



# SES PROCESS TECHNOLOGY GROUP

A Division of Stress Engineering Services, Inc.

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## Process Equipment Designers & Operators...

### SES Offers Accurate, Cost-Effective Testing & Analysis



CFD Model of a Regenerative Turbine Pump

Prototyping is expensive. Putting a flawed design into service in a competitive market is even more expensive. SES specializes in analysis and testing of process equipment. Using state-of-the-art methods such as computational fluid dynamics (CFD) simulation, we help our clients bring new designs to market quickly, reduce prototype testing, and lower development costs. Once the equipment is installed, our equipment design and process engineers work together to solve process system problems and improve current designs.

Rotating equipment is just one of the areas in which SES offers analysis and testing services. These figures show the analysis of a regenerative turbine pump using CFD and the experimental setup used to validate the model results. The pump's construction includes an injection-molded polypropylene body and an elastomeric impeller to handle two-phase liquid/solid flow.



Testing to Validate CFD Model

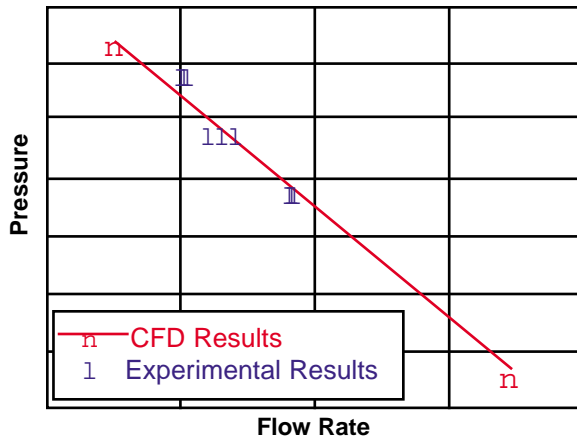


Fig. 1 CFD - Experimental Results Comparison

Figure #1 compares the pump curve generated by the CFD model of the regenerative turbine pump with experimental results. The level of accuracy demonstrated is typical and allows SES to use CFD analysis as a powerful tool for improving current designs and optimizing new products.

Figure #2 shows pathlines of solid particles flowing through the pump. SES uses visualization methods such as these to help our clients understand the effect of design decisions on material flow, wear patterns, and process efficiency.

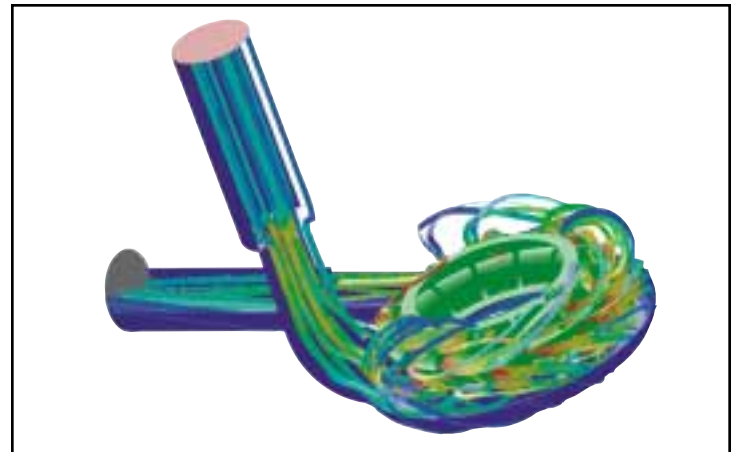


Fig. 2 Pathlines of Solids Flowing Through Pump

SES performs process flow and heat transfer analysis supported by testing on a wide range of process equipment, including:

- Pumps, Fans, and Blowers.
- Heat Exchangers.
- Cyclones and FCCUs.
- Papermaking & Converting Equipment.
- Flow, Vibration, and Waterhammer Analysis of Piping Systems
- Mixing Equipment.
- Reactor Vessels.
- Atomizers and Spray Dryers.
- Polymer Processing Equipment - Extruders, Injection & Blow Molding Machines.

**For more information on how the  
SES Process Technology Group can help you  
improve your equipment and process design,  
give us a call today**

**For more information about SES,  
visit our web site at [www.stress.com](http://www.stress.com)**

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