

CUSTOMER CASE STUDY

Operator Training Simulation Solution Strengthens Operator Skills, Improves Safety and More

Fauji Fertilizer Company
Industry - Chemicals

Goals

- Train personnel on the newly-commissioned DCS to reduce operational incidents, increase uptime and equip operators to respond to emergencies
- Maintain a high level of performance for experienced operators and new hires alike
- Quickly and effectively prepare new plant operators to work in actual control room and field environments

Challenges

- Engineers had to be trained and tested through simulations for emergency scenarios as the well-run plant had infrequent chances for on-the-job training
- Expected retirements and attrition of existing workers will require many new operators to be trained quickly

AVEVA Solution

- SimSci™ DYNSIM®
- SimSci SIM4ME™
Common Modeling Environment
- SimSci FSIM Plus™
- SimSci TRISIM Plus™

Results

- Within the first year, 22 FFC engineers have become Operator Training Simulator (OTS) instructors and conducted 130 training sessions
- Plant operators have benefitted from best-in-class training and are empowered to respond confidently and consistently in real time
- Training time has decreased from years to months
- Unscheduled shutdowns are significantly reduced, plant startup and shutdown is more efficient

Goth Machhi, Pakistan – Since 1982, Fauji Fertilizer Company (FFC) has provided premium quality fertilizer products to their commercial customers. As one of the largest manufacturers in the country, the operation produces 551,000 metric tons of urea and 445,500 metric tons of diammonium phosphate (DAP) annually. Production facilities encompass three plants. The FFC vision is to achieve excellence in every aspect of plant operation, which is tied to benchmarks of safety, reliability, efficiency and environmental sensitivity.

An Opportunity for OTS

In 2011, when it came time to commission a new Distributed Control System (DCS) in FFC Plant-I, the company saw an opportunity to realize a number of important benefits. First, a new DCS would advance the plant from conventional analog into the modern era of digital control systems and increase productivity and uptime. Plus, with the addition of an OTS, it would enable FFC to institute an entirely new plant-wide training protocol that would positively impact overall operations.

Management envisioned the OTS would:

- Decrease the risk of major operational incidents
- Reduce startup and downtime
- Increase the plant's on stream factor
- Improve efficient handling of emergencies

Planning for the Future of Personnel

Alongside plant efficiency, FFC was analyzing manpower challenges. Like many manufacturing businesses today, FFC's workforce is experienced. So the company needs to plan for upcoming retirements and anticipate a higher attrition rate.

Another FFC situation, common to most manufacturers, is that operators get the bulk of their training on the job. So how can new hires be exposed to critical and emergency scenarios that happen only infrequently? How can engineers be effectively trained when business goals dictate that plants must be kept running smoothly and efficiently?



Setting High Expectations

An OTS system was the answer for FFC, but expectations for such a system ran high. Project leaders set these key requirements:

- The OTS must provide a high-fidelity, virtual process model that would behave similarly to the real production plant. Operators must experience lifelike situations during their training.
- The HMI must be identical to the control room operator stations with the same graphics and interaction options.
- The OTS must allow control room and field engineers to train together. It should increase the skill level of existing operators as well as prepare new operators for their jobs.

The FFC team researched the market and created a detailed RFQ, which was sent to a list of vendors including Honeywell (Advanceon), Aspen Technology, Emerson Process Management and Schneider Electric. The team selected Schneider Electric because its OTS implementation offered:

- A direct-connect system with no requirement for translation, emulation or recompilation of the system configuration
- A technically superior process and system model
- High fidelity with an accuracy level of +2% PFD value
- Strong technical and engineering expertise with long-term maintenance support



“Our preparedness level has improved by many folds. Now both newly-trained and experienced operators have gained a lot of confidence. They are well-prepared to handle the plant in normal operation, startups/shut downs and in emergency situations.”

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Mubashar M. Butt,
Deputy Manager Production

FFC also chose the Schneider Electric Foxboro® I/A as their new DCS with the Triconex® Tricon™ Emergency Shutdown Safety System (ESD). So Schneider Electric could easily and efficiently integrate the OTS control configuration, graphics, operator consoles, shutdown configurations and other elements as part of the DCS deployment.

Cooperation Cultivates Rapid Deployment

Another benefit in working with Schneider Electric came from regional expertise. A team from Schneider Electric’s China office hosted FFC production and process engineers for a visit to kick off the development of the OTS process model and participate in an initial training session. This improved the final product because the range of plant scenarios and emergencies was defined and discussed up front.

This data-gathering step was also crucial for adhering to the aggressive project timetable. FFC required the OTS to be designed and deployed in conjunction with the installation of the new DCS. But accuracy of the models and simulation could not be sacrificed, even though the development and testing was completed in only about 12 months.

Ammad Ghafoor, BDM, Software Solutions, Schneider Electric says, “The Fauji Fertilizer Company and our team worked closely together throughout each phase of the project. This collaboration was a critical element of our success and translated efficiently into the final solution.”

Best-in-Class Outcomes

The FFC plan centered on a “train the trainer” approach. After successful installation of the OTS, the first step was to train two lead engineers: one urea board man and one ammonia board man. These operators completed training alongside their normal shift duties.

Then, over the course of the first year, FFC conducted 130 training sessions. FFC now has 22 OTS instructors who come from all three of the plants. A total of 93 managers and staff members have been trained via the OTS so far.

Fauji Fertilizer Company’s Deputy Manager Production Mubashar M. Butt says, “The flexibility of this system allows us to simulate any plant emergency any number of times, which has helped our people understand how to respond. They’ve been able to memorize the correct critical actions by repeating them again and again.”

FFC is attaining measurable results. The number of unscheduled shutdowns has been significantly reduced, along with emergencies and unplanned startups. Operators are responding confidently and consistently, because they’ve had virtual experience with almost every possible disruption through their OTS experience. Mubashar M. Butt says, “Operators performed remarkably well after training, even during their initial days of independent duty on the control board. With the Schneider Electric OTS, we’ve achieved steadiness in plant operation, we’re training people more rapidly and it’s supporting our continuous development efforts.”

Thanks to the OTS solution from SimSci by Schneider Electric, the FFC operator program is both effective and popular. And even more important, the company is seeing improved and safer plant operations, and living up to the corporate vision.