



Case Study September 2002

Excellence in Workplace Literacy, Small Business Winner, 2002 National Silicates

OVERVIEW

The National Silicates' Chemical Process Operator (CPO) program began in 1995 when it and four other industrial chemical companies realized a common need to upgrade the skills of their employees. Upon discovering that the five companies shared similar training needs—having common production techniques, machines, and health and safety concerns—the group decided to combine their efforts and co-operate in developing a unique training program that addresses the generic and technical skills required by their industries.

The primary objective of the CPO program is to upgrade the skill levels of plant operators and to enable them to be multi-skilled and competent in all areas and on all machines within the plant operations. The CPO program—a 6,000-hour, in-house training program made up of 90 interactive CD-ROM modules and an

extensive hands-on training practicum—was chosen for the Award of Excellence because of the successes that the National Silicates' Toronto plant has enjoyed. To date, three of the plant's 19 employees have completed the CPO program, five are nearing completion, and two more will sign up shortly. Employees have increased

Effective practices in providing training and supporting workplace learning.

A core product of the National Business and Education Centre

Name of Program

Chemical Process Operators Program

Program

Workplace

Date Established

1997

Skills Developed

Machine operator skills
Technical skills
Numeracy and language skills
Problem-solving and critical-thinking skills

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their basic skills in numeracy, literacy, operations, health and safety, and computers; in turn, the plant is a more productive, efficient, and competitive working environment.

Established in 1931, National Silicates—a subsidiary of the PQ Corporation in the United States—is a small chemical company with 93 employees across Canada. Its plants are located in Toronto, Valleyfield, Fort Frances, Whitecourt, Surrey, and Parksville. National Silicates produces and distributes sodium and potassium silicates and magnesium sulphate for over 70 product lines, including, for example, penetrating sealants, and admixtures for cement and concrete. Its silicates and sulphate prevent whitish blooming, or efflorescence, and are added to detergents as cleaning and processing aids, and also act as corrosion inhibitors.

OBJECTIVES

The primary objectives of the CPO program are to upgrade the skill levels of existing plant operators to enable them to be multi-skilled in all areas of plant operations and to develop a workforce with the skills, knowledge, attitudes, and motivation to respond continuously to changes in technology and legislation and thereby enhance the company's competitiveness.

TARGET GROUPS

The program is targeted at current and future machine operators at National Silicates' Toronto plant.

ACTIVITIES

The CPO program is an approved apprenticeship program recognized by the Province of Ontario—and it is the first of its kind in Canada. The CPO program was planned and organized by the Etobicoke Liquid Process Adjustment Committee (ELPAC), a consortium of industry, the federal and provincial governments, a local board of education, a community college, management and labour representatives, and a hired chairperson. In an initial training needs survey of all hourly employees conducted by ELPAC:

- 87 per cent of respondents said they would participate in training if its purpose was to upgrade their skills;
- 68 per cent indicated that improving their math and literacy skills would help them prepare for future training; and
- 83 per cent of respondents were interested in an apprenticeship program.

Not surprisingly, the CPO workplace literacy program developed by ELPAC and implemented at National Silicates addresses each of these issues. The needs of employees have been matched with those of the chemical companies, and an effective and valued learning program has emerged.

The CPO program consists of at least 6,000 hours of theoretical and practical training and includes:

- 90 interactive CD-ROM training modules (200–800 hours)—offering employees a flexible, round-the-clock, self-paced, interactive, private, and non-threatening learning environment
- Hands-on training in environment, health and safety, and responsible care procedures (600 hours)
- Video training modules (200 hours)
- Process unit-specific training in metso anhydrous (dry mix) operations, dissolver operations, furnace operations, utilities operations, maintenance, and laboratory and blending operations (5,200 hours)
- Testing and certification. These are a rigorous and regulated part of the CPO program. Upon completion of the CPO program requirements, employees take an hour-and-a-half written theoretical test designed by the company—consisting of 60 multiple-choice questions. As well, a six- to eight-hour, hands-on, in-house, practical test is taken, where employees are asked to demonstrate their competence in each of the company's functional areas of operation.

Prior to taking the CPO program, all National Silicates employees are required to take basic numeracy and language skills training through the Toronto District School Board as part of the company's workplace skills upgrading program. Upon completion and graduation from this basic skills training, employees are able to begin their three-year CPO apprenticeship program. Individuals who require additional numeracy or language skills training are encouraged and supported—financially and emotionally—by National Silicates.

RESOURCES

The CPO program requires the use of computer terminals, CD-ROMs, and paid overtime (time off). The number of computer workstations needed depends on the number of employees enrolled in the CPO program. National Silicates has a computer room dedicated to training, which houses one terminal. Employees also

have access to a second terminal, which is located in another control room.

- The library of interactive CD-ROM modules, purchased from NUS (Williams Learning) cost approximately \$30,000.
- The ELPAC committee incurred costs in terms of the time its members invested in the project, and in addition, an outside chair was hired to facilitate the development and implementation of the program. Funds from the federal government's Adjustment Incentive Agreement covered the approximately \$60,000 cost of this.
- Initially, the in-house training was offered during a worker's shift. However, this didn't work out, as employees were often called away from their training to work on a job-related issue. National Silicates therefore decided that it was best to hold all training before or after an employee's shift—even though it would cost the company more to do so.

INNOVATIONS

- The CPO program gives its graduates a sense of achievement as well as a certification that is recognized both within and outside of the company.
- Interestingly, the union set a passing grade of 85 per cent for the modules. Management assumed the responsibility of determining whether or not an employee was competent, as per the written test and testing on the functional areas of the plant.
- The training program targets the specific needs of the company and combines theory with "hands-on" learning.
- The program forged partnerships with government, education, and industry.

BARRIERS

- The costs associated with the development and implementation of the CPO program are fairly high. However, National Silicates regards its investment in its people as an investment in the company.
- Time is a barrier to training. Employees often find it difficult to commit to the 6,000 hours of training. As well, the day-to-day pressures of work and life outside of work often limit the amount of time that the company and employees can devote to the CPO program.

SOLUTIONS/KEYS TO SUCCESS

- The curriculum is flexible and current and can be adapted to meet the industry's changing technologies, legislation, and processes.
- The CPO program is self-paced, flexible, mobile, and just-in-time.
- National Silicates and ELPAC created and developed a recognized certification process (apprenticeship) for liquid chemical process operators.
- Company leaders, as well as the union and the company employees, all buy in to the program. Everyone recognizes the benefits, value, and rewards that derive from the workplace literacy training.

OUTCOMES

- Employees have increased their skills in basic numeracy, literacy, operations, health and safety, and computers.
- Employees are "multi-skilled" and can function in all areas of plant operations.
- Employees have a "learn for life" attitude—they are empowered to do their best, learn continuously, and make operational decisions independently.
- The skills that employees gain in the CPO program are transferable and can be used in other jobs within the chemical industry—giving employees an opportunity for advancement within the process operator field or within the broader chemical industry.
- Employees are able to make more decisions independently—allowing for greater productivity.
- An improved work environment results—a happy and productive worker makes for a productive and efficient company.

IMPACTS AND BENEFITS

- National Silicates—and other companies that use the CPO program—has a group of highly motivated, multi-skilled, certified chemical process operators who are productive, innovative, and dependable.
- Employees who graduate from the CPO program reap higher wages (approximately \$1.25 per hour more) and have greater employment opportunities because of their transferable skills.

- The company pays less in overtime costs—a saving to the company—as the program graduates can safely and efficiently solve problems that arise within the plant. In the past, individuals who were skilled in the use of only one piece of equipment might need to call in a person skilled in the use of another machine to solve problems.
- At the plant, there have been improvements in efficiency, productivity, safety, and environment.

USE AS A MODEL

Other companies have noticed the successes and benefits that National Silicates has reaped from the CPO program. Because the training program is “recognized” by the Province of Ontario and the chemical industry in general, other companies like Dofasco, Cameco, Huntsman, ICI/CIL, Cytec, and Nestlé have contacted National Silicates for information about the CPO program. As well:

- The Ontario Chemical Industry Council and Lambton College in Sarnia, Ontario, use the CPO program as a model and are “carrying the torch”

for the workplace literacy initiative. Currently, there are about 90 employees from companies other than National Silicates registered in Lambton College’s CPO three-year co-operative program.

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National Silicates
by *Douglas Watt*

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