



AUTOMATION

VIRTUAL PLANT MODULAR TRAINING

SIMULATOR TRAINING FOR INDUSTRIAL PROCESSES

ANDRITZ

ENGINEERED SUCCESS

Safely and expertly train your operators on your process using vPlant Modular Training

Every new operator you hire faces the same challenge: to understand the impact that decisions have on a process. For many trainees, their first opportunity to adjust a set point is on a running plant—but this type of real-life training comes with many risks. Virtual training offers a solution.

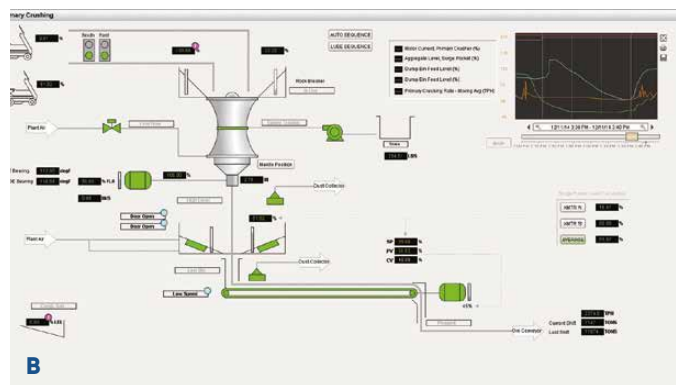
Even the slightest mistake can have a critical impact on your equipment, safety, the environment, and your revenue stream. You can try pairing a new operator with an experienced one, but then your trainee is only getting a limited view of your operation, missing out on the opportunity to see what effect various combinations of set points have on the plant. What your operators need is the freedom to learn in a realistic, yet risk-free environment.

ANDRITZ has the solution—vPlant Modular Training, a package of simulation and software tools for training operators in industrial processes.

Just as pilots learn to fly on flight simulators, your trainees will learn to operate in a realistic simulated environment that will not damage your operation, environment, or personnel.

We build plant control logic right into the simulation model and couple it with a user interface. Best of all, we offer a modular licensing scheme, providing you with a robust and easy-to-use simulator at an affordable price.

vPlant Modular Training will result in better trained operators who will start up processes faster, react more wisely to plant upsets, and improve plant output.



A An operator develops new skills using vPlant Modular Training.
B The training interface is identical to an actual DCS screen.



OUR TECHNOLOGY

ANDRITZ's training package draws on the power of IDEAS, our proprietary dynamic simulator. It's the leading simulator in several industries, including kraft pulp, mining, and oil sands.

IDEAS process models are based on first principles equations. These virtual plants accurately represent chemical reactions, thermodynamics, fluid mechanics, and material transport. In addition, the model responds realistically to operator inputs over the complete range of operational conditions.

IDEAS is more than just a cutting-edge simulation tool. It is supported by a team of development engineers and process experts who have years of hands-on experience at operating facilities around the world.

VPLANT MODULAR TRAINING

- Skills-based operator training system
- Powered by the high-fidelity models of IDEAS
- Available as preconfigured process areas
- All-in-one package; no additional software needed
- Cost-effective solution for existing operations

BENEFITS

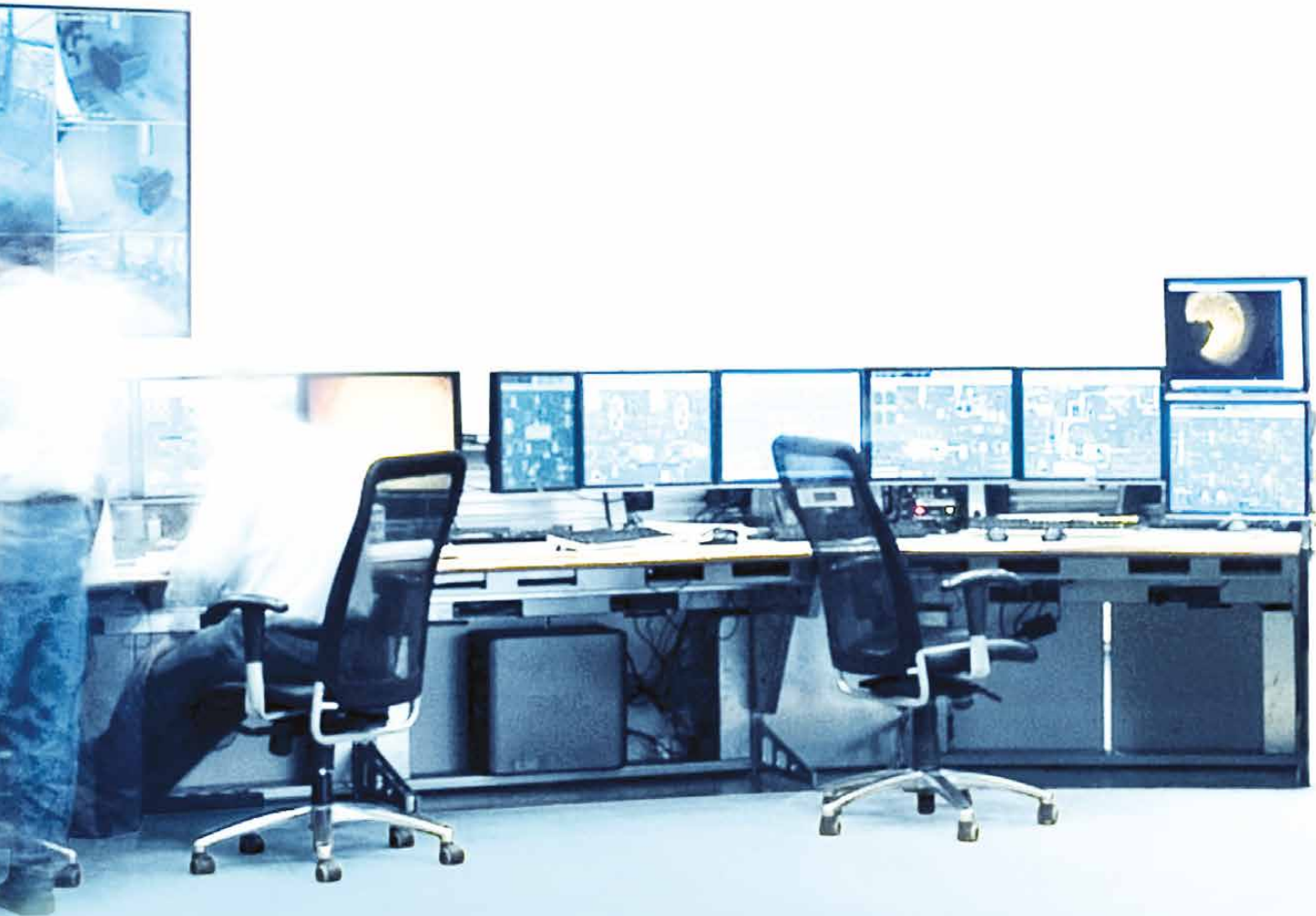
- Teach plant operators safely and reliably
- Have personnel practice intensive and complex procedures
- Connect control decisions to plant profitability
- Visualize detailed internal equipment parameters

"The IDEAS simulation software for our new pulping line gave our operators a head start. The simulation was so close to the actual running of the line that start-up was easy, and the ramping up process was unusually fast."

RENATO GUÉRON

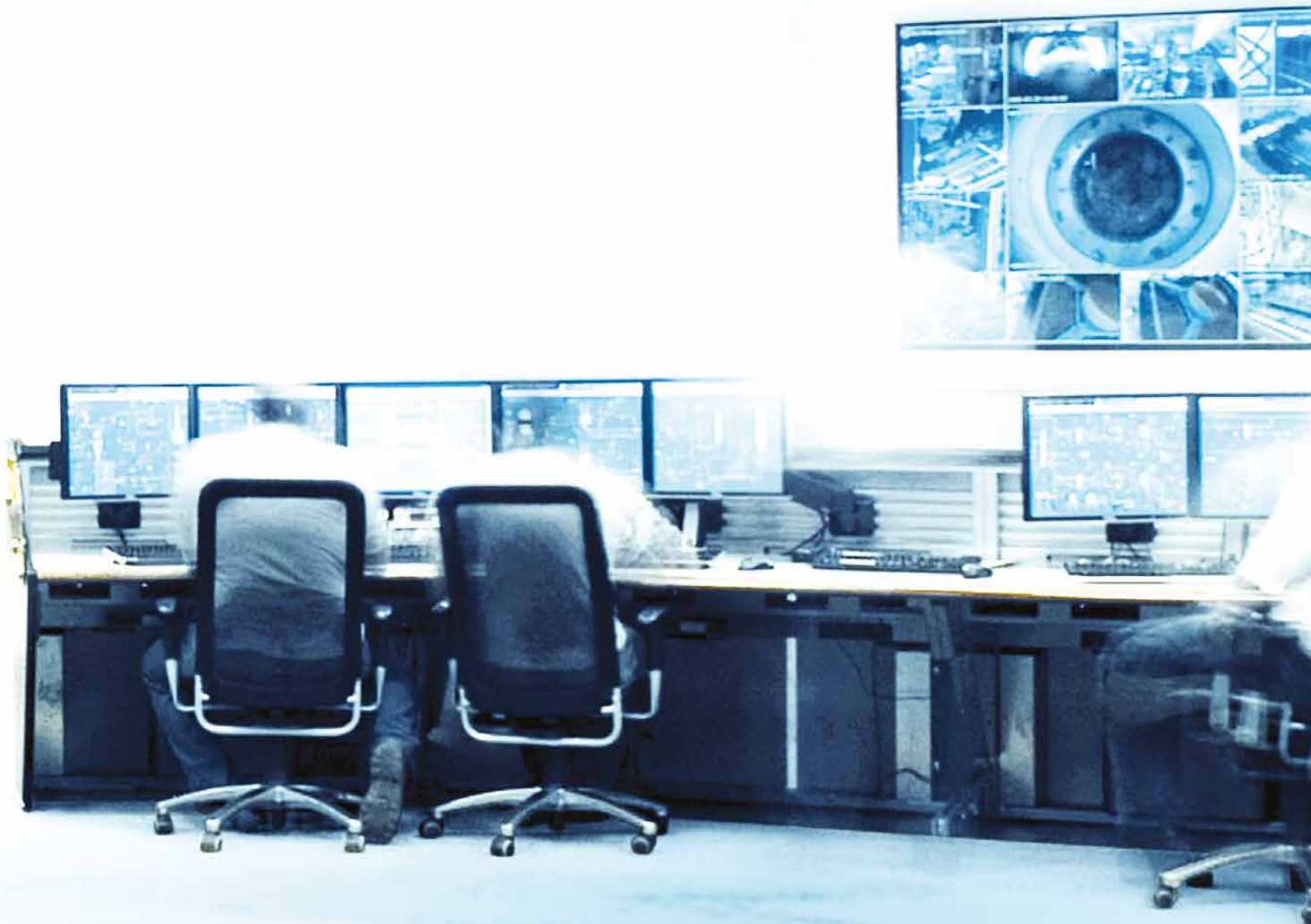
Project Director, Aracruz Celulose





"The feedback from the operators has been extremely good. We've been able to take them through the operating procedures—the more typical ones like start-up and shutdown—but also taking them into process operating regimes, which are undesirable, so that they can also see the consequences prior to start-up rather than on the real plant."

GARY FOULDS, PHD
Shell Albian Sands Project



"The main objective of the IDEAS simulator was to prepare our operators before the opening of the Santa Fe plant. The result was very good; I would say excellent. The users' understanding of the simulation's objectives was very well accomplished, as they made their way out from situations of difficult scenarios of operation."

JAVIER GONZÁLEZ

Project Engineer, CMPC Celulosa

Train operators in a flexible environment, at their own pace

Simplicity is important. Our virtual plant is easy-to-use and accessible to non-technical users. The operator interface is based on Inductive Automation's Ignition software. This platform provides a modern interface for the operator in training. The control logic is embedded in the IDEAS model, removing the need for an emulated controller.

TRAINING SESSION CONTROL

The user interface includes a full set of execution control functions. Trainees can pause or resume the execution of the IDEAS simulator at the push of a button. They can also accelerate the time to observe the results of a decision without waiting for a slow process to respond. IDEAS also allows users to save and load snapshots to restore a process to a certain operating state, or to resume training from a previous session.

OPERATOR EVALUATION

vPlant Modular Training includes built-in tools to evaluate trainee performance against objective criteria. Each testing scenario is defined with a specific initial plant state and objectives that the operator must achieve. Equipment malfunctions can be added in order to increase scenario difficulty. Trainee results are saved to a database, which tracks each user's training history and generates report cards.

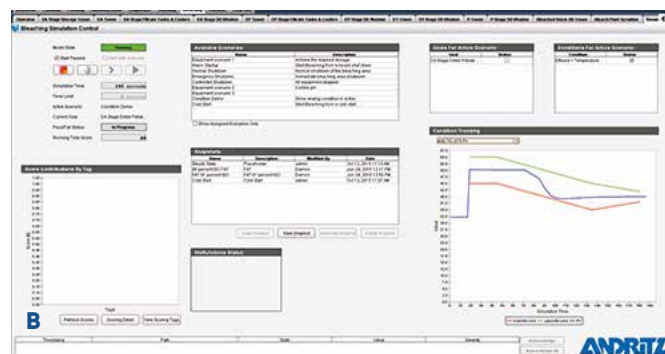
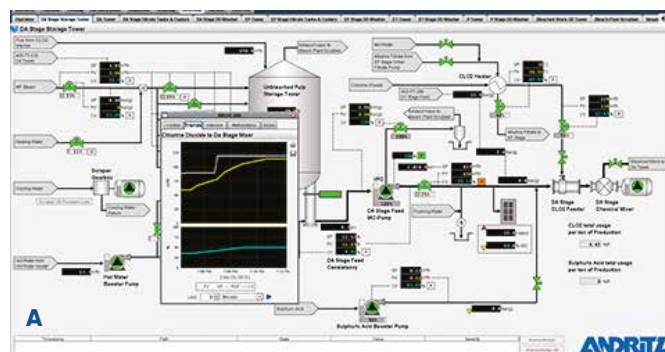
VIRTUAL INSTRUMENTS

Internal process variables that are impossible or impractical to measure in actual plants can be extracted from the IDEAS model and displayed to the operator, just like any other instrument. The operator can visualize the effects of control decisions with more information than is available in an actual plant. Examples of virtual measurements include:

- Lime kiln temperature and chemical composition profile (more than five zones)
- Pulp bleaching Kappa number (displayed between every stage)
- Flotation plant particle size distribution and composition (after every comminution and flotation stage)

KEY PERFORMANCE INDICATORS

The operator's score is based on a fundamental metric: the profit or loss of the virtual plant. Process inputs and outputs are assigned costs and revenues. The financial performance of the process is tracked in real time, teaching the operator to connect control decisions to the profitability of the plant. Financial parameters, such as fuel cost, are adjustable.



A A trend tracks the effect of changing a flow controller setpoint.

B The simulation control page with a scenario in progress. The trend tracks a process value (blue) against scenario-defined limits.



The kiln profiler shows the operator how the temperature varies along the kiln's length.

SPECIFICATIONS

ANDRITZ offers a modular licensing program that allows you to purchase only the process areas needed for your specific operation. All software and configuration files are preinstalled on a VMware virtual machine. The trainer can be run on any business PC with the installation of VMware Player Pro (provided).

Each training package includes:

APPLICATION SOFTWARE

- IDEAS process model
- Ignition user interface

SOFTWARE LICENSES

- IDEAS Dynamic Package (Runtime)
- IDEAS object libraries (industry-specific)
- IDEAS OPC client
- Inductive Automation Ignition Lite
- Matrikon OPC server
- Windows 7 Professional
- VMware Player Pro

DOCUMENTATION AND TRAINING

- Five predefined training scenarios per process area
- Operation manual

OPTIONAL EXTRAS

- Graphics customization to match the look and feel of your control system
- Model customization to match process flows to a particular plant
- Business workstation personal computer, preinstalled with all necessary training system components

“The IDEAS simulator is the core of our Panel Operator Training Program. Without this tool, the effectiveness of our training program would be significantly reduced.”

JEFF LEE

Lead Simulator Trainer, CNRL

FEATURES

- Realistic process response
- Industrial quality user interface
- Pause, resume, or fast-forward execution
- Save and load snapshots of plant conditions
- Launch predefined training scenarios
- Monitor the virtual plant's financial performance
- Evaluate performance with defined testing





WHY WORK WITH ANDRITZ

For over 20 years we've been providing modeling and OTS services to customers across a variety of different industry verticals, offering our customers proven OTS solutions that enable them to achieve their operator training objectives. We can connect our clients with any third-party DCS vendor, as well as develop software, offer flexible commercial models, and provide technical support 24/7 thanks to our global presence.

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