Industrial IoT activities at ANDRITZ
Digitalization for industrial applications with Metris
1. ANDRITZ Digital Solutions
   Metris

2. Metris – ANDRITZ GROUP Products and Services
   HYDRO, PULP & PAPER, METALS, SEPARATION

3. SMART Services
   eShop
ANDRITZ Digital Solutions

Industrial IoT
- Smart Sensors
- Big Data
- Augmented Reality

B2B Smart Services
- Customer service portal
- Field service support
- Spare part catalog (eShop)

Ventures
- Cyber Security

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Mission Statement

CUSTOMER NEED IS OUR FOCUS

Value

Smart solutions are the driver

DIGITALIZATION IS THE ENABLER
ANDRITZ Digital Solutions

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Metris
ANDRITZ GROUP Products and Services

Key Product offerings:
DiOMera

Key Product offerings:
OPP

Key Product offerings:
AFC
3D-ViSE
Smart Assist

Key Product offerings:
addIQ

B2B - Smart Services
eShop

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HYDRO
HYDRO – typical project solution
For hydropower plant automation

Power plant automation solutions for
- SCADA system
- Unit control
- Turbine governor control
- Electrical protection
- Generator excitation control
- Switchyard control

Typical use case
- Run of River Power Plant
- 8x Francis Turbines, each 266 MVA
- Total Power Output 2.128 MVA

HPP Hoa Binh - Vietnam

One Automation solution for one customer

The customer receives the complete system for the power plant; the equipment will be installed and commissioned at customers site.
HYDRO – typical project solution
For a SCADA implementation

SCADA solutions for
- Operation of up to 160 HPPs from a central dispatch center
- Remote or local operation
- 6 Operator Stations, 2 Engineering Stations
- Large Screen Display 6x2 70”

Typical use case
- Dispatch Center
- Centralized control of decentralized hydro power plants
- Seamless control of HPPs at >7 rivers

E.ON dispatch center Landshut

Standard SCADA systems for hydropower

One central SCADA system for one customer
The customer receives the complete system for the power plant; the equipment will be installed and commissioned at customers’ site.

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HYDRO - new challenges from today’s energy markets
Volatility and cost pressure

Price volatility
RAPIDLY CHANGING PRICES AND REGULATORY CONDITIONS COMPLEXITY

New financing models
SECURE RELIABLE LONG-TERM OPERATION

Increasing competition
ON ENERGY SOURCES

Asset management
FROM SELF-OPERATED RESOURCES TO PURE ASSET MANAGEMENT

Owners skill change
FROM TECHNICALLY BASED TO FINANCIALLY ORIENTED

Grid volatility and climate change
INCREASING NUMBER OF VOLATILE ENERGY SOURCES AND HYDROLOGICAL CHANGES
HYDRO - success criteria
for today’s power generation

- Reduce total costs, OPEX (total costs = maintenance + unavailability)
- Maximize annual energy production
- Ensure plant availability and safety
- Protect the assets’ value
- Manage complex and instable boundary conditions

ANDRITZ can help and support to reduce maintenance costs and optimize power plant operation
HYDRO – Operation and maintenance
We offer a scalable service concept for maintenance

- Preventive / predictive maintenance
- System assessment
- Daily maintenance
- Remote assistance
- Break down maintenance
- 24/7 assistance
- Enhanced spare part management
- O&M intelligent modules
- Analysis and optimization
- Extended warranty
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- O&M intelligent modules
- Analysis and optimization
- 24/7 assistance
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- O&M intelligent modules
- Analysis and optimization
- Extended warranty

Customizable maintenance services
HYDRO - Operation and maintenance

We offer you a scalable service concept for operation

**BASIC**
- Supervision of units
- Spare part management
- Unit inspections

**ADVANCED**
- O&M intelligent modules
- Safety / environmental management
- Assistance for malfunctions

**PREMIUM**
- Power plant staff management
- Provision of operation staff
- Local / Remote HPP operation

Customizable operation services
HYDRO - Operation and maintenance: locally taking care of your HPP with our global know-how

Customer

O&M Support
(ANDRITZ HYDRO - Locations)

Customer contact and support
Maintenance and its optimization
On-site O&M, local HPP operation
Optimization of production
Condition monitoring

Control Center

Remote HPP operation
24 / 7 assistance
Operational data analytics
Global O&M experts
Metris DiOMera – a new approach
For operation and maintenance of hydropower plants

Operation and Maintenance solution for
- Each power plant, every size, type, location
- Local / remote operation
- Optimization of production
- Customized acc. customer needs

Typical use case
- ANDRITZ HYDRO control center remote operation
- Automation and Monitoring systems installed locally
- Data hosting and big data analyses in the cloud

Standard Operation and Maintenance solution
Operation and Maintenance
ANDRITZ HYDRO is offering a service for Operation and Maintenance. The delivered solution comprises local installation, cloud implementation and remote control from an ANDRITZ HYDRO location.
PULP & PAPER

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PULP & PAPER: OPP (Optimization of Process Performance) – autonomous operation

Optimizing equipment and plants in the pulp & paper and other process industries

Anomalies and deviations detected in an early stage, advising operator or taking autonomous action to correct

Proven technology deployed at various key customers in the pulp and paper industries
METALS
Metris Advanced Furnace Control (AFC)  
Metals - Product portfolio example

**Areas of application:**
- Carbon and stainless steel annealing furnaces
- Includes both heating and cooling sections
- For direct fired (DFF) or radiant tube heating
- For new projects or revamps
- For any furnace vendor (not bound to ANDRITZ)

**Typical results:**
- Short transition time between different materials
- Fully automatic mode incl. speed control
- Tube / furnace overheat protection
- Increased process stability
- Offline simulator for testing new setpoints
- Planning optimizer for better production schedule

Since 2007 ANDRITZ has been developing advanced furnace control strategies for furnaces. AFC is the latest development, resulting from heavy R&D with the technical university of Vienna. Our model has very high precision and can forecast furnace temperatures up to 30 minutes into the future.
3D Simulation with “Digital Twin”

- Independent verification of software functionality (SW FAT)
- Improve software quality during engineering phase and before commissioning
- Higher quality of documentation (e.g. functional descriptions, knowledge database)
- One workflow from concept to Mechanical Design and Electrical & Automation
- Full 3D visualization of the production line and calculation of signal feedbacks

3D Data from CAD Software (Solid Edge)
Definition of kinematic structures in 3D ViSE
Operation of complete virtual production line (SPS, Virtual Control Panel and L1 HMI)
Knowledge transfer between Mechanical Design Department and Electrical & Automation Department

Offline simulation of sequences before software engineering

Internal software test and debugging with virtual panels during engineering phase

Verification and optimization of sequences

Internal trainings

Sales presentation for customers

Operator training before / during commissioning on Digital Twin

Verify locations of further equipment (LOBs, safety fences, safety doors)
Schuler Smart Assist
Digitally assisted “teach in” of presses (1)

Current Situation
- Setup of presses is highly depending on dedicated and more and more rare experts
- Setup is time consuming due to complex steps
- Manual optimization with step-by-step approach
- Setup time is directly influencing production

Target
- Instruction based accelerated setup
- Collision free kinetics calculated automatically
- Fine tuning of forming parameters possible
- Guided “teach in” for key position points

Typical Schuler Press

Typical Schuler Smart Assist improvement curve
Schuler Smart Assist
Digitally assisted “teach in” of presses (2)

**Implementation**
- Structured “teach in” process by using video and text instructions given at press shop
- Setup guidance is including press movement, feeder and transfer as coupled kinematics

**Road Map**
- Implemented for MSP400 press incl. roller feeder
- Available for all presses with latest automation platform delivered
- Retrofit concept in preparation

Setup displays at press shop level

Schuler Smart Assist
Combining 176 years of metals forming know how with digital technology and expertise
SEPARATION
Metris addIQ control systems
Intelligence for machine and process control

Focus

- New Installation
- Upgrades
- Optimization through Automation

Typical use case

- A family of addIQ packages
- For separation business to optimize operation
- From breweries to sludge treatment plants

Scalability

addIQ control systems for solid/liquid separation

ANDRITZ SEPARATION - Modules

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Metris addIQ simulation
Operator Training

Focus
- Authentic operator interface
- Machine digitally modelled
- Realistic operating scenarios and parameters

Typical use case
- Flexible classroom training worldwide
- Multiple participants in one training session
- Training to deal with unlikely machine/process incidents
- Certified operators

Enhanced Training
addIQ simulation for solid/liquid separation

Metris addIQ simulation the ultimate tool to qualify and certify staff
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SMART SERVICE
Either using an identification code at the ANDRITZ equipment or directly guided through the user-friendly application you will find the right parts easily.
Customer benefits

- Streamlining of the part inquiry and order process
- Improved efficiency of a routine work flow
- Up-to-date documentation of what the machine is made of as prerequisite for the solution

Your steps to the solution

- Implement eShop solution
- Equipment should have identification codes

Either using an identification code at the ANDRITZ equipment or directly guided through the user-friendly application you will find the right parts easily.

E-Shop

eShop for spare parts

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