

## ENHANCE OPERATIONS WITH DIGITAL TWIN TECHNOLOGY

# Double your plant insights

Digital twin technology uses real plant data to provide highly accurate process insights. This enables operators to make better and more proactive decisions.

Is the information on your human-machine interface (HMI) enough to run the plant at optimal conditions? Do your key process variables have accurate online measurements? If not, how would you gain these additional insights to make well-informed operational decisions? Metris Digital Twin technology provides answers to all these questions. In its quest to apply these technologies to industrial processes, ANDRITZ has recently customized Metris Digital Twin applications for the pulp & paper, and mineral processing industry sectors.

**DIGITAL TWIN FOR THE EVAPORATION PLANT** is designed to help process and operations teams by using field inputs to optimize online mass and energy balance. This principles-based simulation solution derives many critical process parameters like heat transfer efficiencies, fouling analysis, optimal washing frequency and quality of each wash. In addition, it provides reconciled data for many vital process parameters like Delta T BPR, Solid % for each effect, and guidance on maximum allowable plant capacity.

**DIGITAL TWIN FOR THE WASHING PLANT** offers real-time solutions for the mass and energy balance of brown-stock and pre-bleach washers, as well as the O<sub>2</sub> delignification circuit. The principles-based model calculates critical factors like washing efficiency, Norden efficiency factor, displacement ratio, and soda loss to capture the effectiveness of the washing process. Moreover, the model provides predictions for pre-bleach Kappa and estimates for optimal chemical dosage in delignification towers to guide users towards best possible washer operation.

**RECAUST DIGITAL TWIN** predicts and warns operators of possible plant malfunctions like over- and under-liming. It also predicts critical operator actions such as white liquor filter washing, set points for G/L ratio and optimal slaker temperature to achieve highest causticizing efficiency. The application offers guidelines for inventory management by advising optimal production set points, and digital twin delivers data reconciliation for process instruments like density, temperature and flow transmitters. Digital twin also functions as a virtual sensor for hard-to-measure parameters such as density at critical locations like the slaker, each causticizer, white liquor filter or lime mud filter. The use of virtual instruments can save customers money by eliminating the high installation and maintenance costs of physical instruments.

In the mineral processing industry, **METRIS DIGITAL TWIN FOR OVERLAND CONVEYOR** provides a comprehensive overview of the material transport process. Using input from the live plant, the simulation model can offer reliable early warning systems against such disruptions capacity over-utilization, belt slip, roller jam or belt tear. The result is significantly reduced conveyor downtime and maintenance cost, thus increasing operational safety and equipment lifecycle. The digital twin also provides reconciled data and soft sensor readings for weightometers, and a dynamic loading profile across the length of the conveyor. The application can be extended to a network of conveyors to maximize overall utilization safely and reliably.

## METRIS DIGITAL TWIN TECHNOLOGY

- Solution strategy based on necessary and reliable inputs
- Solution based on live mass and energy balance
- Design equations solved concurrently with accurate thermodynamics
- Predictions based on current plant status with built-in disturbances
- Solution provides numerous virtual measurements without physical instruments
- Solution is developed and supported by process and simulation experts