

# Virtually simulated

With production high on the priority list, mining companies are using simulation trainers to establish best practice and reduce the chance of human error on site. **Jessica Darnbrough** Writes for *Australian Mining*.

Having a plant go offline or shutdown can be both time consuming and costly. In a bid to lower downtime common with plant shutdowns and maintenance, many companies have begun to install training simulator software.

The simulators effectively train all employees so that they are fully qualified plant operators before day one of operation, which reduces the likelihood of human errors.

Peter Henderson Product Manager of UniSim Operations Suite for Honeywell Process Solutions told *Australian Mining* that operator training simulation software provided companies with more than a device for training employees.

"Simulation training software helps companies prepare their assets in advance so they can ensure they have fully qualified staff, a de-bottlenecked process and functioning controls even before the first day of operation," Henderson said.

"Operators are sufficiently trained in all areas through the use of example problems. This gives them the information necessary to deal with any problems that may arise on site and ensures the smooth running of the plant."

## Smooth operator

When Rio Tinto Alcan (RTA) built the first Australian alumina refinery in 20 years, they wanted a well-equipped workforce ready on day one.

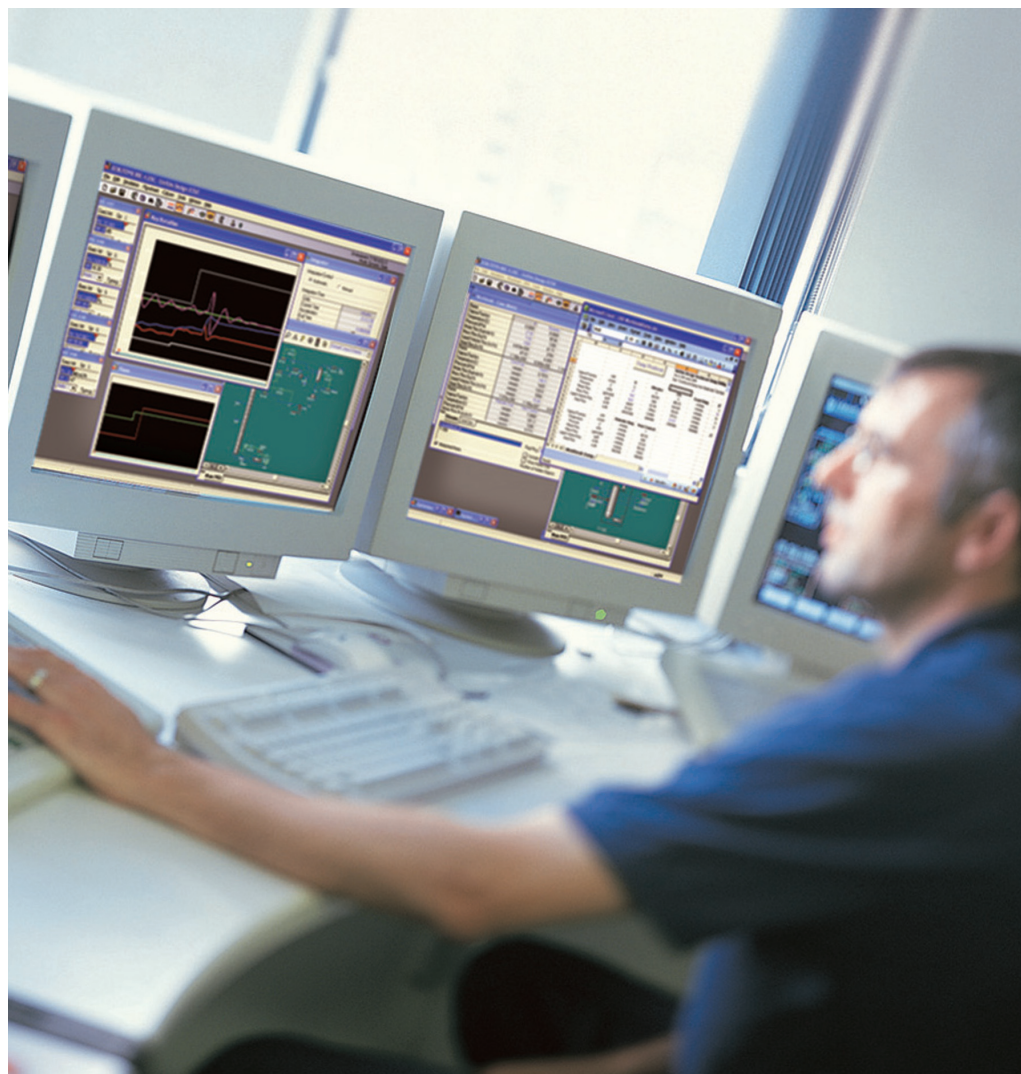
In order to ensure an easy start-up ahead of commissioning, the refinery implemented a complete simulation solution to allow for sufficient time to train operators and test process design, control and logic.

In addition to justifying the need for a simulation prior to commissioning, RTA Yarwun alumina refinery also looked for ways to sustain and justify the simulation solution past start-up.

RTA's superintendent Process Control Terry Snow said simulation technology allowed RTA to employ a well-trained workforce before start-up.

"By employing simulation technology for process model development and operator training, RTA was able to significantly reduce their commissioning effort and employ a confident workforce prior to day one," Snow said.

However, the refinery was able to achieve more than a well-trained workforce.



Simulated training software helps employees become fully qualified plant operators before day one of operation.

The refinery was also able to identify and test issues before any real problems could arise, which then led the refinery to create and refine accurate and best practices to be applied on day one. Extensive testing of processes before start-up resulted

in smooth and trouble free commissioning.

According to Snow, the biggest challenge the site faced was establishing a well-trained workforce that would be ready for the initial operation, with the knowledge on how to minimise any

start-up difficulties. "We knew what would work at our refinery and looked for a proven solution that enabled our staff to have access to best in-class technology," Snow said.

"We also needed to give operators the freedom to help develop their own simulation scenarios."

"From our perspective, there was no difference between the live and the simulated environment. This helped the operator trainee to quickly build up the confidence they needed to face real system."

RTA used a gamut of Honeywell's simulation tools.

In the training model development at RTA Yarwun, the entire refinery was split into four models, bauxite processing, hydrate processing, boiler and calcinations.

Each model was then connected with real Honeywell control hardware and software.

According to Peter Henderson of Honeywell, the simulation software was built to suit the site's specifications. "The simulators are as realistic as we

can possibly provide them," Henderson said.

"Each simulator shares the same fundamentals of a real plant. However, today we can go one step further and scale the fidelity requirements to suit each of the customer's needs."

## The future is now

Honeywell's vice president of technology Jason Urso said the biggest improvement in simulation software over the last few years has been an increase in the level of fidelity.

Simulators can now accurately reflect the conditions of a real process control centre.

"It is of critical importance that the software is true to life. There are still course simulation software packages available, however, these will not give the operator the true feeling of what it is like to operate a plant on a day-to-day basis," Urso told *Australian Mining*.

According to Urso, simulators are highly underused by mining companies. Often, they are installed out of necessity to train new operators and refresh current employees.

"Simulation has a great deal of opportunities beyond just training and refreshing the skills of personnel," Urso said.

"The simulation software currently on the market is ideal for trial and error applications. Engineers are able to trial the effectiveness of new instruments and new techniques and receive accurate data without a backlash of consequences.

"Simulation will continue to play a big role in plant management and maintenance. It will not only continue to aid the skills shortage crisis and help train and update the skills set of personnel, it will also help plant managers optimise the facility on a day-to-day basis."

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Honeywell offers a simulation training software package to companies that will not only train employees but will also help them prepare their plant assets in advance.