CASE STUDY

Reverse Engineering by Improving Efficiency and Increasing Reliability

Built after the Second World War, a steel company had several pieces of equipment manufactured in Japan from the 50's onwards. Some equipment were obsolete in the pump market, and the replacement of parts was becoming a big problem for maintenance. The 1,000kW pumps required high operational reliability and suffered from poor energy efficiency due to the processes designed at the time. Three similar pumps were operating in the refrigeration system of the hot rolling process of the steel mill.

> *"Reverse-engineering, the art of making the past rejuvenate without losing the original conception experiences."*
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> L. Devanil - Retrofit Engineer

The challenge

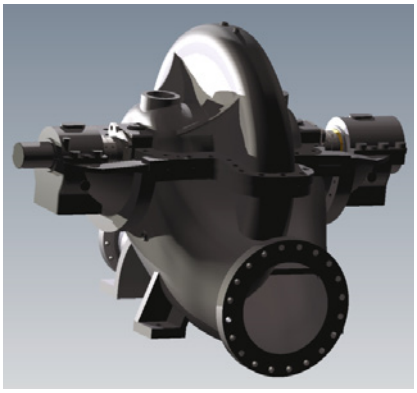
The original pumps have low operating reliability and constant interventions for maintenance (every 3 months) were required due to the impossibility of replacing some components (housing, bearings, impeller, etc.) which are complex to manufacture. The employed maintenance methods caused high costs to the operation of the plant and a long time of unavailability of equipment. The original pumps are large and their replacement by other pump models could result in considerable changes in installation and would demand a very long shutdown period of the plant, bringing large financial deficits. Our best solution is reverse engineering.

The solution

Sulzer completely re-engineered, manufactured and installed a new pump, adding to the original concept of the project current technology and new production processes. With a touch of engineering we reduced the environmental impact and energy consumption of the customer by 11%. The equipment has been fully developed, manufactured, assembled and tested by Sulzer. The new installation has passed the first test of performance, achieving an efficiency increase of 11 percentage units from 70 to 81%, proving the competence and reliability of the engineering calculations.

The Sulzer difference

The retrofit team of Sulzer is qualified for all the applications of reverse engineering, relying on software developed for this application, bringing the reliability required with low cost and always seeking the best benefits for the customer.



Customer benefit

With the current manufacturing processes employed by Sulzer and with a highly trained engineering corps, Sulzer's reverse engineering process becomes a fast and safe solution with benefits that impact directly on the maintenance cost of our customers. In this case of re-engineering, the main objective is to enable, ease and reduce the maintenance process of this equipment, making it possible to replace parts that are worn out and bring new life to old equipment. Since commissioning in May 2014, the pump is running without any failures. Besides enabling the manufacture of parts, this project also involved an additional challenge; increasing energy efficiency by 11%.

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Applicable markets
Customer support services, water, power generation

Applicable products
Retrofit, reverse engineering