

CASE STUDY

A New Hydraulic Profile for Reduced Cavitation Erosion

Sulzer has delivered boiler feed water pumps to many power stations all over the world. In certain circumstances at high load variation, erosion has been observed on the diffuser of these pumps.



Test on a scale down model of a boiler feed water pump with diffuser

The Sulzer difference

Thanks to its unique expertise in hydraulic and frequential analyses and its know-how in terms of numerical simulation, Sulzer can develop new solutions for any customer.

The challenge

Changing the pump's diffuser on a regular basis has the two following main consequences for the customer:

- frequent spare part consumption
- high frequency of maintenance

The challenge for Sulzer was to model the hydraulic phenomenon and cavitation patterns to identify and locate the wear erosion, confirm the results by test and develop a new profile for the diffuser.

The customer expectation was to get a new diffuser with less or even no cavitation.

The solution

Sulzer developed a new design including geometrical changes and a new number of edges. A Finite Elements Analysis including flow and structure analyses was performed on the selected diffuser to confirm the design. Last but not least, tests such as measurement of the fluid-borne noise and quantification of the cavitation erosion reduction were performed to validate the proposed solution.

Customer benefits

The customer chose Sulzer for many reasons:

- Numerical simulation know-how
- Fitted test bed
- Hydraulic expertise
- Cavitation energy measurement

Thanks to this solution, our customer was able to optimize the maintenance period on the pumps while increasing process reliability and productivity.

Continuing its collaboration with the customer, Sulzer is now manufacturing these diffusers by 5-axis machining from a forging which divides delivery time by 2.

Contact

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Applicable markets

Retrofit services

Applicable products

Barrel pump with diffuser