

Industrial IoT activities at ANDRITZ

Digitalization for industrial applications with Metris



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ANDRITZ Digital Solutions

Metris

2

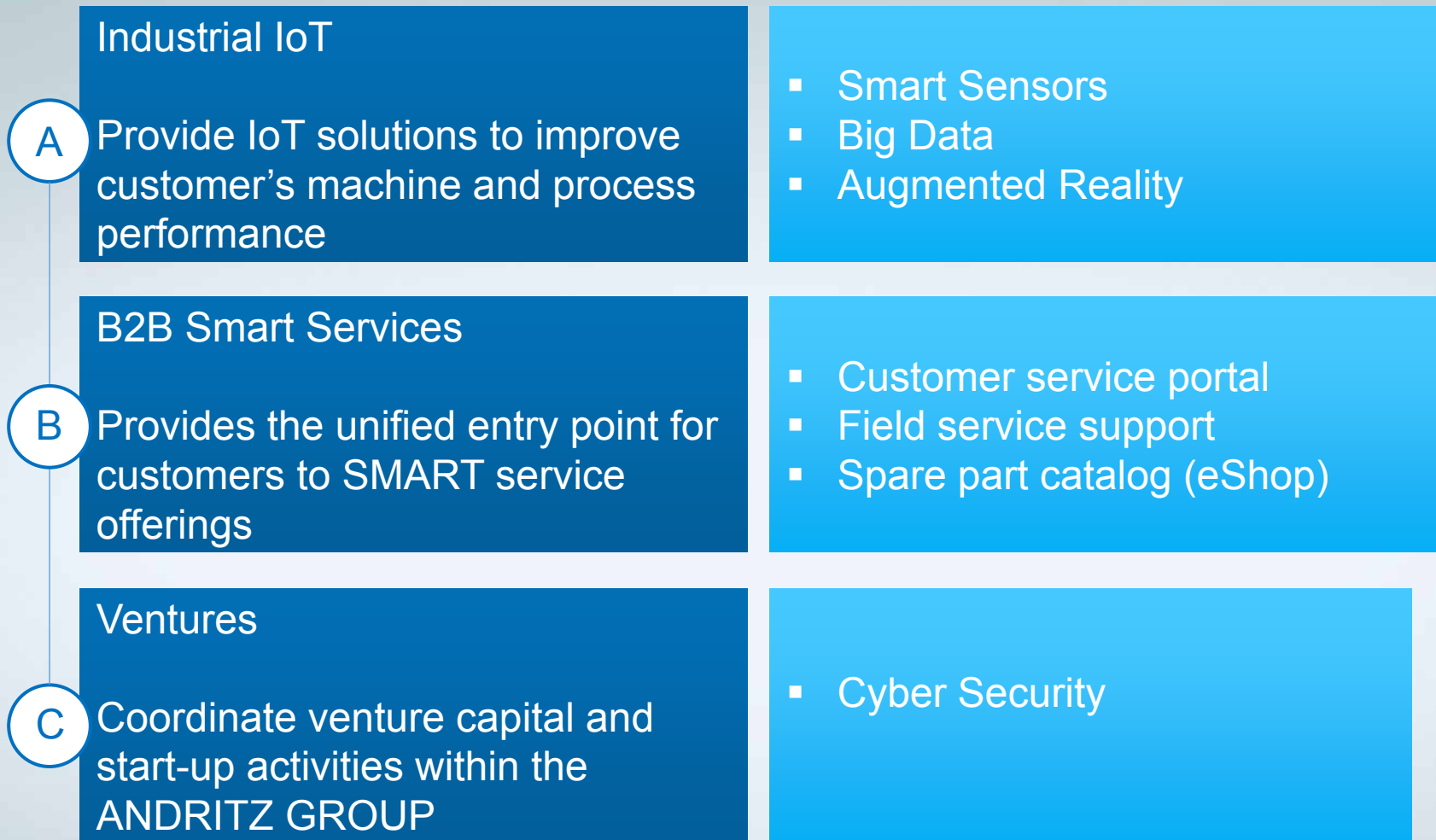
Metris – ANDRITZ GROUP Products and Services

HYDRO, PULP & PAPER, METALS, SEPARATION

3

SMART Services

eShop



METRIS

Mission Statement



Value



CUSTOMER NEED
IS OUR FOCUS



Smart
solutions
are the
driver

DIGITALIZATION
IS THE ENABLER

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ANDRITZ Digital Solutions Metris

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Metris – ANDRITZ GROUP Products and Services

HYDRO, PULP & PAPER, METALS, SEPARATION

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SMART Services

eShop

Metris

ANDRITZ GROUP Products and Services



HYDRO



Key Product offerings:

DiOMera

PULP & PAPER



Key Product offerings:

OPP

METALS



Key Product offerings:

AFC
3D-ViSE
Smart Assist

SEPARATION



Key Product offerings:

addIQ

B2B - Smart Services
eShop

Metris

ANDRITZ Digital Solutions



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



Standard Automation solution for hydropower

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”



E.ON dispatch center Landshut

Typical use case

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



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.

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

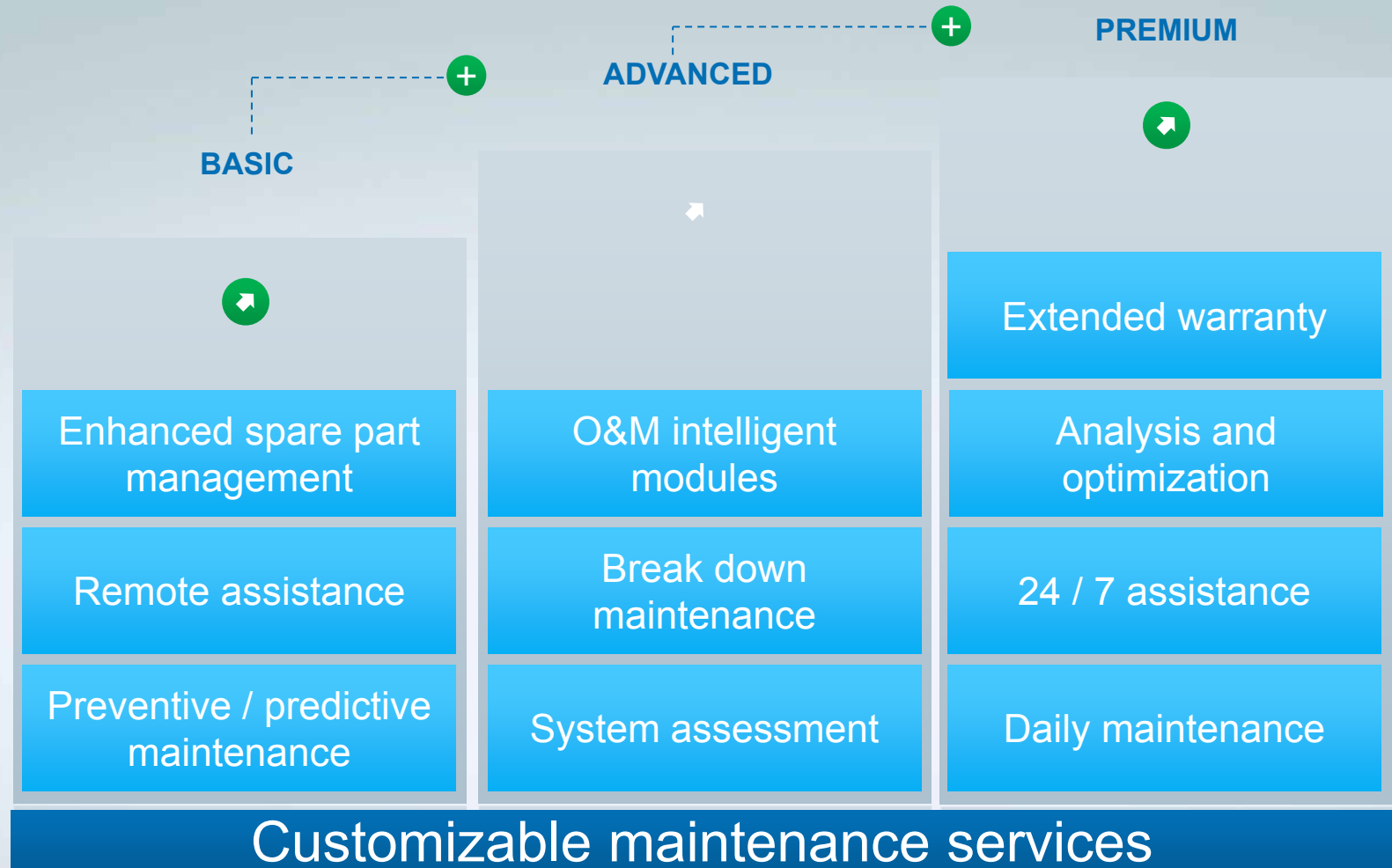
+ Protect the assets' value

+ Manage complex and instable boundary conditions

ANDRITZ can help and support to reduce maintenance costs and optimize power plant operation

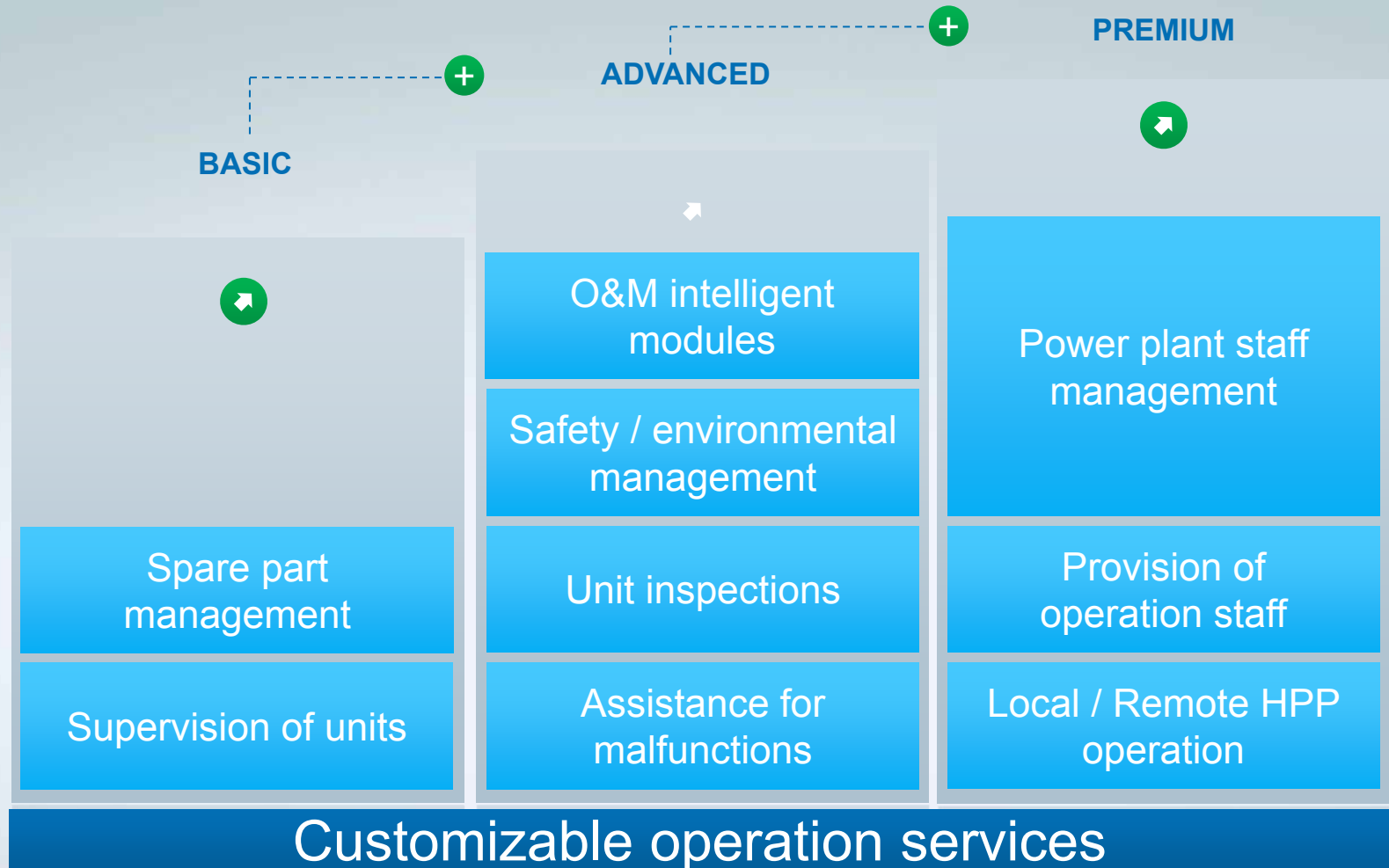
HYDRO – Operation and maintenance

We offer a scalable service concept for maintenance



HYDRO - Operation and maintenance

We offer you a scalable service concept for operation **ANDRITZ**



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



Customer



ANDRITZ
Hydro

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



ANDRITZ
Hydro

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 **ANDRITZ**

Operation and Maintenance solution for

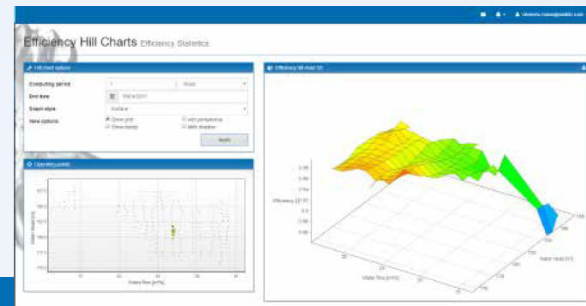
- Each power plant, every size, type, location
- Local / remote operation
- Optimization of production
- Customized acc. customer needs



ANDRITZ HYDRO Control Center Italy

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.

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PULP & PAPER

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



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METALS

Metris Advanced Furnace Control (AFC)

Metals - Product portfolio example



Areas of application:

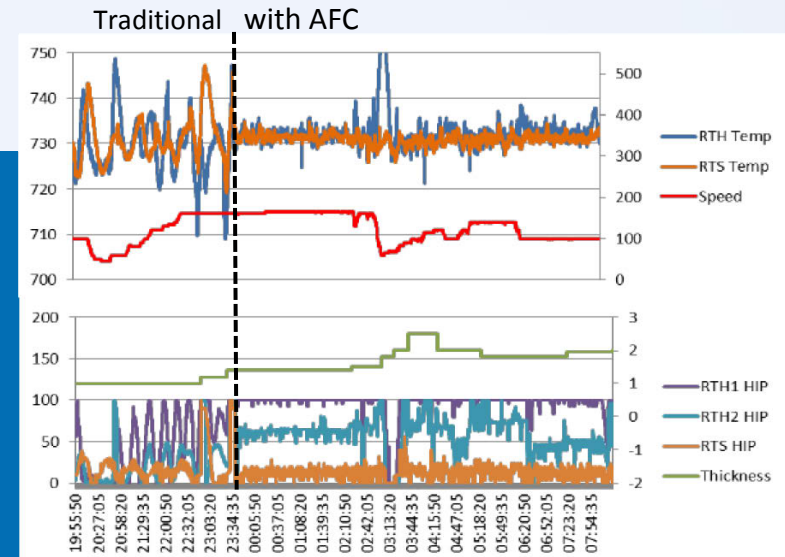
- Carbon and stainless steel annealing furnaces
- Includes both heating and cooling sections
- For direct fired (DFF) or radiant tube heating
- For new projects or revamps
- For any furnace vendor (not bound to ANDRITZ)



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.

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



Traditional vs. AFC control – increased stability of temperatures and gas flow

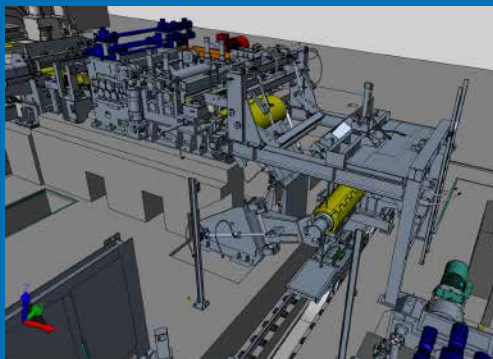
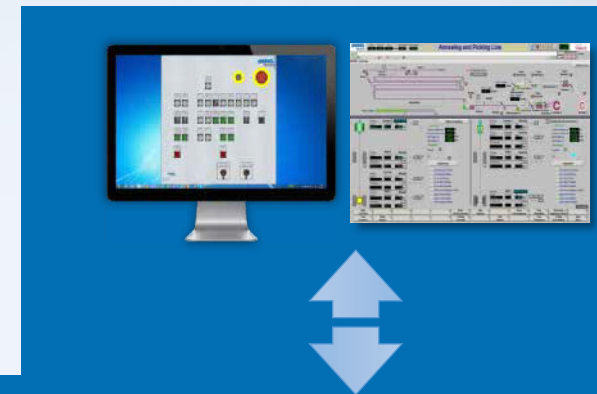
ANDRITZ 3D-ViSE (3D-Virtual Simulation Environment)

Digital Twin of Metal Production Lines (1)

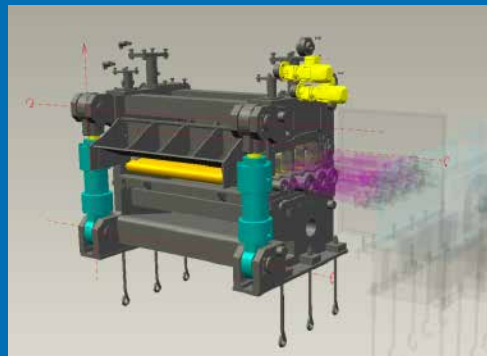


3D Simulation with “Digital Twin”

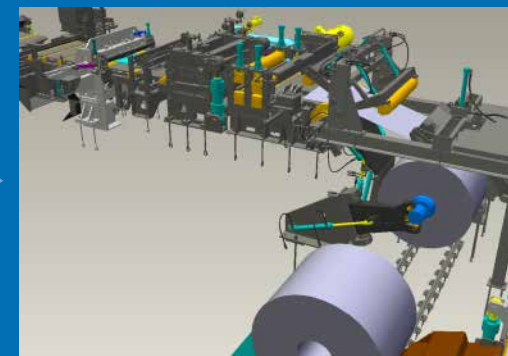
- Independent verification of software functionality (SW FAT)
- Improve software quality during engineering phase and before commissioning
- Higher quality of documentation (e.g. functional descriptions, knowledge database)
- One workflow from concept to Mechanical Design and Electrical & Automation
- 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



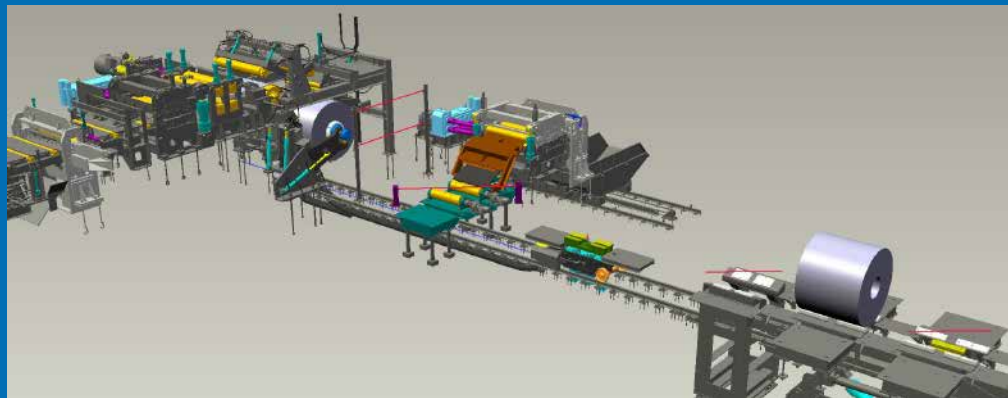
Operation of complete virtual production line (SPS, Virtual Control Panel and L1 HMI)

ANDRITZ 3D-ViSE (3D-Virtual Simulation Environment) Digital Twin of Metal Production Lines (2)



Typical use case

- 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

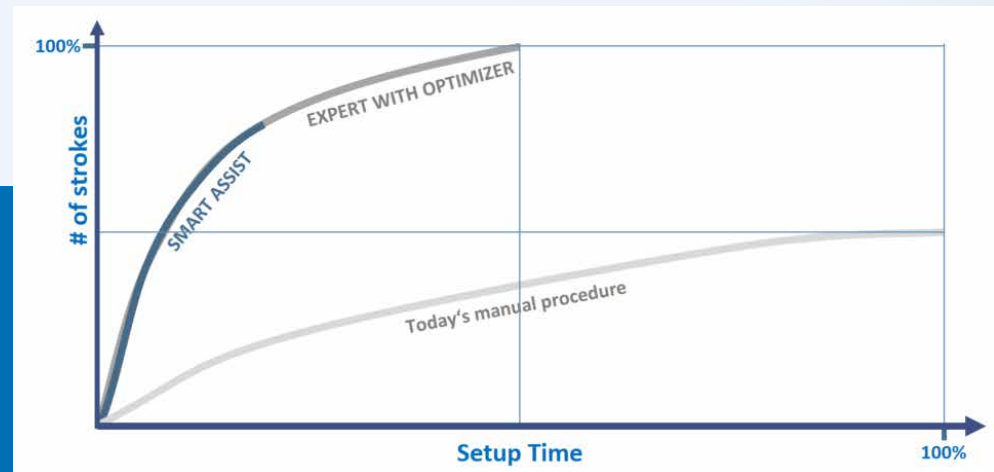
- Setup of presses is highly depending on dedicated and more and more rare experts
- Setup is time consuming due to complex steps
- Manual optimization with step-by-step approach
- Setup time is directly influencing production



Typical Schuler Press

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 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

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SEPARATION

Metris addIQ control systems

Intelligence for machine and process control

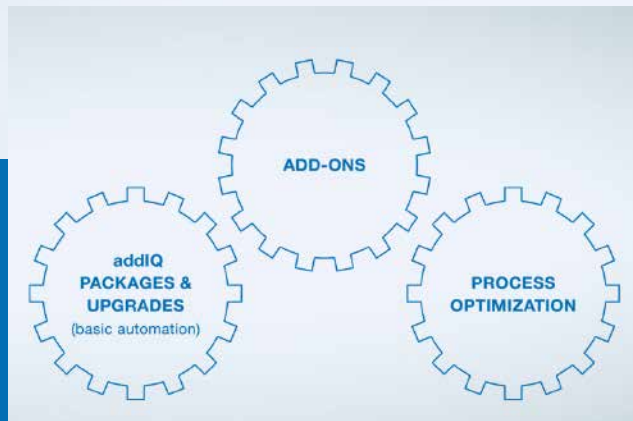


Focus

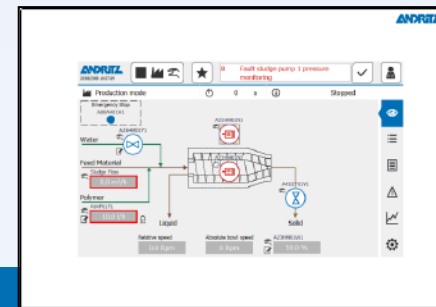
- New Installation
- Upgrades
- Optimization through Automation

Typical use case

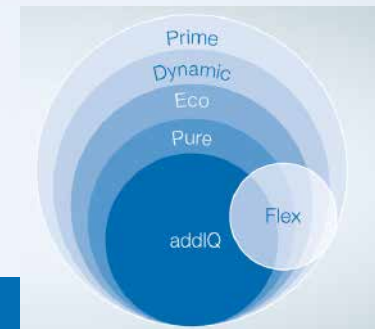
- A family of addIQ packages
- For separation business to optimize operation
- From breweries to sludge treatment plants



ANDRITZ SEPARATION - Modules



Scalability



addIQ control systems for solid/liquid separation

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



ANDRITZ SEPARATION – Training Session

Enhanced Training

addIQ simulation for solid/liquid separation

Metris addIQ simulation the ultimate tool to qualify and certify staff

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eShop

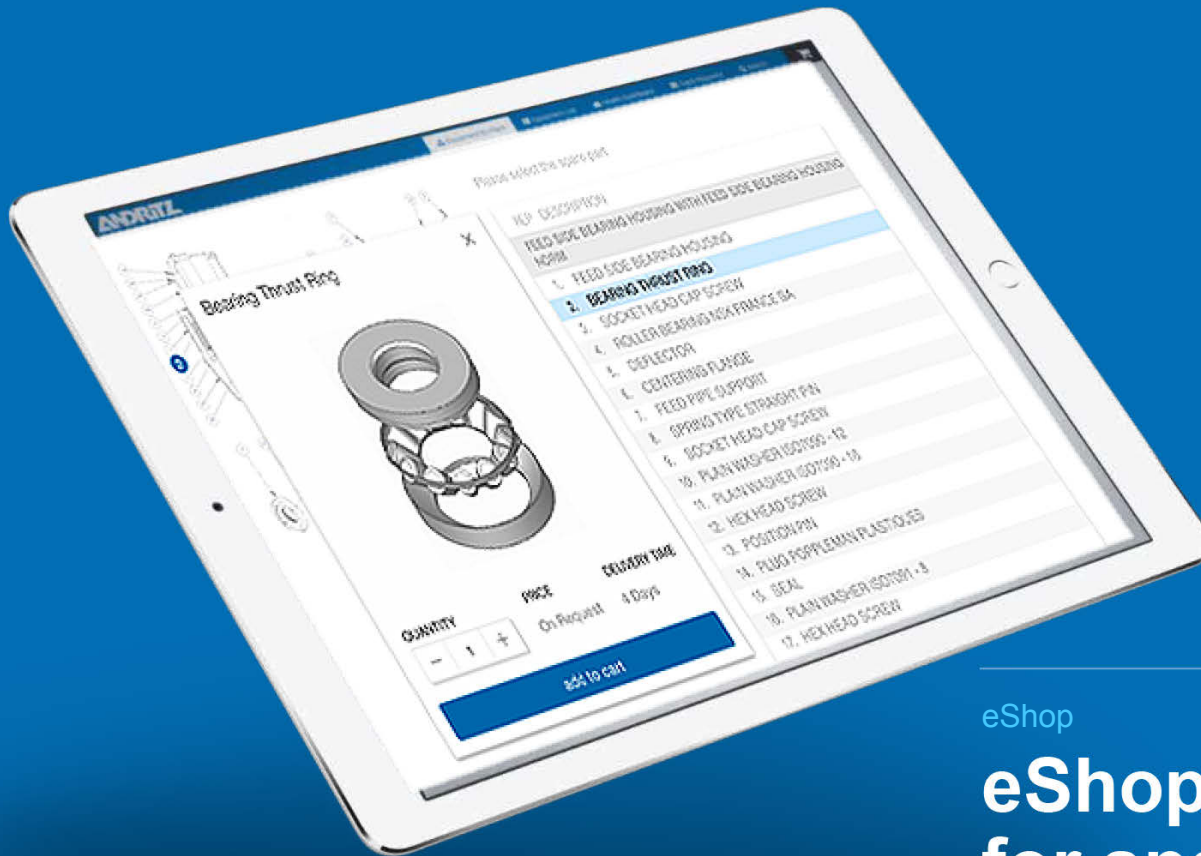
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SMART SERVICE



eShop

eShop for spare parts

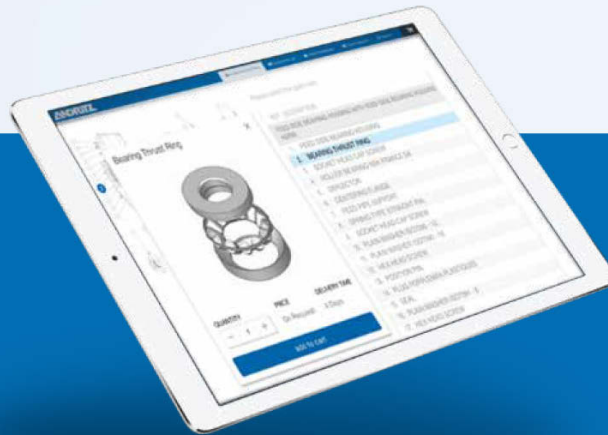
Either using an identification code at the ANDRITZ equipment or directly guided through the user-friendly application you will find the right parts easily.

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



E-Shop

eShop for spare parts

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

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