## **College Opens Doors for Women Welders**

Curriculum revisions made by Portland Community College's welding technology department seek to attract more students especially women — to welding occupations

## **BY BOB IRVING**

The welding community in and around Portland, Oreg., is tapping a new source of skilled welders: welltrained women who have graduated from the Welding Technology Department of Portland Community College (PCC).

Bob Weisend, general manager, Madden Fabrication, Inc., Portland, has hired many women welders trained at PCC. Those he has hired have high ability, he said, and demonstrate the welding skills and dexterity suited to his company's line of work in surfacing. Weisend describes his company as a diversified fabricator of structural steel. Welding processes employed at the company include shielded metal arc, gas metal arc, gas tungsten arc, and automatic submerged arc welding.

Valve gates of type 316 stainless steel are surfaced at Madden Fabrication with a proprietary alloy using gas tungsten arc (GTAW) welding with filler metal. He noted a great deal of the company's operations are governed by the AWS D1.1, Structural Welding Code — Steel. The women welders involved in this type of surfacing work at his company are certified to the ASME Section IX code.

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(From left to right) Instructor Connie Christopher (wearing light overalls) shows student Nellie Long how to interpret a blueprint; the proper way to measure a fillet weld; and the correct way to achieve a neutral flame with a cutting torch.

## Curriculum Revisions in Response to Changing Workplace Needs

Like many companies, Madden Fabrication has been moving slowly in the direction of higher technology in its welding operations. Weisend noted PCC is doing the same with regard to its welding education.

During the fall term of 2000, five faculty members from PCC, led by welding instructor Connie Christopher, visited 52 companies in the Portland area to conduct in-depth interviews. Much of the information Christopher and the five other PCC faculty members obtained was used to revise existing curriculum and develop new courses.

So far, seven new courses have been added to the welding technology curriculum, including two courses in nondestructive testing, two courses in codes and standards, and one on pulsed GMAW. A three-credit course in automatic submerged arc welding is under consideration. In addition, a onecredit course in plasma arc cutting and gouging is in the planning stage.

But more is yet to come. The Welding Technology Department of Portland Community College is now in its second year of a three-year, \$585,000 grant from the National Science Foundation. The purpose of the grant is to prepare graduates to enter a high-performance workplace. The emphasis is in strengthening the science part of the program by integrating higher level science, math, and computer principles into the curriculum.

The Welding Technology program at PCC leads either to an Associate of Applied Science degree (99 credits), a

two-year certificate (a minimum of 81 credits), or a one-year certificate (at least 44 credits).

## Raising Awareness of Career Opportunities for Women

Christopher herself entered the welding field, almost by accident, in 1973, at the Electric Boat Division of General Dynamics Corp. in Groton, Conn. She initially applied for a clerical position, but was told there were no openings. Instead, Electric Boat offered her the following deal: if she went to school for welder training and successfully passed the required tests, she would be hired by the company as a welder. Christopher did pass and, after further training at the shipyard, eventually became a First Class Journeyman Welder/Instructor at Electric Boat.

During the six years she worked for Electric Boat, Christopher progressed from depositing shielded metal arc welds on HY80 steel using AWS E10018 electrodes to operating GMAW-P equipment on submarine hull sections. "When I first worked at Electric Boat, there were only three women welders. By the time I left, many more women welders had joined the work force."

Christopher left Electric Boat in 1979 and moved to Portland. She worked as a welder for several companies in the area, including the Union Pacific Railroad, before joining the welding faculty at PCC. About ten years ago, Christopher noticed more women entering the program and many more taking individual courses even though they were students in other programs. Welding sculpture, for example, was then, and still is, a popular course among art students that is accepted for credit in the art program.

To attract more women to PCC's expanded welding technology department, Christopher spearheaded the "Ladies of the Arc" project to increase awareness and publicize the many career opportunities available for women in welding and related activities. The project "has already started to open doors we never knew were there," said Christopher.

The Ladies of the Arc Committee at PCC recently participated in a program called "Opening Doors to Your Future," done in cooperation with the Washington County Gender Equity Team and the Portland Area Vocational Technical Education Consortium. The program provided an opportunity for girls of middle school age to experience welding firsthand. More than 100 students participated in the program. "The event was a phenomenal success," said Christopher.

As a result, the Ladies of the Arc Committee plans to participate in similar events in the future. Potential projects include development of the following:

•A Ladies of the Arc student club.

•A local AWS Ladies' chapter.

•A Ladies of the Arc Web site and chat room.

•Job search skill workshops specifically for women in non-traditional occupations.

•Preparation of career information packets for middle schools, high schools, and community college career centers describing what career opportunities are available for women in the metal trades.

•Scholarships for women who plan to enter nontraditional occupations.

•A promotional video for Ladies of the  $\ensuremath{\mathsf{Arc}}.\ensuremath{\mathbb{R}}$