

Education and Training in Optics Fabrication: Establishing unique partnerships to address workforce training needs for optics and other high technology manufacturing

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Over the past several years much concern has been voiced about the lack of trained technologists to support high-technology industry and manufacturing in the United States. Attracting and training both new members and upgrading and retraining current members of this area of the workforce has many challenges to address before adequate numbers of well trained individuals will be available to fill the growing demand and help secure our nation's economic industrial edge. Among the concerns are the lack of effective training programs, available funding, career image, and vehicles to educate the public on the availability of positions and excellent rate of compensation. These concerns which effect many areas of industrial manufacturing have been highlighted by government organizations, such as the Department of Labor statistics, and professional journals and publications. In the specific area of optical fabrication, journals such as "Laser Focus: and Photonics Spectra" have dedicated articles and editorials discussing the lack of optical fabrication training resources in the United States. Examples of other vocational areas lacking skilled workers, such as precision machinists, are reflected in articles in other publications such as "Manufacturing Engineering".

The rising concern by both industry and educational institutions has given rise to examining new and innovative approaches to cooperatively solving these problems. In 1994, the American Association of Community Colleges in collaboration with the U.S. Department of Labor, published a study¹ on creative partnerships between community colleges, business, industry and governmental organizations. The premise developed by the research editor was that while partnerships between colleges and private and public sectors have been developed with great benefit for many years, the challenges facing all parties concerned with workforce development going into a new century will require a new magnitude of creativity. Discussions among both industrial and educational audiences have highlighted this growing concern in a way that is bringing about new ways of thinking in joint collaborations which can successfully, and cost effectively, solve these shortages.

Through unique partnering approaches between educational institutions, industry, and national laboratories, new cost-effective workforce training and retraining programs are being developed to maintain this nation's leadership role in high-technology industrial development. Successful new technician training programs currently being pursued through critical links between Lawrence Livermore National Laboratory (LLNL), community colleges, industry, and high schools are meeting both employer and trainee needs. Currently, under memorandums of agreement which provide for the sharing of curriculum, technical expertise, equipment, and public awareness, identified needs for enhanced optician, laser electro-optic technologist, machinist, and rapid transit operator technical training are being addressed.

This session will describe these industry-driven programs, with particular emphasis on the optician training collaborative developed by LLNL, Monroe Community College, and American Precision Manufacturers Association (APOMA) industrial representatives to support the needs of the nation's optics industry, including the National Ignition Facility (NIF). The \$1.2 billion NIF will be the world's largest optical instrument and is currently the U.S.'s largest R&D project. It will require more than 7,000 meter-class precision optics and more than 15,000 small precision optics. The national capacity for large laser optics fabrication must be increased substantially over its current level, and optics fabrication costs reduced by a factor of two to four times to achieve this goal. It is imperative that an enhanced skilled technical workforce pool be available to enable the U.S. optics industry to successfully meet this challenge.

Through collaborative efforts which bring together the strengths of Monroe Community College, LLNL, and APOMA, an enhanced training program focusing on helping meet this demand is successfully moving forward. LLNL and APOMA industries have provided much needed equipment to assist Monroe Community College in enhancing their program with additional hands-on courses which are critical to the rounded education of the students graduating and entering a highly competitive workforce. To date, APOMA has donated equipment valued at over \$800,000 and LLNL \$500,000. Additionally, through an active industrial advisory board, teamed efforts with the college are helping to develop a responsive, well balanced curriculum which provides students

industry identified state-of-the-art skills. The benefit to the students is a more relevant education which, in turn, provides employers well trained entry level employees which means quicker productivity time and lower costs to the employers.

1. Lisa Falcone, *The Critical Link: Community Colleges and the Workforce*, (1994).

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