Industrial applications of lasers in Latin American countries

ICS/UNIDO-sponsored training courses promote high technology transfer in developing countries

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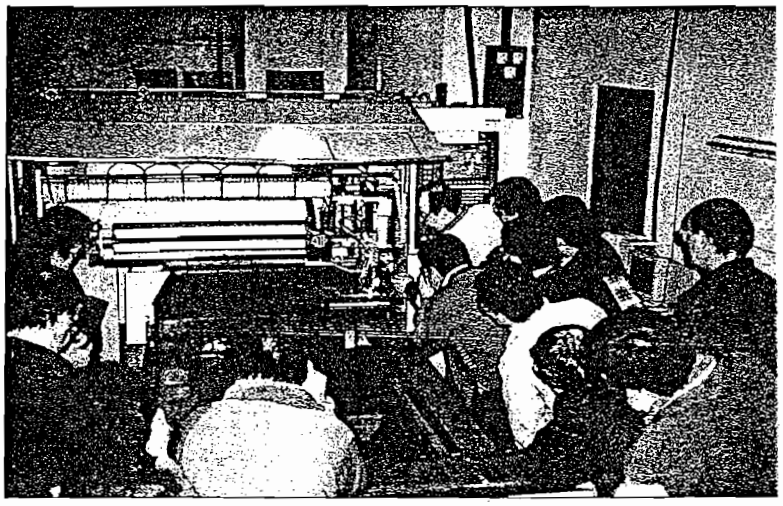
Growing market opportunities have fostered the development of aggressive management strategies and the search for new technologies. Laser technology has attracted, worldwide, a number of people working on transformations in industry, mainly in metallurgy, electronics, and biomedical companies. Today, the metallurgy sector in developing countries is searching for information on new technologies because, in a globalized economy, competition for markets pushes efficiency, better quality, and low production costs. The industrial application of lasers, mainly for cutting, drilling, and soldering is a response to these needs.



Hands-on experience in a commercial job shop is a key part of the ICS training course.

Countries with economies in transition still lag behind in the utilization of high technologies into some of their products and processes. Another characteristic of developing countries is the lack of interaction between their universities and research institutes with industry. University professors in these countries sometimes act as an impermeable layer responding to the technical demands of the local private sector. On the other hand, local industrialists in general do not trust the application of indigenous science even though its level is sometimes as elevated as the science that is produced in the so-called central economies.

Taking account of these facts, a program of training courses designed by ICS/UNIDO to teach applications of industrial lasers focused on the local industrialist, taught by lecturers from local universities and R&D institutes, turned out to be a successful experience. Training courses in Latin American countries, over a period of one year, showed that there is a demand for these high technologies and excellent business opportunities in this area.

A group of experts on industrial laser applications composed of a mix of laser specialists and representatives of laser industries from developing and developed countries met in Trieste, Italy, on October 1996, coordinated by ICS. This group discussed regional necessities, identified local resources, and devised a program directed to industrialists and managers of local metal/mechanical industries. As a result, training courses on industrial laser applications in the metal mechanical industries were carried out in Brazil (Sao Paulo - May 1997), Peru (Lima - October 1997), and Argentina (Buenos Aires - June 1998).

Latin America is a continuously interesting region for investment because of the economic building blocks already in formation: NAFTA (Canada, Mexico and U.S.A.) is a reality. Mercosur (Argentina, Brazil, Paraguay and Uruguay) is a fantastic promise. El Pacto Andino (Bolivia, Colombia, Chile, Peru and Equator) cannot be denied. For example, it is estimated that in 1994 the commercial exchange between the four nations of Mercosur reached US $12 billion. The potential for new business is even higher than this, as the sum of the business volume with other nations is about US $100 billion per annum. Laser applications in countries such as Brazil and Argentina are limited by some factors: high initial equipment investment, geographical distance when maintenance is needed, lack of a "cultural approach" to new technologies and inefficient communication between university specialists and the private sector.

These training courses provided some basic knowledge of laser principles, technical information, and some job-shop training that allowed strong interaction and contact between local university people and local industries. These training courses also acted as a high tech "show room" because laser producers were always present with videos, catalogs, and material from their own companies. They also gave lectures and distributed pertinent information sometimes aided by equipment demonstrations. These activities facilitated the exchange of information and the internalization of the concept that lasers are tools that do both old and new things.

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The courses attracted considerable attention and were highly welcomed by the host countries and by the participants from other countries in the region. The audience was composed mostly of engineers, technicians, managers, and industrialists who came from the metal/mechanical industries. The audience also included local and regional university people (mostly physicists and engineering students). An important factor was that these courses showed capability to raise funds besides the "in kind" contributions. On average the UNIDO contribution was around 60% of the course total cost.

In the three cases, there were many positive results, especially considering that some of the laser technologies have been around for more than 20 years in developed countries. These technologies were not always known by most of the participants of the countries that sent representatives.

Evaluation of these courses gave ratings of "very good" and "excellent" concerning the program, lecturers, and organization. This fact alone is a clear indication that these ICS activities fill part of a repressed demand for this technical knowledge in these developing countries.

The participants very much appreciated the laboratory demonstrations, visits to local industries, visits to jobshops, and the participation of the laser supplier companies in a "show room" type presentation.

The general conclusion is that it is possible to transfer high technology and it should be fostered in those countries that have a minimal industrial basis and infrastructure and, above all, the technical capacity to absorb it. Otherwise these activities should be structured as an awareness-building activity and, consequently, the format of a training course should have a totally different approach. The role played by ICS/UNIDO was demonstrated as being an important one because countries with developing economies have a high repressed demand for this kind of knowledge. Technology transfer plays a tremendous role for the implementation of value into their products and services enabling them to be competitive in a growing economy.

These courses also showed that it is possible to identify in regional research centers and universities resource people willing to transfer local or foreign laser technology to local industries.

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