important flow dynamics.

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