

## Life cycle services



# Our life cycle offerings

With many years of experience in this field, ANDRITZ METALS is your experienced life cycle business partner. The content comprises activities from the spare and wear part service sector, revamping, as well as maintenance and operating services, all provided by our experts in OEM quality.

Spare/wear part services	Revamp services	Maintenance and operation services
Classic spare and wear parts	Equipment and system updates	Field services, optimization, training
Maintenance management system	Rebuilds, revamps, and retrofits	Studies on process performance and improvements
Part/product improvement with engineered spare and wear parts	Supervision services and quality control	Predictive maintenance
Computer-aided spare part management	Automation and process upgrades, improvements	



▲ Knife heads of edge scrap shear behind side trimmer



▲ Cardan shaft change at leveling machine

## Extract from our reference list

- Acerinox Bahru Stainless, Malaysia
- ArcelorMittal, Belgium
- Baosteel Special Steel Co. Ltd., P.R. China
- Hugo Vogelsang, Germany
- Jiuquan Iron & Steel, P. R. China
- North American Stainless, Kentucky, USA
- NLMK, Russia
- Outokumpu, Finland
- Outokumpu, Germany
- Rautaruukki, Finland
- Stahlwerke Ergste ZAPP, Germany
- Taiyuan Iron & Steel, P.R. China
- voestalpine, Austria
- Wuhan Iron & Steel, P. R. China
- Yieh United, Taiwan

# Services for reliable operation throughout the entire plant life cycle

## Spare/wear part services

ANDRITZ METALS is your reliable OEM supplier for all types of manufactured spare and wear parts. In addition, we are able to offer favorable prices for numerous purchased parts thanks to ANDRITZ's purchasing power. With this service, you can increase your production time at much lower running costs.

## Revamp services

One example of a successful revamp can be found at Hugo Vogelsang's 20-high rolling mill in Hagen, Germany. After modernization work, the mill achieved strip thickness deviations of 1-2 microns and strip shape deviations of 4-6 I-units. This result was possible with the following modernization efforts:

### Mechanical

- Hydraulic screw down
- Axial shifting
- Guide and spray plates
- Steering roll units with shielded shapemeter
- Upgrade for shape measurement and control system

### Electrical and automation

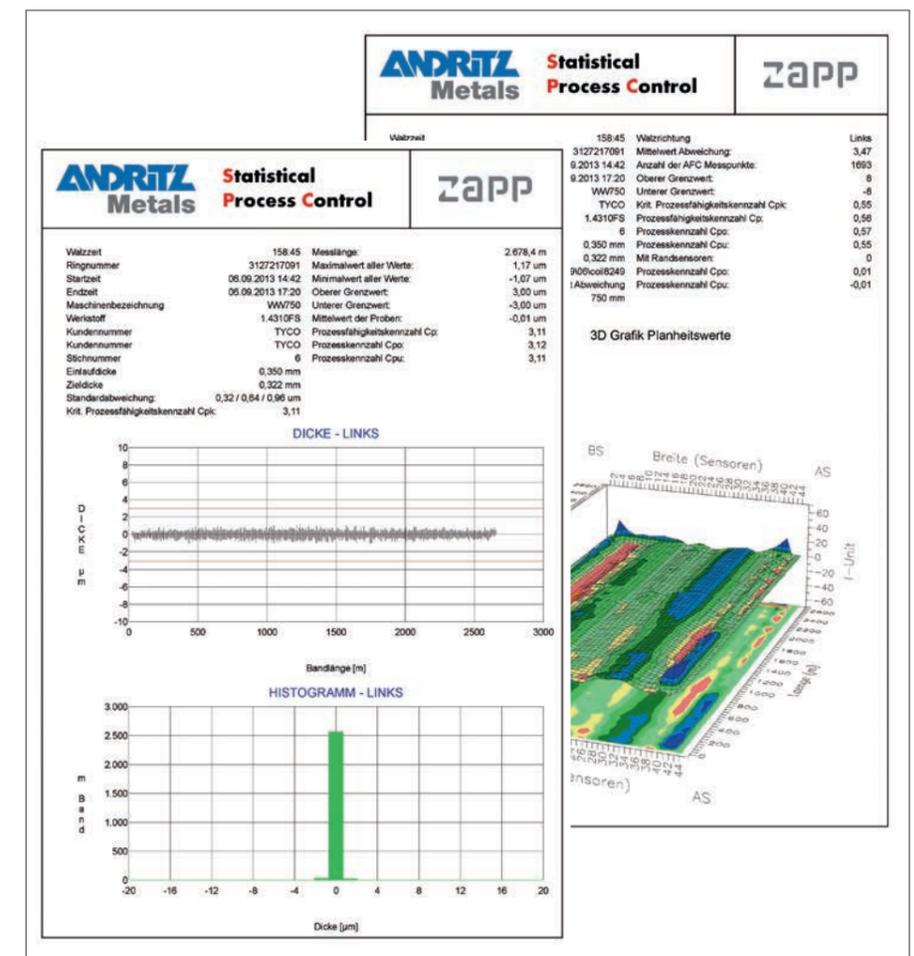
- Automation systems
- Technological control systems for strip thickness, roll force, strip tension, strip guiding, and flatness
- Drive technology
- Main control desk with process visualization
- Technological process computer

The quality report shown indicates the strip thickness and strip shape result achieved during the acceptance test for a wedge-type strip.

## Maintenance services

ANDRITZ workshops are able to provide a series of services, especially for cardan shafts with overload clutches. These shafts

need to be serviced at certain intervals. The important issue besides replacing wear parts is to set a reliable overload level. To render this service, ANDRITZ METALS operates a test stand.



▲ Statistical process control

# Process and condition monitoring

You have invested millions in your production equipment, and when it fails, your equipment is out of commission. No matter how long, this impacts your business and of course, also your profit. This is why you need the most accurate tools available on the market to monitor your equipment.

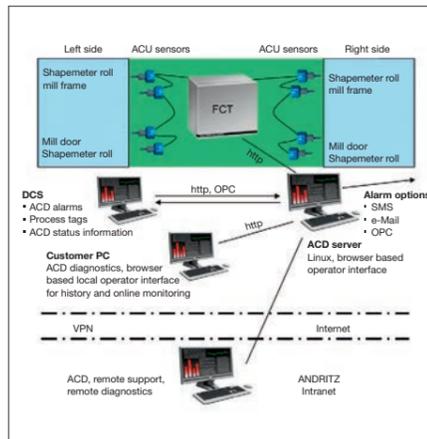
## The Advanced Condition Diagnostic (ACD) system

ACD tools monitor machines that have been difficult or impossible to observe and analyze, using new technology designed to detect and predict problems before they occur.

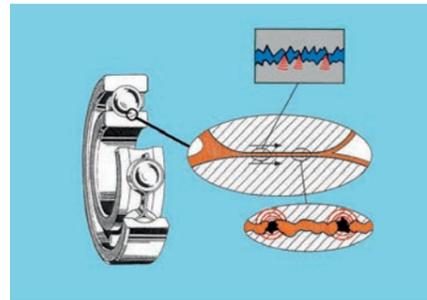
How does it work?

ACD tools use Acoustic Emission (AE) technology. Rapid changes in the microstructures of material generate elastic waves. Piezo sensors detect and continuously record the amount of energy generated. AE technology is very adept at detecting overload, lubrication problems, crack propagation, and incipient machine fault. ACU sensor indicators on the HMI are marked with colors corresponding to the level of AE. For example, green indicates normal operating conditions, yellow an alert requiring attention and correction, and red a critical operating condition requiring immediate action.

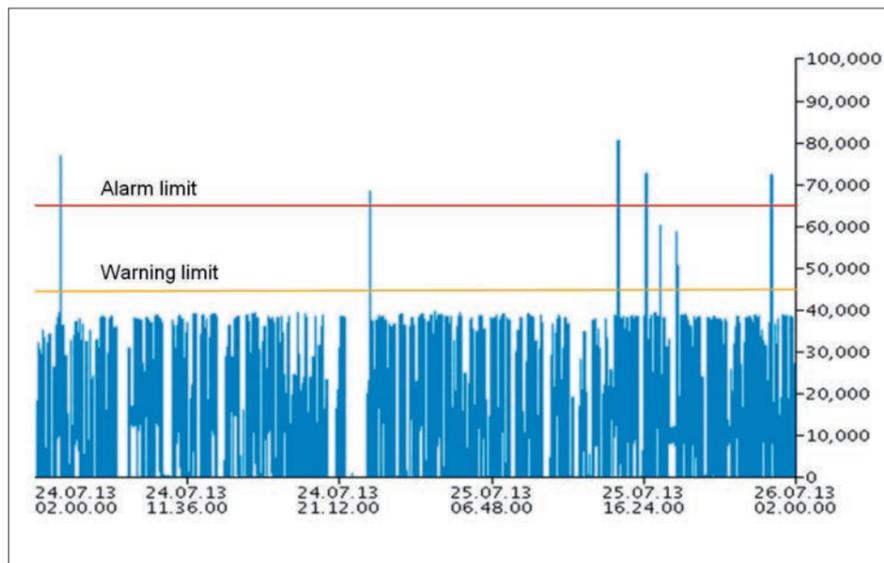
This monitoring produces data that are sent to an ACD server, which offers a web-based Human-Machine Interface (HMI). Browser-based HMI data is available for all users in the plant's network. ANDRITZ METALS experts will help you to interpret these data. Remote user and diagnostics support are also available.



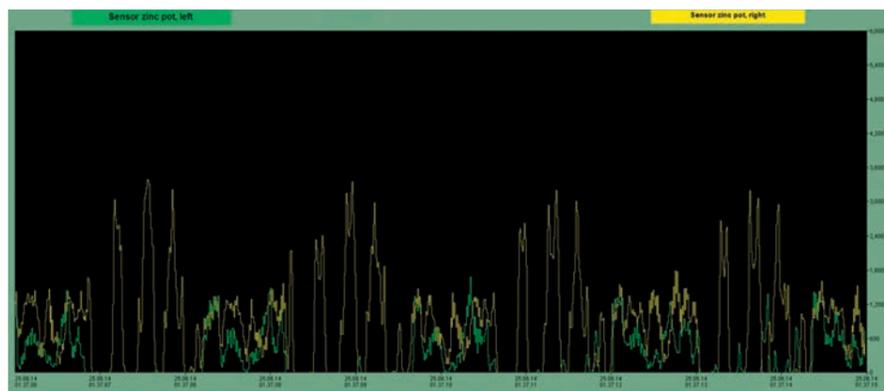
▲ ACU system operating diagram for 20-high rolling mill monitoring



▲ Poor lubrication or contaminants in lubricant cause increased emission levels



▲ X-time (2 days), Y-AE counts



▲ CGL process monitoring showing instable process situation

# Fault detection at an early stage

With such condition monitoring by an ACD system, customers can eliminate sudden equipment failures almost entirely. As a result, maintenance is predictive, production time and yield are increased, unexpected maintenance time is very much reduced, and expenses for spare parts can be controlled more effectively.

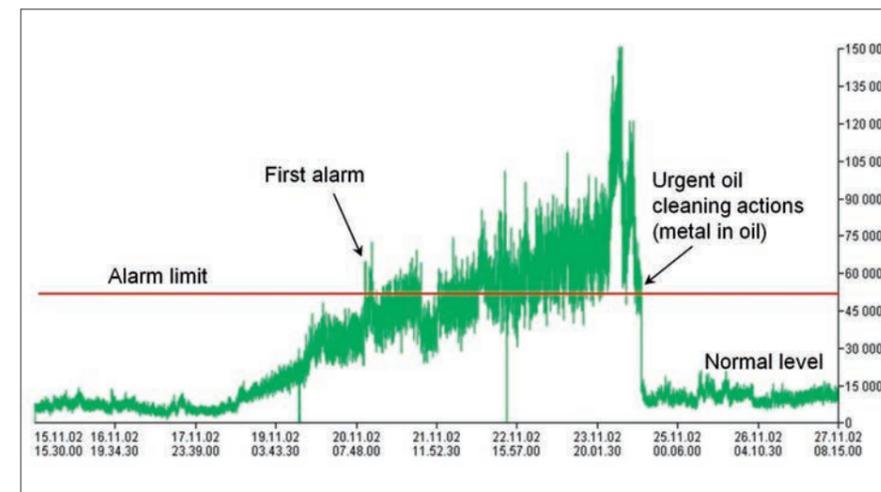
## ACD system features

- Measuring principle based on Acoustic Emission (AE)
- Online diagnostics
- Fault detection at an early stage
- Continuous status information
- Oil contamination detection in gear boxes and bearings
- Friction and lubrication condition monitoring
- Hydraulic drive and gear box condition monitoring
- Early-stage detection of serious crack development

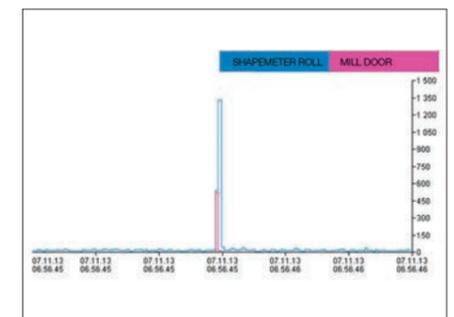
## Possible applications for the ACD system

1. Monitoring the rolling process  
This will provide opportunities
  - to find and repair edge cracks
  - to minimize strip breaks and any subsequent damage
  - to decide with the help of this tool on whether edge trimming is required
2. Monitoring the galvanizing process  
Here it is possible to detect
  - incipient cracks and their progression, wear on ceramic bearings and bearing seat inside the zinc pot
  - strip slipping on pot rolls
  - unstable load situations and process resonance near zinc pot lubrication problems or imminent bearing failure

3. Monitoring the thrust bolt bearings – predictive condition diagnostics  
The most demanding bearings to be monitored are located on the vertical axis inside the rolling mill, and their only lubricant is rolling mill oil mist. Oil lubrication is not designed primarily for the bearings, but for the needs of the rolling process. Hence, the oil has a low viscosity. Additionally, no sensor can be taken directly to these bearings. Thus, the signal has to be registered from a longer range through the transmission of the rolling mill structure. The ACD system sends SMS and e-mail warnings as well as alarms, depending on the individual limits set for each sensor.



▲ Typical count trend indicating increasing friction and unstable function on a bearing over 4 days



▲ Edge crack monitored on a 20-high rolling mill with sensor on shape meter roll and mill door

# ACD monitoring for a wide range of applications

With references in different applications, ANDRITZ METALS is ready to support and adopt this technology at customers' specific requests for any additional application.

## Only a few of many applications for ACD:

Equipment	Monitoring section	Monitoring for	Since
Sintering plant (FeCr pellets)	Hydraulic motors and drum bearings	Spare part stock holding	2012
6-high tandem cold rolling mill	Thrust bolt bearings	Fire prevention and maintenance	2004
	Fleece rolls	Product quality and maintenance	
	Welding machine	Maintenance	
20-high rolling mill	Thrust bolt bearings	Fire prevention and maintenance	2003
	Shape meter roll	Product quality and maintenance	
Continuous caster	Segment bearings	Product quality and maintenance	2001
Blast furnace	Charging unit	Steady production and maintenance	1999
Plate mill	Work roll bearings	Maintenance	1998
	AGC (Automatic Gauge Control)		
	Gear boxes		

### Extract from our reference list

- Antwerp Decoil Center, Belgium
- Laura Metals, Netherlands
- Salzgitter Flachstahl, Germany
- Salzgitter Mannesmann, Germany

# ECOMode Upgrade your regeneration

Save energy and reduce emissions - with ECOMode you are one step ahead.

The newly developed process for HCl acid regeneration plants represents the next big step in a series of improvements, and is not only used for new installations, but also in existing plants. Attractive service packages are available to upgrade systems that are already running, with low initial investment and including long-term support via remote diagnosis, effective personnel training, and regular site visits by our experts. Our patented ECOMode demonstrates its enormous potential. Fuel consumption and emissions are reduced by 25%. Alternatively, you can ramp up your production by the same amount. On existing installations, the upgrade comprises measures for both the equipment and the control software.



▲ Dust separator and injection of waste pickle at the evaporator

### System highlights

- 25% reduction of fuel consumption
- 25% reduction of emissions
- Attractive upgrade service packages
- Remote diagnosis
- Usable for existing and new plants



# Supply program

ANDRITZ METALS is one of the leading global suppliers of complete lines for the production and processing of stainless steel, carbon steel, and non-ferrous metal strip. These lines consist of equipment for cold

rolling, heat treatment, surface finishing, strip coating and finishing, punching and deep drawing, and for the regeneration of pickling acids. In addition, the business area supplies turnkey furnace systems for the steel,

copper, and aluminum industries, as well as laser and resistance welding equipment for the metalworking industry.

## Strip processing lines and acid regeneration plants

for annealing, pickling, shot blasting, coating, galvanizing, painting, surface conditioning, tension leveling, coil preparation, coil build-up, grinding, polishing, etc.

## Cold rolling mills

for reducing, skin passing, cladding and finish rolling in 20-high, S6-high (18-high), 12-high, 6-high, 4-high and 2-high designs as well as combinations of 2-high/4-high or 4-high/S6-high design, available as one-way, reversing or tandem mill, inline and offline

## Finishing lines

for cutting-to-length, slitting, side trimming, tension leveling, rewinding and inspection, blanking, and precision leveling

## Shape control systems and roll grinder

## Industrial furnaces

for melting, refining, and heat treatment, furnace systems for direct reduced iron, heat treatment plants for heavy plates, shaped profiles and piping, direct-to-wire, and tempering systems.

## Automotive solutions

for punching, metal forming and welding

## Electric and automation

Complete electrical equipment including drive systems, process automation and level 2 systems for all production equipment

## Plant modernization

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