

# Creating operators with a real “feel” for manufacturing

In May 2006, we set up a Plant Operation Technology Training Center at Mitsui Chemicals' Mobara Branch Factory in Chiba prefecture to provide training for chemical plant operators.

The center forms part of our frontline manufacturing operations at Mitsui Chemicals, handling everything from planning training for human resources on the shop floor to organizing actual training using hands-on training facilities.



## The contradiction between evolving plants and manufacturing on the shop floor

Petrochemical plants have gone through a series of changes as they have become safer and more sophisticated, from the large-scale expansion of facilities during the 1960s and 70s to the switchover from analog instrument panels to computer-based distributed control systems (DCS) in the 1980s. As we have made more and more progress

with automation and improved safety measures, however, operators have found themselves having to resolve fewer problems. This has created something of a contradiction, in that operators these days lack the well-honed sensibilities and expertise that they would previously have gained by dealing with problems.

Over the last decade or so, we have been building more plants in other countries than in Japan, in an effort to remain internationally competitive. This means fewer opportunities for operators to get involved in the construction process and learn about the structure and basic principles behind a chemical plant, which are the cornerstones of manufacturing.

As a petrochemical manufacturer, this contradiction is having a direct impact on our manufacturing capabilities. The so-called 2007 Problem, brought on by the mass retirement of experienced operators from the baby boom generation, has made matters even worse.

Having previously focused on standardizing plant operations and technical standards ever since Mitsui Chemicals was established in 1997, following the merger between Mitsui Petrochemicals Industries and Mitsui Toatsu Chemicals, the final frontier on the shop floor was to train the operating staff

who work on the manufacturing frontline. In order to make the on-the-job training (OJT) schemes already in place at individual works more effective, we established an educational framework and created a new system whereby the Production & Technology Center would take the lead in organization training, using full-scale hands-on training facilities. The result was the establishment of the Plant Operation Technology Training Center in 2006.

“Our aim is to act as the cornerstone of manufacturing at Mitsui Chemicals, by producing operators with strong all-round skills, from operating machinery to safety and equipment”, comments Plant Operation Technology Training Center Director Yasushi Handa, who has been in charge of the project from the beginning.

## Learning about the structure and principles behind safety and equipment through extensive hands-on training

Occupying an area of roughly 10,000 square meters in one corner of the Mobara Branch Factory, the Plant Operation Technology Training Center features a methanol distillation training plant, training apparatus for basic operations, a DCS control room and cut-away models of a wide range of plant components. Training is provided by a



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- 1 Trainees listen intently to learn about liquid exposure and liquid seal at a safety experience facility
- 2 Classroom discussion sessions also provide an invaluable opportunity to learn about measures implemented at individual plants and works, and for trainees to share their experiences
- 3 Actually simulating a sudden drop or fall using a safety harness



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team of 13 instructors and is aimed at around 2,000 operators at Mitsui Chemicals' six domestic works and operators working at overseas plants. In the five years since the center opened its doors, a total of 2,000 operators

have undergone training, with a further 200 trainees and guests visiting from other countries.

As an example, domestic operators have to come to the center four times; once when they joined the company and then again after six months, three years and seven or eight years. Although individual training sessions cover a wide range of topics, including safety skills in the event of an accident, explosion or fire, practical operating exercises using training plants, and the structure and principles behind items of machinery, the one common factor throughout is an emphasis on hands-on training. "We use a range of safety apparatus to simulate accidents, by lifting trainees up in harnesses around their waist for instance. We try to encourage a high level of sensitivity to safety issues, as well

as training operators to question why things happen for themselves." (Handa)

Handa has also devised a curriculum that aims to hone trainees' sense of awareness even further. This involves "training human resources so that they are capable of identifying weaknesses in their own plants and coming up with solutions."

"The culture within each plant is shaped and molded by key members of staff at that moment in time. We want operators to create a new culture for themselves, one that isn't overly focused on the past. Unless we try to achieve that, we will never be able to provide manufacturing support for overseas plants in a global era." (Handa)

**Human resources capable of identifying weaknesses and finding their own solutions**

It is Naoshi Hagihara's job to take on board Handa's ideas and plan training for domestic operators. In addition to identifying trainees' needs, he also has to carefully align them with the company's own requirements. "Our aim is to train operators to think for themselves, so we always try to produce a curriculum with an emphasis on understanding why things happen. At the end of the day, however, the first thing we have to do is to make the center appealing enough

that trainees want to come back."

Takashi Fujibuchi meanwhile, who is responsible for planning training for overseas operators, explains that "we are planning to set up training facilities at one of Mitsui Chemicals' plants in Singapore before the end of 2011 so that we can roll out activities into Southeast Asia as well."

As people often assume that chemical plants are fully automated, with no intervention required from human operators, they don't tend to associate the petrochemical industry with manufacturing. That is precisely why we need as many operators as possible who have a real "feel" for everything from operating machinery to safety and equipment. That is the only way to lay solid foundations for manufacturing.



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