

CASE STUDY

Industry: Metal Industry
Customer: Aluminium Mill in France

OFF-HIGHWAY
POWERTRAIN SERVICES

▶ Off-Highway Powertrain Services helps to reduce unplanned shutdowns in an Aluminium Mill

▶ Case Description

Our customer in the metal industry was incurring fractures on cardan shafts on a regular basis because of unexpected process-induced peak torques. Due to limited space on the roller side, it was not possible to use a larger cardan shaft to compensate for the peak torques. A standard catalogue part solution would not solve the customer problem.

The customer requested Off-Highway Powertrain Services (OHP Services) assistance to understand the process better and reduce machine downtime. OHP Services installed a torque measurement system during a planned production stop to continuously monitor and diagnose the cardan shaft condition. We also performed diagnosis taking into account actual production loads and subsequently designed and delivered a tailor-made cardan shaft to withstand the high loads.

This guaranteed a doubled service-life of the cardan shaft, but also reduced unplanned breakdowns. In addition, the signals from the new torque monitoring system were connected directly to the customer's machine control (IBA). Based on the results of the torque monitoring system, the customer was able to optimize his production parameters, improve the rolling process and increase productivity by approximately 10%.

OHP Services is actively working with the customer to re-design the powertrain based on the torque monitoring system findings to achieve even higher productivity and further reductions in maintenance costs.

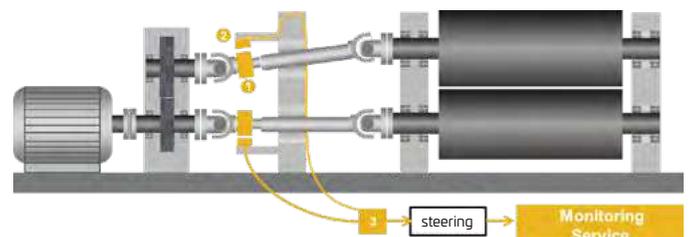
▶ Technology Snapshot

Torque Measurement and Monitoring

A telemetry unit is used for torque measurement on a rotating transmission shaft. The torque telemetry has a rotating element on the shaft that measures the torque-induced strain from an electric strain measurement device (see Figure below).

The torque signals can be provided to the machine control (e.g. IBA System) or directly to a data acquisition system depending on the existing infrastructure and the project requirement. The torque signals are analysed and interpreted by OHP Services experts on a regular basis.

The machine operator receives a regular report containing the recorded torque signals, the torque events, the torque statistics (mean-, max torque, torque amplification factor, load spectrum) and damage indicators.



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▶ **Challenge:**

- ▶ Reduce extensive wear and costs by eliminating **joint replacement every 10 months**
- ▶ Understand and optimise production parameters

▶ **Solution:**

- ▶ Identify high torque peaks which occur during the processing of aluminium using continuous torque measurement and analysis
- ▶ Tailor made cardan shaft to solve the customer problem
- ▶ Optimise process parameters

▶ **Customer Value:**

- ▶ Reduced risk of unplanned shutdowns and subsequent damage to the powertrain
- ▶ Clear view on the combination of process parameters that are creating the peak torques and the solutions implemented to reduce them
- ▶ Increased reliability of cardan shaft with a **service-life improvement by factor of 2**
- ▶ Potential of increased productivity **(+10%)** and reduced overload risk by implementing OHP Services solution

▶ **What's special?**

- ▶ OHP Services is a valuable partner – we not only take measurements but also solve customer problems by identifying the root cause and rectifying it. Additionally, OHP Services delivered a customised product and are currently working on improving the production process through our Engineering Services.



Installation of the telemetry unit

OFF-HIGHWAY
POWERTRAIN SERVICES

WORLDWIDE

Off-Highway Powertrain Services collaborates with manufacturers and logistics partners worldwide: benefit from our extensive network. By means of our Service Parts Availability Module, you can define which part are to be available, and how quickly they can be delivered to your location – regardless of manufacturers. We also offer customized spare parts to our clients on stock.

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This case study is exemplary only. Any and all information, data, values, products, procedures etc. which are mentioned in this case study vary from case to case and can be different. For calculation pertaining to your business, please refer to a Off-Highway Powertrain Services employee.