

CASE STUDY / 改造案例

## A New Hydraulic Profile for Reduced Cavitation Erosion 为减少汽蚀而设计的新水力模型

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.

苏尔寿已向世界各地的电站提供了众多锅炉给水泵。在一些高负载变化的情况下，这些泵的导叶上发现有汽蚀破坏。



Test on a scale down model of a boiler feed water pump with diffuser  
测试一个带有新导叶的、缩小尺寸比例的锅炉给水泵

### 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.

### 挑战

定期更换泵导叶，对用户有下面两方面主要影响：

- 高的备件消耗
- 高的维修频率

苏尔寿的挑战是，模拟水力分布及汽蚀发生条件，以辨识和定位磨损腐蚀位置，通过试验来进行验证，从而开发新的导叶水力模型。

客户希望苏尔寿能够提供低汽蚀甚至没有汽蚀破坏的新导叶。

### 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.

### 解决方案

苏尔寿开发了新的导叶水力设计模型，包括了形状改变和边界条件。新的导叶设计通过流量和结构的有限元分析来校核，最后，再通过试验。如，通过负载条件下的噪音测量和汽蚀的减少程度，来验证解决方案是否可行。

### 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.

### 苏尔寿的特点

苏尔寿凭借其独特的、在水力和频谱分析以及数值模拟方面的专业技术知识，可以为任何一个客户提供全新的解决方案。

## Customer benefit

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.

## 客户利益

客户选择苏尔寿的理由：

- 数值模拟专业分析
- 合适的试验台
- 专业的水力知识
- 汽蚀的测量

非常感谢这个方案，我们的客户能够使泵的保养周期更优化，同时增加生产过程的可靠性和生产能力。

苏尔寿与客户持续这个合作。现在，我们利用五轴加工中心将锻件加工成这些导叶，交货期为2周。

### Contact / 联系

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### Applicable markets / 应用市场

Retrofit services

改造服务

### Applicable products / 适用产品

Barrel pump with diffuser

带有导叶的筒袋泵

[www.sulzer.com](http://www.sulzer.com)

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