

Increasing plant availability in steelworks

Modernisation measures deliver critical plant section
transparency and reduce downtimes



Our customer:

One of the leading manufacturers of steel products in the United States.

- **Already 100 years on the market**
- **Approx. 26,000 employees**
- **More than \$22 billion turnover p.a.**

However, the company faces many challenges: Unexpected stoppages in production lead to high consequential costs caused by unplanned production downtime with ongoing fixed costs. In order to avoid such production downtimes, failure-critical plant sections were equipped with sensors. The aim of using sensors is to reduce the annual costs for unplanned plant downtimes to a minimum.

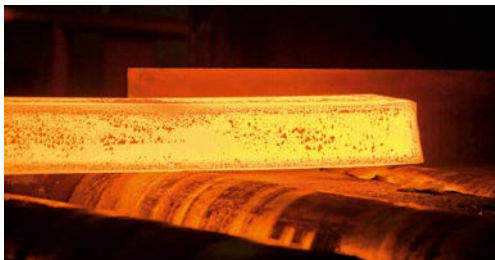
CASE STUDY | STEEL & METAL INDUSTRY



The challenge:

In the past, the company regularly suffered from long downtimes of up to 14 hours which affected their rolling stands during steel processing. The reason: Process values that could have indicated a failure was imminent were not monitored. If action is not taken at an early stage, overheating occurs in the rolling stands, leading to long downtime and its related costs.

At the same time, the amount of rejects increases due to the failure, which results in higher disposal costs. Before the modernisation, there were on average four major plant downtimes per year. The costs incurred were immense: 56 hours of unplanned plant downtime equates to a loss of \$232,000 due to rejects and costs of \$276,000 due to the necessary repairs.



Therefore, the goal is to monitor critical plant sections using additional sensors to prevent unplanned downtimes by means of condition monitoring.

The solution – why ifm?

The reasons for overheating in the rolling stands are numerous: The flow rate, the temperature and the pressure of the cooling water as well as the temperature of the rolling stand bearings can be contributing factors.

The modern magnetic-inductive volumetric flow sensors of ifm's SM series are used to detect leakages and insufficient cooling water flow rates in the rolling stands' cooling lines.



They do not only monitor the flow rate, but also the inlet and outlet temperature of the cooling water. Pressure sensors of ifm's PN series were installed in the steelworks to make sure the system pressure in the cooling lines is set correctly and deviations do not go unnoticed. This ensures the optimum operating condition of the cooling circuit at all times. TP and TS series temperature sensors monitor the bearing temperatures at the rolling stands, so that any danger of overheating is recognised early.

The steelworks' central control system monitors, processes and visualises all sensor signals. Whenever one of the measured values is outside the permissible range, a message to stop the rolling process goes out immediately before any damage can occur. Troubleshooting becomes much more efficient because the possible causes can be narrowed down by monitoring the critical measured values. All in all, the costs for production downtime, repairs and rejects can be significantly reduced. The timely and time-limited shutdown increases the overall plant availability.

Results:

- Fewer unplanned downtimes due to the use of sensors
- Employees benefit from extensive information
- Predictive condition-based maintenance
- Prevention of production losses and repair costs
- Significant increase in plant availability through avoidance of downtime



\$2.5 million
saved in 5 years

280 h
saved working hours
in 5 years

100 %
reduction in rejects and
downtimes



[ifm.com](https://www.ifm.com)