

# Digitalization is starting to change the industrial world

## Intelligent Filter Press

From higher plant efficiency to preventive maintenance and increased profitability, digital innovation is bringing a variety of benefits to industrial operations. ANDRITZ has combined the power of smart sensors, big data analytics, and virtual and augmented reality to create Metris, a portfolio of digital industrial solutions. Within this portfolio, Metris addIQ control systems offer cutting-edge machine and process control for solid/liquid separation equipment and systems.

Metris technologies can be fully tailored to individual requirements and unite the physical and digital worlds, giving plant operators virtual access to ANDRITZ experts whenever they need them. Its automation solutions range from basic automated movement to enabling machines to recognize changes and imbalances within the process, which can help operators to then optimize operations.



Intelligent packages to improve the filter press – freely configurable to the customer's need.

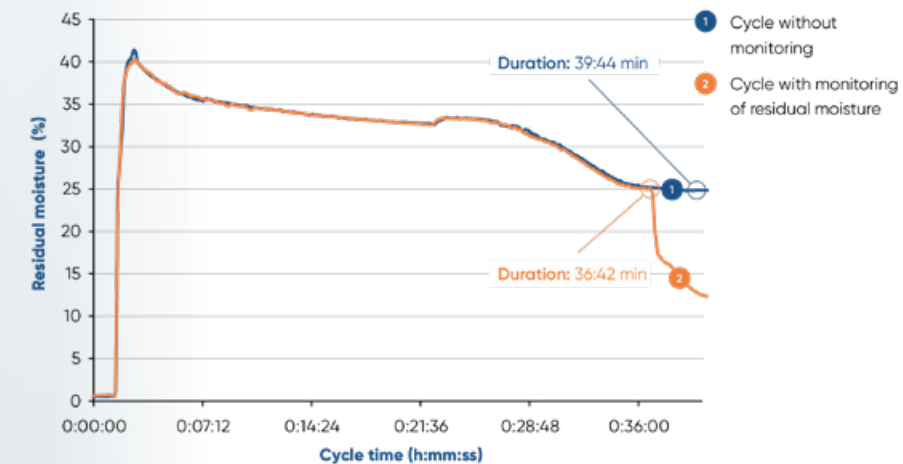
- 1 METRIS addIQ LOAD CELLS
- 2 METRIS addIQ ACE FOR FILTER PRESSES

By combining cutting-edge automation solutions with digitalization, Metris addIQ control systems are able to enhance availability, minimize production costs, increase overall equipment efficiency, and reduce the risk of operating errors, resulting in a high level of reliability.

### COMBINING IIOT APPROACHES FOR AN INTELLIGENT FILTER PRESS

This innovative filtration solution – the ANDRITZ intelligent filter press – offers a wide range of benefits to plant operators. In many processes, the filter cake has to reach a certain defined residual moisture content. This is where the intelligence of the filter press and its Metris addIQ control system comes into play. A sensor embedded into the filter plates enables the moisture content in the cake to

be measured throughout the filtration cycle. This means that filtration can be stopped when the desired residual moisture level is reached, saving valuable cycle time and thus increasing production capacity. As a result, the plant can provide a more consistent residual moisture content in the filter cake.



Graphic illustrating cycle time reduction for an application in the mining and minerals industry

For example, by monitoring the relevant parameters, sensors connected to the Metris addIQ control system can determine when a cloth washing cycle should be triggered.

For an application in the mining and minerals industry, this already meant a cycle time reduction of 8%, as shown in the graph above. This combination of sensors and application-specific control algorithms embedded in the PLC logic is the key to reliable and optimized filter press operation in demanding applications. A sophisticated data analytics tool turns this into information that is relevant during operation. Furthermore, the intelligent filter press monitors the contamination in the filtrate or the hydraulic oil. Besides that, hydraulic and feed pressure as well as the feed temperature are measured and adjustments made where needed. Other values measured are provided by Metris addIQ Monitoring. Trends are collected and alerts issued when deviations from the ideal conditions are detected. Plant operators are informed 24/7 on the status of the filter press and on the key performance indicators.

- 3 HYDRAULIC CLOSURE MONITORING
- 4 HYDRAULIC OIL QUALITY MONITORING
- 5 METRIS addIQ PISTON STROKE CONTROL
- 6 INTELLIGENT CLOTH WASHING
- 7 FILTRATE QUALITY MONITORING
- 8 FEED MONITORING
- 9 LENSER FILTER ELEMENT
- 10 METRIS SmartFILTERCLOTH



Watch the video. For further information about the ANDRITZ AR App see page 2.



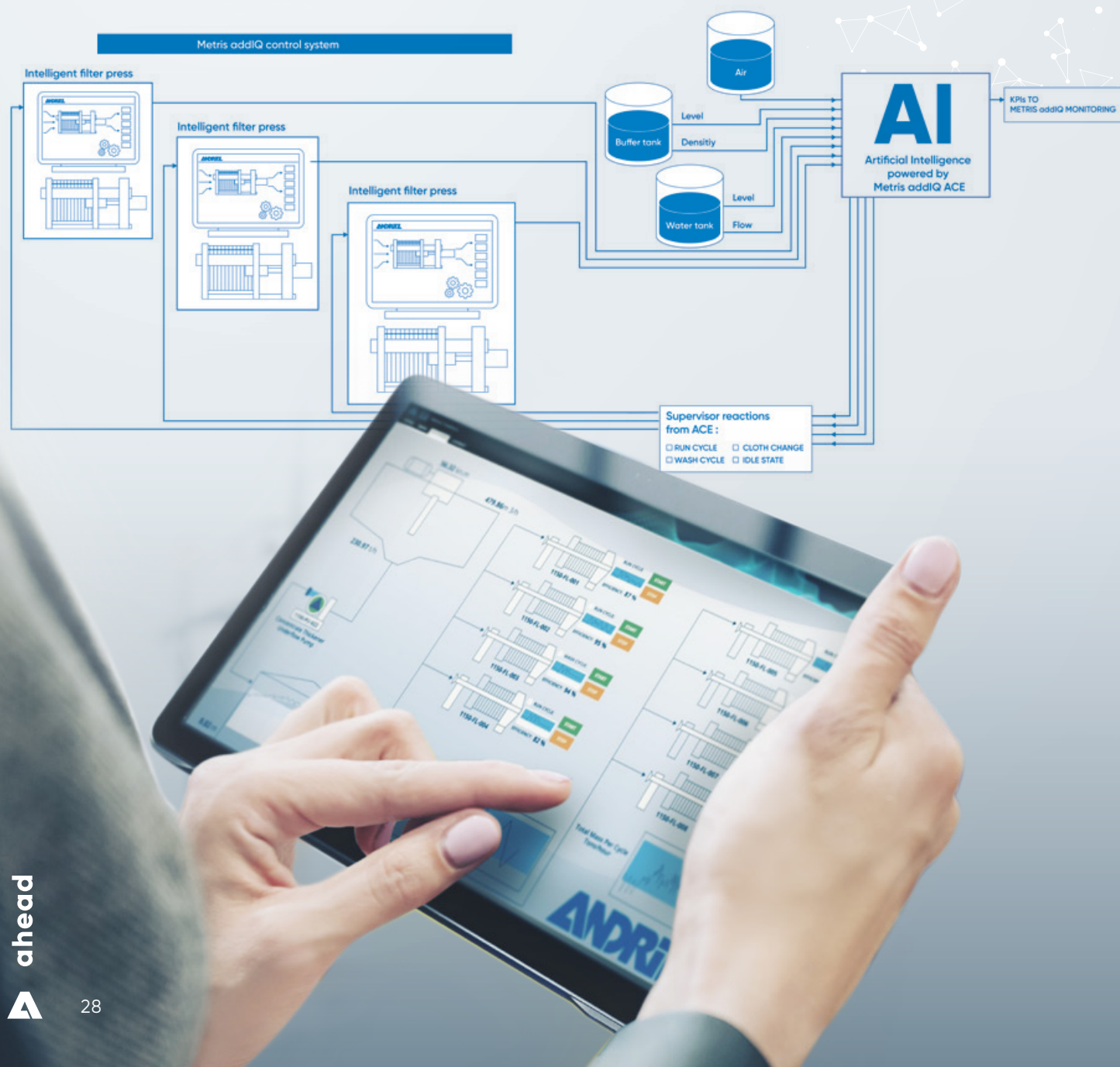
## HIGHEST PERFORMANCE – ALSO FOR MULTIPLE FILTER PRESS LINES

Maintaining an overview of the entire operation becomes a complex task when there are more than four filter presses in a plant. Metris addIQ ACE for filter presses is powered by artificial intelligence (AI) technology so that each machine in the plant is aware of what is happening throughout the entire operation. Metris addIQ ACE looks at operational management of the filter presses as a complete system and is thereby able to optimize ancillary equipment like feed pumps in order to avoid excess power consumption. It is also smart enough to make intelligent trade-offs between availability, filtration efficiency, and throughput. The efficiency of each fil-

ter press is taken into account, information from upstream and downstream operations are collected, and intelligent decisions are made automatically to maximize production throughput, minimize water consumption, and increase overall filtration efficiency. •

### METRIS addIQ ACE BENEFITS

- Automated filter operation for several filter presses
- Maximized filtration throughput and plant efficiency
- Intelligent decision-making for water and power consumption
- Intelligent trade-offs between availability, filtration efficiency, and throughput



## IDEAS Intelligent Control: prize-winning innovation

Following several rounds of intense assessment, including a “shark-tank”-style judgment panel, ANDRITZ’s **IDEAS Intelligent Control** was named winner of the Newmont Goldcorp #DisruptMining competition in March 2019, earning a \$1 million contract with the Canadian company. This came several months after ANDRITZ Automation’s Director of Innovation, Arthur Gooch, won ANDRITZ’s internal entrepreneurial Ventures competition with the innovative technology. ANDRITZ Ventures helps to fast-track and fund the development and commercialization of industry-leading innovations.

IDEAS Intelligent Control was developed with the assistance of entrepreneurial consultants, the ANDRITZ board, and CEO Wolfgang Leitner. It is engineered to create tangible value for ANDRITZ customers using reinforcement-learning artificial intelligence technology. The backbone of its success are three industry-proven components:

The \$1 million prize from the #DisruptMining competition is being used to fund two proof-of-concept projects for IDEAS Intelligent Control: one at a (currently confidential) pulp mill and the other at Newmont Goldcorp’s Pensacito mine in Mexico. •



Left to right: David Garofalo, President and CEO, Goldcorp; Arthur Gooch, Director of Innovation, ANDRITZ; Sohail Nazari, Director of Digital Transformation, ANDRITZ; Rick Mercer, Master of Ceremonies

1. **Artificial intelligence (AI) controller.** As used in many business and consumer applications such as Google, stock exchange trading, and inventory management. ANDRITZ partners with AI specialist PSIORI for this technology.
2. **Reinforcement Learning.** The AI controller is trained by being rewarded for the right action or penalized for heading in the wrong direction.
3. **IDEAS simulation models.** Pulp and paper and mineral processing companies have been using the IDEAS high-fidelity dynamic process simulation models for over 15 years in various applications, including piping and instrumentation validation, dynamic control system check-out, and operator training simulators.