Honeywell’s operator training solution for Pertamina’s Balongan Refinery shows the power of synergies. Combining Honeywell’s powerful UniSim® simulation software with UOP’s proprietary process knowledge helped achieve a safer, more efficient operation.

**Background**

Pertamina is the largest oil and gas producer in Indonesia and among the largest companies in the world, as part of the Fortune Global 500. State-owned, it operates six refineries across the country.

These include RU VI Balongan on the northern coast of Java Island in the province of West Java. Established in 1995 and processing 120,000 bbl crude per day it is one of the country’s largest refineries.

Pertamina has continually sought to improve the refinery, with the first phase of a revamp increasing capacity in 2003, new units for platforming and isomerization were added in 2005, and the second phase of a revamp to improve the flexibility of the refinery completed in 2008.

Pertamina’s vision for operational excellence is underpinned by a production system based on eight pillars that focus its drive for improvements. These include management of HSSE (health, safety, security and environment), reliability and maintenance, technology and human resources. Underpinning these headings are a wide range of commitments to process safety, reliability and integrity management, plant operations management and people development.

Honeywell’s operator training simulator (OTS) solution has been central to Pertamina’s efforts to ensure its vision is realized. Bringing together Honeywell Process Solutions’ advanced UniSim® Competency Suite simulation software with the refining technology of Honeywell-owned UOP, it has implemented a structured, consistent and effective training solution.

**Challenges**

Honeywell and Pertamina performed a site survey in July 2008. This showed Pertamina’s operator training was largely performed by skilled, senior operators through classroom sessions and on-the-job training.

The effectiveness of this informal, mentor-led program depended heavily on the experience of the senior operator, who was largely responsible for leading the training. Qualifications awarded to trainees were also open to subjectivity, relying on the judgment of the course supervisor.

Most importantly, retirement and competition for talent from the Middle East made the sustainability and quality of the training vulnerable to the loss of skilled operators to lead it.

Based on the findings, Pertamina concluded it needed to overhaul operator training to a sustainable footing. This would ensure consistent standards, capture knowledge from its aging workforce, and promote the site’s safety, reliability and efficiency.

In developing a professional development program to manage operator competency management, Pertamina decided the more structured operator certification program should be underpinned with an OTS solution.
To be effective, these simulators must accurately reflect the behavior of the reactor; include realistic scenarios that would enable trainees to practice corrective action and improve troubleshooting; allow instructors to judge operators objectively through a systematic assessment; and be tailored to trainees’ requirements, particularly through accommodating the local language, Bahasa Indonesia.

**Solution**

Honeywell provided Pertamina with a comprehensive simulation-based training program, with workbooks and assessments customized for the refinery’s equipment, flow rates and tag names.

The solution leverages Honeywell’s simulation expertise developed for more than 30 years and UOP’s proprietary know-how for an OTS solution that is uniquely faithful to the actual process.

Honeywell’s UniSim software provides a real-time dynamic simulation and user-interface, which mirrors the HMI of the DCS, along with preconfigured training exercises and the ability to capture training records. This is supported by simulation models of the platforming and CCR process units built using data from UOP to recreate its proprietary reaction kinetics and logics, which also are used to validate the responses of the OTS.

UOP’s input therefore informed the process design, reactor models and proprietary logic sequences. Its experts also developed a training curriculum by identifying common operational scenarios and developing workbooks and key performance indicators. Honeywell was able to deliver the simulation model and training simulator along with two design cases (a lighter feed case and heavier case) and 44 scenarios with detailed workbooks, detailing corrective actions for operators.

**UniSim Operations** and UniSim Curriculum take trainees through a well-structured training program in their local language. Trainees begin with basic training, introducing the DCS displays and process information; progress to intermediate lessons on start-up and shutdown procedures and upset scenarios; and finally complete advanced training on emergency responses.

The workbooks also include assessments that provide the basis for Pertamina’s Operator Qualification program and allow Pertamina to certify DCS Board Operators.

**Results and Benefits**

Combining Honeywell’s simulation expertise with UOP’s process knowledge, Honeywell delivered realistic OTS solutions that allows Pertamina to improve its management of people, safety and efficiency at Balongan. The delivered OTS solutions are UOP Platformer™ with Cylemax™ OTS and UOP Reduced Crude Conversion (RCC) OTS.

“Judging from the application of the delivered OTS solutions in Pertamina Balongan, by choosing a custom simulator from Honeywell and UOP we were not simply buying an equipment package; we were investing in a technology transfer that benefits operation reliability, on-steam efficiency and optimization,” said Budi Santoso Syarif, General Manager at RU VI Balongan. “With UOP, Honeywell is able to combine the intellectual property that drives the process with powerful simulation and training tools.”

A defined curriculum, workbooks and assessments ensure consistent training and objective certification standards. Operational knowledge, meanwhile, has been effectively captured and retained in the training program.

The scenario-based training helps operators recognize and respond effectively to incidents more quickly. This helps prevent equipment and catalyst damage, reduce maintenance requirements and cut environmental emissions. It also enables Pertamina to secure lower insurance premiums. The training has also improved operating performance, equipping operators with the ability to ensure consistent product quality and increase process efficiency.

Pertamina hopes to replicate the success of the project, with plans to introduce the UniSim Competency Suite at other sites.