

Developing world packs industrial laser courses

By Spero Morato and Milton Lima

Countries with transition economies lag in applying advanced technologies to some of their processes and products. Their needs are being proven again and again by packed two-week introductory courses into laser processing technologies run by the United Nations.

Laser applications in developing countries are limited by capital investment in equipment, obtaining maintenance from a far-away manufacturer, a lack of knowledge of the newest technologies and inefficient communication between universities and the pri-

ivate sector. More than 300 delegates went to the first three courses, which were intended for 200.

We were asked to set up the courses a couple of years ago by the International Center for Science and Technology and United Nations Industrial Development Organization (ICS/UNIDO) in Trieste, Italy. There have been two courses in Brazil, one each in Argentina, Peru, Egypt and Tunisia. The next is planned for Mexico early this year.

Interest in the courses demonstrates the potential of markets for high-power lasers in both Latin America and North Africa.

Already there are a number of economic blocks in the Americas: Nafta (Canada, Mexico and the US), Mercosur (Argentina, Brazil, Paraguay and Uruguay) and El Pacto Andino (Bolivia, Colombia, Chile, Peru and Equador).

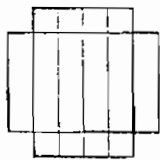
Trade connections

For example, trade between the Mercosur nations reached an estimated USD 12bn in 1994. The potential for new business is even greater, as Mercosur's trade with other nations is in the order of USD 100bn a year. Similarly, Tunisia, a politically stable country with important European trad-

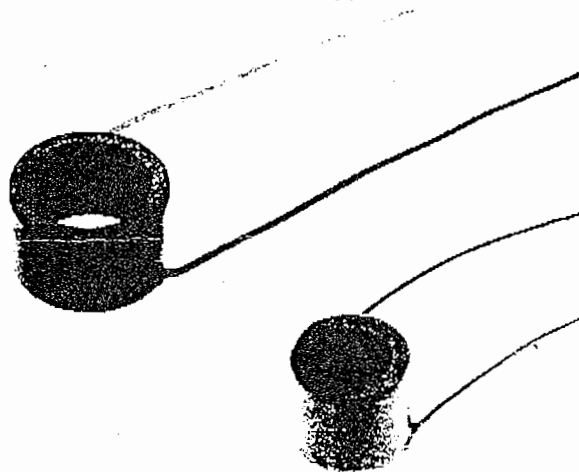
ing partners, such as France and The Netherlands, can be regarded as a Mediterranean gate to Africa.

Companies in these growing markets are fostering aggressive management strategies as well as searches for new technologies. ICS/UNIDO's first three pilot courses on the basic uses of lasers in small and medium-sized enterprises (SMEs) attracted 305 people - mostly physicists, engineers, technicians and managers from different sectors, but especially from metallurgy, electronics and biomedical firms. Doctors and dentists came to specific lectures on biomedical laser applications.

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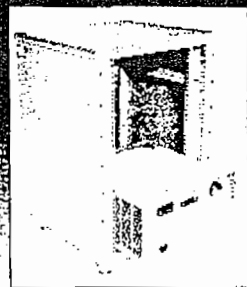
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The courses provided basic knowledge of laser principles and technical information, and job-shop training to encourage interaction and contact between local university people and industries.

The three events had different characteristics, approaches and delegates. São Paulo, Brazil, was directed mostly at SMEs and concentrated on industrial applications. In Lima, Peru, the course was for technicians, industrialists and SMEs. Tunis was aimed at a broader audience, including those in medicine, industry, dentistry and the environment, plus university students and professors.

Often a course created the ambience of a "high-tech" showroom, because laser producers were always present with videos, catalogues and company material while giving lectures and demonstrating equipment. These media facilitated the exchange of information and the internalization of the concept that lasers are tools that do both old and new things.

A total of 193 people registered for the first three courses: 79 for São Paulo, 74 for Lima, and 40 for Tunis. The cost was USD 100 500 (about USD 520 per capita).

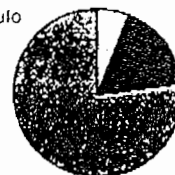
In fact, more people participated than the total numbers registered. We counted the audiences in the best-attended lectures and estimated a maximum of 120 people in São Paulo, 105 in Lima and 80 in Tunis; 305 people exposed to laser concepts, thus bringing down the cost per head further.

The number of people who answered the evaluation questionnaires was 49 in São Paulo, 74 in Lima and 37 in Tunis. These statistics revealed what activities most participants approved of.

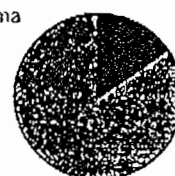
Questions about the programme, lecturers and organization always produced ratings of "very good" and "excellent" above 50%. This clearly indicated that the ICS/UNIDO's activities meet part of a repressed demand for such technical knowledge in developing countries.

Participants particularly appreciated laboratory demonstrations, visits to local industries, the job-shops, and the laser production companies participating with their "showrooms". Simultaneous technology management modules did

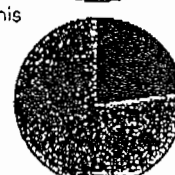
Sao Paulo



Lima



Tunis



□ maybe
■ no
■ yes

Would delegates recommend the courses?

not receive such a high rating, probably because participants are motivated by their lack of technical knowledge rather than a need for management concepts.

Laser companies such as Mazak Sulamericana, Prima Industria, Trumpf, Cilas and Lasag have taken part in some of these courses. Companies, however, were not well rated by participants owing to their poor experience in lecturing to these kinds of audience and the pressure that they are under to advertise their own products. In Tunis and São Paulo, participants said that the course was too long.

From our experience, the transfer of advanced technology to countries that have a minimal industrial base, infrastructure and, above all, the technical capacity to absorb it is an exercise in fostering. In other cases a training course should have a totally different approach so as to stimulate and build awareness. □

Further information

To find out about running or contributing to these courses, contact Francesco Pizzio, managing director of ICS/UNIDO, through "http://www.ics.trieste.it/high-tech" under Laser applications and optical technologies.
Prof. Spero Morato has now returned to the Applied Optics Division, Instituto de Pesquisas Energéticas e Nucleares, Brazil. Milton Lima recently moved to École Polytechnique Fédérale de Lausanne.