

## Training solutions

to help your operation be always optimal



# The challenge: To get the best out of your most valuable investment—your people



## The solution: Operator training systems

**It's not difficult to imagine this scenario: you've committed significant capital to build a new state-of-the-art process for your plant. The start-up date is scheduled. The market is waiting for your product. And investors are waiting for their return. Somewhere in between are the operators, the people who will actually run the plant. How can you be sure that they know what they're doing? How can you be sure you don't lose critical time in ramping up your process to reach full production on time?**

## **cal time in ramping up your process to reach full production on time?**

That's where ANDRITZ AUTOMATION can help. We offer a range of customized solutions for industrial training that help you get the most out of your most valuable resource—your people. These solutions help your operation and maintenance staff learn in a risk-free environment, making sure they are ready to operate your facility once it's up and running. Our training solutions result in better trained operators—operators who will

start up new processes faster, react more wisely to plant upsets, and be more productive.

Our solutions include web-based training (WBT) and process simulators using IDEAS, one of the world's leading dynamic simulators. Best of all, we provide training in the language and culture of your people. With your vision and our training solutions, your project will achieve operational readiness—quickly, safely, reliably, and ahead of the curve.

## What our customers say

*"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

*"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

*"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. When you are aiming for 2,000 t/d on average, a lot of pressure was put on all of us. IDEAS reduced the pressure dramatically."*

Renato Guéron, Project Director  
Aracruz Celulose



# The challenge:

## To provide in-depth knowledge for all trainees

### The solution: Web-based training

**Web-based training (WBT) provides the most effective and measurable form of training for your personnel. Information about the process is gathered, organized, and delivered to customers so that operators with or without experience can learn in a way that starts with broad concepts, right down to detailed information on specific pieces of equipment.**

ANDRITZ AUTOMATION provides training from the overview level right down to the detailed specifics. Our WBT system is like an interactive operating manual, using a layered approach to deliver knowledge to the trainee.

At the top level, an overview of the process provides trainees with an understanding of the entire operation—and the unit operations



contained inside. More details are unlocked at the equipment, process control, and safety levels. At each level, the trainee is exposed to visual and auditory feedback, resulting in the most efficient learning and knowledge retention. Input-output diagrams, photographs, sounds, process flow charts, and virtual 3D tours combine to involve more of the senses—making the learning experience more engaging and effective. The system includes a testing engine that measures and stores trainee results.

Each level of the WBT system provides various presentation options: 2D, 3D, or 3D plus animation. If 3D maintenance procedures are chosen, then exploded views of equipment are available to give users a clear understanding of how equipment is taken apart and reassembled.

The system can also be used to generate commissioning, start-up procedures, and control room operating procedures. For ongoing operations, critical equipment and spares can also be included. The WBT

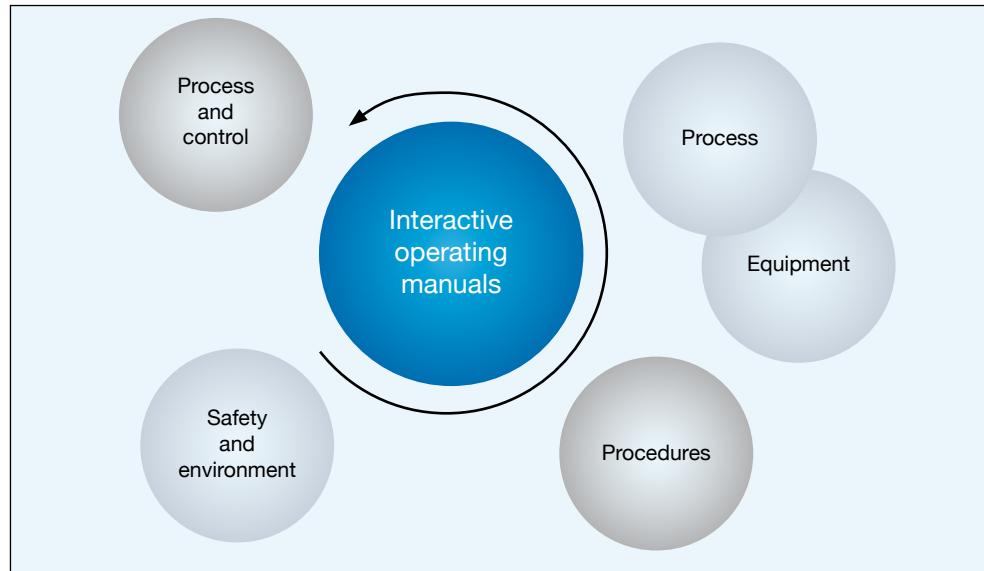
system spans principles of operation, right down to data sheets and spare parts lists.

Training can be delivered by ANDRITZ AUTOMATION in a classroom environment or by customer training personnel—or it can be trainee-led. The material can be on a central computer, a laptop, a tablet, or combinations of all three.

The delivery of a feature- and sensory-rich training system across multiple devices means an accelerated learning curve and higher retention rates.

When combined with the IDEAS simulator, WBT allows a very effective reinforcement of operations knowledge by seeing the procedures first on the WBT and then again on the simulator.

The system is designed so that it can be continually updated, maintaining your investment into the future.



▲ Operating manual contents

#### **ANDRITZ WBT features:**

- Self-paced approach, enabling learners to go through the content at their own pace
- Creation of customized module content, produced in trainee's native language
- Generation of randomized tests
- Immediate feedback to learner as training content is reviewed and tested
- Automatic scoring of tests and records stored in database
- Animation to enhance learner comprehension of complex information
- Ability for administrators to review training records and identify areas that require improvement
- Ability for trainees to send feedback to training administrators
- Interactive online modules in web-based format allow the addition of animation, digital photography, and equipment-specific digital video
- Content presented through the interactive training modules allows tracking and reporting of the trainee's progress



▲ Screen capture showing virtual 3D plant tour in operator's native language



▲ Screen capture showing sequential disassembly operation 3D presentation in operator's native language

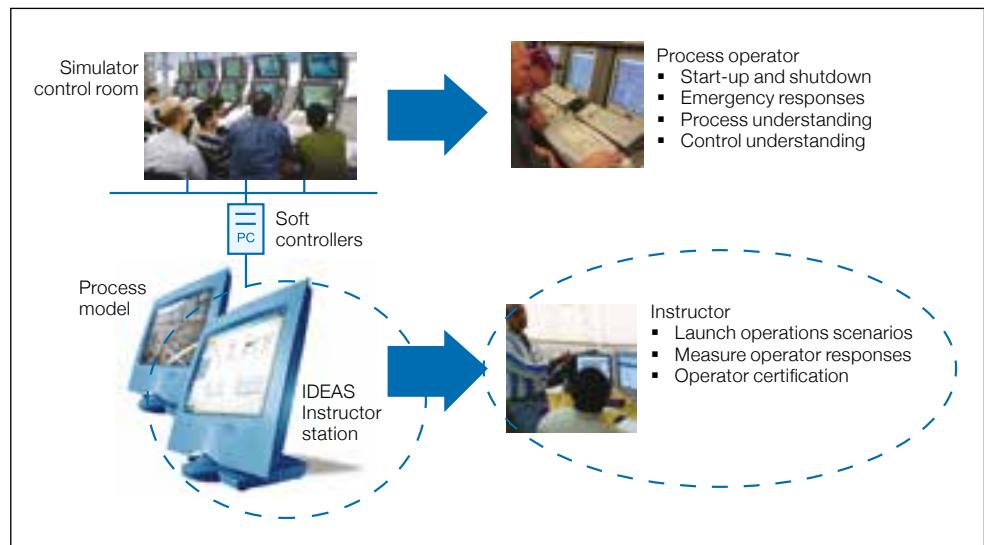
# The challenge: To train your operators on a process—and meet your start-up schedule

## The solution: IDEAS instructor

**IDEAS is an essential tool for operator training; it works like a flight simulator, allowing trainees to gain realistic, hands-on experience without inflicting harm on themselves, the environment, or the plant.**

The IDEAS instructor module can help train operators months before the actual plant is up and running. It helps produce better trained operators—operators who will start up new processes faster, react more wisely to plant upsets, and be more productive.

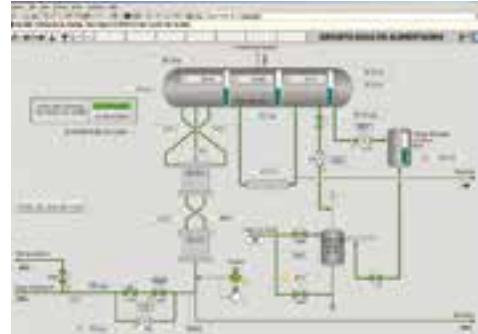
IDEAS instructor contains preconfigured scenarios that teach, train, and challenge trainees on process upsets, including two of the most intensive and complex procedures—start-up and shutdown. We can all imagine this scenario: a relatively new operator is on shift when suddenly a tailings line starts to sand-out. In most cases, such a scenario would have significant safety, environmental, or production consequences—but your new operator, who has practiced start-up and shutdown on the IDEAS simulator, immedi-



▲ Where IDEAS instructor fits into an operator training system

ately makes the correct decisions and your operation continues without incident.

The view from the simulator is identical to the actual DCS screen.▼



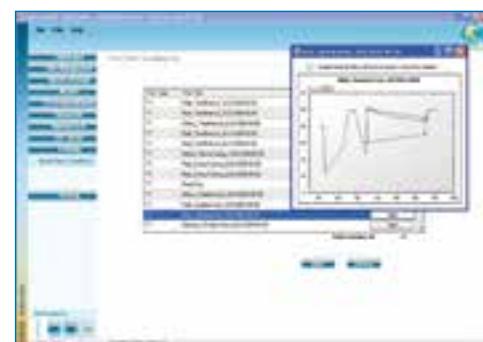
A screen shot from IDEAS instructor demonstrates the easy-to-use interface.▼

## Benefits

- Teach plant operators safely and reliably
- Have personnel practice intensive and complex procedures
- Monitor trainee progress and assess performance
- Standardize and create consistent training

## Instructor interface

IDEAS instructor software enables you to track individual trainee performance, including login and fault scenario management. The operators' performance in executing start-up, shutdown and normal operating procedures is assessed by tracking selected process variables (for example, temperature, pressure, and flow).



## Success story

**Customer:** Antofagasta PLC

### Training objective:

- Train operators in critical process scenarios including pipeline leaking, pipeline plugging, and equipment failure

After experiencing an operational incident at its Los Pelambres mine in Chile, Antofagasta contracted ANDRITZ AUTOMATION to design and build a training system for their concentrate and tailings pipeline operators.

The pipelines needed to be simulated in enough detail for rigorous operator training. The model was built using IDEAS transient pipeline and was verified and tuned using the expertise of a third party, PSI, who actually designed the pipeline. The steady-state and transient results realized by the IDEAS model were verified first against PSI design tools and then against actual plant data.

As a result, ANDRITZ AUTOMATION was able to deliver a one-of-a-kind transient simulation tool that can quickly manage changes in concentration and emulate mineral pulp



batches. The IDEAS model can also be easily converted to a fully dynamic simulation tool.

- Third-party technical school instructors delivering the actual training to each operator

Some typical scenarios programmed into the training package included pipeline leaking, pipeline plugging, and equipment failure.

In order to deliver the product, ANDRITZ AUTOMATION built a state-of-the-art operations support center in Santiago, where Los Pelambres operators could attend an entire training program.

This operations support center consisted of:

- IDEAS models of the pipeline and other remaining equipment
- “Soft” version of the mine’s Emerson control system (DeltaV) connected to IDEAS via OPC
- “Soft” version of the Emerson operator stations
- IDEAS instructor software for managing and delivering the training

The results were very good for the first batch of operators that was trained; not only did the models comply with the PSI verification, but the operators gained valuable experience on a system that accurately represented the “look and feel” of the mine’s actual pipelines.

Due to natural instrument noise, the leak detectors installed in the piping system had difficulties in finding small leaks. Nevertheless, the trained operators are now able to react more quickly, with confidence and accuracy.



# Automation solutions

## Release your full potential



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