

## CASE STUDY

# Repair Time Cut by 66% Means Less Downtime for Steel Plant

A Brazilian steel manufacturer was quoted 18 months by an OEM to replace two impellers on an integrally geared 4-stage compressor. The customer turned to Sulzer to provide an alternate solution, as 18 months without this operational capacity was unsustainable. The project required an approach which would minimize downtime via meticulous planning and an efficient working methodology. With an output of over 7 million tons of steel a year, reducing the financial impact of the repair work was also a key proviso.



The steel industry is under increasing pressure to minimize running costs

**“** *The key was the close coordination of the various teams of design engineers, site engineers and manufacturing personnel as well as the ability to clearly communicate progress with the customer. In this way, decisions on the repair process were made with all the necessary information in place, making the project much more efficient.* **”**

Rafael Ribeiro, Project Manager for Sulzer

### The Sulzer difference

- The compressor now operates effectively with increased reliability
- 66% reduction in project timescale
- Total repair cost reduced by 35%
- Service Center offers unique expertise to design, manufacture and deliver an exact solution quickly

### The challenge

Planning had to be extensive to ensure minimal stoppages, with planned downtime scheduled to reduce the impact of the works on profitability. Sulzer quickly dispatched an experienced field service team to carry out the detailed diagnostics and start the process. The investigation unearthed a number of problems:

- Reduction in wall thickness of third stage impeller
- Cracks in fourth stage impeller
- Compressor was found to display no operational reliability

The customer therefore required two replacement impellers on a short lead time to ensure the continued operation of the compressor.

### The solution

- Sulzer utilized portable coordinate measuring machines (CMM) and laser scanning to create a 3D drawing of the impellers.
- During this process, Sulzer noticed that the corrosion resistance of the impellers could be improved, so recommended that the replacements be manufactured from chrome molybdenum vanadium steel.
- Sulzer's Houston Service Center in Texas designed and manufactured the new impellers, with each vane section manufactured by a 5-axis vertical milling machine from a solid piece of the specified alloy.
- The vanes were then welded to the outer casing, with the complete impellers quickly delivered to the field service engineers for commissioning, installation and customer handover.



The new impeller vanes were manufactured from a solid piece of chrome molybdenum vanadium steel using 5-axis vertical milling machine



Corrosion resistance of the components was improved by upgrading the base material



The new components allowed the project to be delivered with a huge time saving over the OEM proposal

#### Contact

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#### Applicable markets

Metal, Steel Industry

#### Applicable products

Impellers and vanes, 4-stage  
Compressor

## Customer benefit

The primary benefit to the customer was a 66% reduction in project time, with Sulzer delivering the solution within a 6-month timeframe. This provided 12 months of operational time that would not have been available via the OEM repair option. To compound this benefit, Sulzer was also able to deliver a 35% cost saving across the entire project. In addition, the increased corrosion resistance of the new impellers offered an extended service life over prolonged use. The overall effect for the steel manufacturer was an improved return on investment (ROI), minimal downtime and increased profitability.

## Product data

- 66% reduction in project time schedule compared to OEM, with the duration slashed from 18 to 6 months
- 35% reduction in total cost across the repair work
- Impellers manufactured from chrome molybdenum vanadium steel to deliver an extended service life due to increased corrosion protection
- Design, manufacture, installation and precision laser alignment carried out by Sulzer as part of project
- Work carried out during planned downtime to minimize financial impact for customer, enabled by a detailed repair plan and assessment
- Communication and coordination with customer teams ensured increased efficiency due to the transmission of necessary information



The new impellers were designed and manufactured at Sulzer's Houston Service Center in Texas