Training activities through technical co-operation

Responding to the needs of Member States

by David Kay

Training provided through the Agency's technical co-operation programme has played a crucial role in advancing the peaceful applications of atomic energy. Various means, including fellowships, scientific visits, on-the-job training, and training courses, are used to assist in the accelerated transfer of technology through the development of national scientific manpower. Between 1980 and 1987, fellowships, scientific visits, regional and interregional training courses have accounted for almost 30% of the technical assistance delivered by the Agency and benefited approximately 10 000 scientific personnel from developing countries.

Overview of activities

The four major means used in the technical co-operation (TC) programme to meet the training needs of Member States are:

- ***Fellowships and scientific visits.*** The Agency provides significant training opportunities through its fellowship programme. Such training takes a variety of forms, including attendance at academic institutions, participation in research groups, on-the-job training in a specific industry, short visits to research facilities, or combinations of these. An academic degree, however, cannot be the primary objective of a fellowship. Since 1958, the Agency has awarded more than 10 000 fellowships for approximately 100 000 man-months of training to scientists from more than 100 Member States. By the end of 1987, the awards under this programme totalled nearly US $70 million.
- ***Interregional training courses.*** An important mechanism used by the Agency to meet the training needs of its Member States are interregional training courses. These courses are open to candidates from all regions, are generally targeted at the advanced, specialized level, and make available to participants from developing countries skills and techniques that are not easily obtainable from available academic training. The course is tailored to the specific requirements of developing countries and to couple practical experience with academic training. In recent years, the Agency has offered between 20 and 27 such interregional courses annually with approximately 500 participants. Roughly half of the courses and 60% of the trainees have been in the nuclear power and safety area, followed by courses in nuclear applications in agriculture, medicine, and industry. The distribution by geographical region of trainees in the interregional courses during 1980–1986 was as follows: Middle East and Europe — 31.1%; Asia and the Pacific — 27.2%; Latin America — 22.8%; and Africa — 18.9%.
- ***Regional training courses.*** Regional training courses have grown in considerable importance in recent years primarily because regional co-operative arrangements such as those in Asia and Latin America have assumed a more important role in the technical co-operation programme. Regional courses offer many advantages including greater homogenity among the participants. Training is provided in an environment similar to the one in which the participants will actually work, and it is easier to match regional courses to ongoing technical assistance projects, thereby ensuring effective post-course support for trainees.

  The number of regional courses have grown from 4 in 1980, to 10 in 1983, 47 in 1986, and 59 in 1987. In the 1980–1986 period, the number of participants in such regional courses by region has been as follows: Asia and the Pacific — 486; Latin America — 401; and Africa — 58.
- ***National training courses.*** National training programmes assisted by the Agency have become important in the last 5 years in those advanced developing countries that already have a solid core of trained professionals. The Agency provides lecturers and limited amounts of training equipment. National courses aimed at introducing broadly a particular technique (e.g. isotope techniques in soil and plant research) or at addressing pressing requirements (e.g. quality assurance in a nuclear power programme) have proven to be of significant value. Such national courses are proving to be a cost-effective means of meeting national manpower requirements where large numbers of trained personnel are required. They can be tailored to the specific requirements of the Member State and conducted in the environment where the techniques will be used, and more expensive training abroad can be reserved for more advanced subjects and recent scientific develop-

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ments. An added advantage is that these national efforts also contribute to the development of an indigenous national training capability that is subsequently able to address other fields where training is required. To this end they make extensive use of available national and regional expertise.

Major trends and developments

The fastest growing components of the Agency's training programme have been regional and national courses. In Asia alone, the Agency will support 23 regional courses in 1988; while in Latin America, 26 regional courses are planned for 1988. In Africa, where regional activities have advanced the least, there will be four courses in 1988 as compared to one in 1986. By 1990, it is estimated that regional courses will number about 90, with at least 10% of these being held in Africa.

The dynamic growth of regional co-operation in Asia and Latin America would seem to ensure that this aspect of our training activities will continue to expand. A similar level of regional training opportunities has not yet occurred in Africa and the Middle East because to-date there are no regional co-operative arrangements in these two areas. Regional courses largely develop out of initiatives within the concerned region. Indeed, this is one of their greatest advantages as it ensures that they are responding to actual needs of the countries involved; hence, such training is vitally dependent upon the general level of regional co-operation.

Until recently, the Agency did not systematically collect data on national training courses nor systematically organize its support for such courses. However, recent experience suggests that the demand for such courses is rapidly growing. For example, a number of national courses have served effectively where large numbers of people needed to be trained (e.g. an Egyptian course on intracavitary radiation cancer therapy) or where training needed to be provided for technicians who would not normally be eligible for foreign training (e.g. courses in nuclear instrumentation in Viet Nam, Ghana, and Kenya). Estimates show that national courses will continue to increase in number and will probably account in 1990 for 5 to 6 times as much training as that provided by interregional courses and fellowships combined. It is anticipated that Agency assistance to such courses will have strengthened national training capabilities to such an extent that a large number of national courses will be given without Agency assistance. In Latin America this is already true in the non-destructive testing field.

Regional and national courses are making wide use of a "train-the-trainers" approach. This method is directed toward participants who already have technical qualifications and some professional experience. It aims to improve teaching skills more than add to technical qualifications to enable participants to pass their skills on to others in subsequent local courses. This approach recognizes the obvious advantages of technical training given in the country of the trainee, where both the teachers and trainees are familiar with actual resources, constraints and needs, and attempts to increase the capacity of Member States to provide such training.

Interregional courses have been more sharply focused on advanced techniques and practical applications of nuclear techniques with the objectives of increasing their contribution to the transfer of nuclear-related technologies to developing countries and of providing training not easily obtained by other means. The relative role of interregional courses, however, is very likely to decrease in the next 5 years. Several factors will contribute to this trend. First, it is now recognized that such courses are expensive and that their use must be restricted to high priority, specialized topics where alternative training opportunities are not available. Secondly, it is anticipated that many of the training demands in the nuclear power area previously met through interregional courses can now be met more effectively through other means. Thirdly, regional and national courses will continue to expand rapidly in number, including a significant growth in Africa. This will further reduce the requirements for interregional training.

Responding to needs

The Agency's technical co-operation programme recognizes that its major task is the development of the necessary human resources in developing Member States to support the effective transfer of nuclear technologies. The contributions made to this end by interregional, regional, and national training courses is of critical importance. In recent years, several steps have been taken to ensure that the role of such courses is even further enhanced including:

- Systematic review of new courses to ensure that emphasis is placed on practical exercises and demonstration of the technologies being taught;
- Greater attention to the process by which trainees are selected to ensure that those most in need of such training are provided it;
- Close review in co-operation with developing Member States to assess their actual training requirements to ensure that Agency courses actually meet the real needs of these States;
- Careful integration of the training course programme with the project-based technical co-operation programme of the Agency to maximize the impact of Agency-supplied training; and
- Systematic evaluation follow-up to all training activities.

The training activities of the Agency are continuing to evolve as the needs of its Member States change. The one constant that remains is the commitment to ensure that these programmes are responsive to the needs of its Members.