COUNTRY REPORT FOR THE PHILIPPINES

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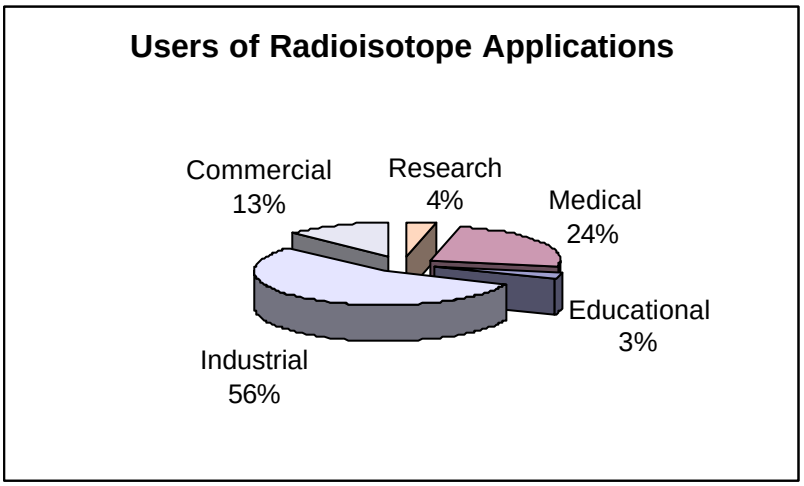
1. Basic Data on Human Resources

In the 2002 HRD workshop, we had presented some basic data on human resources in the nuclear field in the Philippines. These data form the basis for formulating the HRD strategy for the country, with the additional assumption that there is no plan for a nuclear power program in the near future. A projection of the energy needs of the country shows a window for the introduction of nuclear power only in the year 2025 and beyond. The figure below summarizes the breakdown of users of radioisotope applications according to different areas.

Figure 1. Breakdown of Users of Radioisotopes



The distribution shown in the figure would signify that the HRD strategy should address, foremost, the needs of industry, and then the needs of the medical sector.

The Philippines had constructed a nuclear power plant which was unfortunately mothballed in 1986 because of strong anti-nuclear sentiment after the accident at Chernobyl. In preparation for any future nuclear power program, there has to be a comprehensive nuclear science education program for the young generation in order to minimize the negative attitude of the general population against nuclear power. So the HRD strategy in the nuclear field has also to address this need for nuclear science education, especially in the high school level. The young generation now in high school will be decision makers ten to twenty years from now.

Another indicator of the present status of human resources would be the data on academic associations and societies in the nuclear field. This additional data is shown in the following table.

Table 1. Academic Associations and Societies
in the Nuclear Field in the Philippines

Academic Associations & Societies	Year Established	Number of Regular Members	Number of Student Members	Total
Radioisotope Society of the Philippines	1959	350	_	350
Philippine Organization of Medical Physicists (POMP)	1986	40	12	52
Philippine Association for Radiation Protection (PARP)	1962	200	_	200
Philippine Society for Nuclear Medicine (PSNM)	1966	40	_	40
Philippine Society for Non-Destructive Testing (PSNT)	1979	520	_	520
Samahang Pisika ng Pilipinas (Physics Soc. of the Philippines)	1979	200	_	200

The data above shows that the majority of members in associations and societies in the nuclear field come from the industrial sector.

2. The HRD Strategy

2.1 Objective of the HRD Strategy

The HRD strategy will have the objective of ensuring sufficient human resources for the activities outlined below, of ensuring radiation protection and the safe utilization of nuclear techniques, as well as the implementation of nuclear regulations.

Activity Areas:

(a) Radioisotope applications in industry, medicine, research, and other fields including commercial activities
(b) Nuclear science and technology education
(c) Regulatory activities of the national nuclear regulatory body
(d) Human resources in support of the Philippines' research reactor and in support of a future nuclear power program

In (a) there is a need for training users of radioisotopes, and for training radiation safety officers and medical physicists, as required by regulations. There is a need for M.S. and Ph.D. holders in Medical Physics. In (b) there is a need to enhance and upgrade nuclear science and technology education in schools and universities in the secondary (high school) level and in

the tertiary (university or college) level. This means training the teachers, and revising high school and college curricula to include nuclear science subjects. Addressing the needs in activity area (b) will greatly contribute to the social and political climate necessary for a future nuclear power program. In (c) there is a need for enough trained personnel in the regulatory authority to enforce the national regulatory programme – to update the regulations, codes of practice, regulatory guides; to implement the licensing, inspection and enforcement of regulations to assure safety in the uses of radioisotopes; and to maintain preparedness in cases of radiological emergencies. In (d) the need is more long-range in nature, but the more immediate need is in the area of public acceptance and public awareness of nuclear science and technology, as well as graduate degree (M.S. or Ph.D.) holders in Nuclear Engineering.

2.2 Framework of the HRD Strategy

The national human resource development strategy in the nuclear field will include: (1) the conduct of local training initiated by the Philippine Nuclear Research Institute, and which may be conducted in cooperation with national societies in the nuclear field; (2) nuclear science and technology education in schools and universities; (3) role of international cooperation, i.e. training abroad through linkages with relevant institutions and organizations in foreign countries; (4) new techniques for education and training; and (5) preservation of expertise – how to address brain drain and retirement of personnel with expertise in nuclear S&T.

2.2.1 Role of the Philippine Nuclear Research Institute

Several training courses are made available and conducted by the Philippine Nuclear Research Institute (PNRI) locally, and some of these are in cooperation with national societies in the nuclear field. These training courses, as well as other training done outside the country through PNRI's linkages with the International Atomic Energy Agency (IAEA) and other foreign institutions, are able to meet most of the HRD requirements. However, the PNRI is acutely facing a shortage of technical personnel to replace those due for retirement and those lost through brain drain. The problem of preservation of expertise has to be addressed, and this problem exists not only in the nuclear field, but in other fields of science as well. The PNRI also needs to increase the present personnel complement through hiring of new personnel, but it is limited by budget constraints.

2.2.2 Nuclear Science and Technology Education

There is a pressing problem of enhancing nuclear science education in the secondary level as well as in the college or university level. There is a need to coordinate with the appropriate government agencies in charge of secondary and tertiary education to revise the school curricula and introduce more topics on nuclear technology. There is also a need to train and educate a great number of teachers and educators in the basics of radiation and nuclear technology. The agency responsible for secondary or high school education is the Department of Education (DepEd), while that for tertiary education is the Commission on Higher Education (CHED). Successful implementation of the HRD strategy needs the

cooperation of these two agencies, and close coordination among the PNRI, the Department of Science and Technology (DOST), DepEd and CHED.

The infrastructure for the offering of graduate academic programs in nuclear science and technology in the Philippines needs to be developed and improved. The possibility of forming a consortium or cooperation among three or four universities in the offering of masteral or doctoral programs has to be explored.

2.2.3 The Role of International Cooperation

The role of international cooperation is an important component in the HRD strategy in the nuclear field, in order to meet the needs in the Philippines. In addition to training courses, workshops, on-the-job training as well as exchange programs made available through the IAEA and bilateral agreements, academic programmes leading to M.S. or Ph.D. degrees will be needed. The Philippines looks forward to regional cooperation in the area of academic training in the nuclear field.

During the FNCA Ministerial Meeting in October of 2002 held in Seoul, Korea, Dr. Estrella F. Alabastro of the Philippines, and Dr. Helen Garnett of Australia, proposed the sharing of expertise for HRD in the region, making extensive use of IT or online learning (cyber learning).

2.2.4 New Techniques for Education and Training

There is a need to develop training materials and visual aids such as videos, computer-aided instruction, and simple equipment. Distance learning (CD-ROM based), and online learning through the internet will play an important role. The infrastructure for internet-based learning is growing in the Philippines. In addition, the interconnectivity of countries in the region is being enhanced through regional projects and regional cooperation, for example through the activities of the IAEA/RCA.

2.2.5 Preservation of Expertise

The government through the Department of Science and Technology (DOST) has revived the Balik Scientist Program, a program to encourage Filipino scientists working abroad to return to the Philippines through the granting of some incentives. Ways and means to strengthen this program have to be implemented, in order to counteract brain drain. Due to the shortage of experts in the area of nuclear S&T, in the future a mechanism could be provided to grant more incentives to retired scientists who will be hired as consultants.

2.3 Implementation of the HRD Strategy

For effective implementation of the national HRD strategy in the nuclear field, it has been proposed that an interagency body or committee will be formed to oversee and monitor its implementation. The committee will be composed of representatives from the Department of Science and Technology, the Philippine Nuclear Research Institute, the Department of

Education, and the Commission on Higher Education. The time frame for implementation will be ten years.

3.0 Other Activities

Our report in the previous HRD workshops stressed the need to train high school science teachers on the basics of radiation and nuclear science. We are glad to report that on March 3 to 7, 2003, through the Radiation Application Development Association (RADA), a Course on Dissemination of Nuclear Knowledge was successfully conducted in Japan. This training was sponsored by MEXT of Japan, and was one of the series of training courses under the International Seminar on Nuclear Safety 2002. The participants were five teachers/educators from the Philippines, and they will be trainors of other high school teachers in nuclear science.