NUCLEAR KNOWLEDGE AND INFORMATION MANAGEMENT IN CROATIA

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Abstract

Since the IAEA was authorized for exchange of technical and scientific information on peaceful uses of atomic energy, it established INIS in 1970 as an international bibliographic database in nuclear field and in nuclear related areas. All Member States, which are at different levels of technological development, could derive benefits from INIS output products and get the support from the IAEA in systematic knowledge preservation and information exchange. Intention is the transferring of practical experience to the younger generation and the archiving of important information. Croatia is successfully involved in activities in knowledge and information management from 1994 when joined INIS. Accumulation of knowledge including technical information in databases and documents, and knowledge of scientists, engineers, researchers and technicians is base for the use of nuclear technology. Nuclear knowledge and information exchange are important for process of decision-making. Thanks to development and application of new information technologies within INIS information management framework, Members improve the collection, production and dissemination of nuclear knowledge and information.
Keywords: knowledge management; information; IAEA; INIS

INTRODUCTION

The International Atomic Energy Agency (IAEA, Vienna, Austria) as an autonomous intergovernmental organization was authorized for establishing INIS. It was 1970 and INIS was established as an international bibliographic database in the nuclear field and in nuclear related areas. The main idea was exchange of technical and scientific information, published worldwide, on peaceful uses of atomic energy. From 1992, the INIS Database also started to cover the economic and environmental aspects of all non-nuclear energy sources. Today INIS is leading technological and science information system with 129 Members (110 countries and 19 international organizations). Countries at different levels of technological development could derive benefits from the output products. In INIS Membership most of countries are developing countries, in which the major population and economic growth is expected. It has to emphasize the importance of energy as an essential prerequisite for socio-economic development. A critical problem in future could be how to use energy sources according to sustainable development demands. Nuclear energy is probably not the best and only solution but as a major energy source it is very important for the future energy systems. Applications of nuclear and radiation techniques in different areas of science and investigation (medicine, agriculture, radioactive waste management, water resource management…) also contribute to sustainable development [1, 2].

NUCLEAR KNOWLEDGE AND INFORMATION MANAGEMENT IN GENERAL

Much of information and knowledge management involves assuring that people get what they have to know. Of course, there are vast amounts of information and knowledge that few people or maybe any people have to know. But, beyond information and knowledge that we

have to know, there are other things that some people as, for example researchers, designers or managers, perceive that they need to know. They need special kind of information and knowledge in process of their decision making regarding to research studies, design alternatives, investment opportunities and so on. The success of information and knowledge management depends on understanding and supporting the user's need to know including understanding of abilities, limitations and inclinations of humans.

Knowledge and information transfer are very important for process of decision making on all issues connected with the full cycle of using some technologies. In many developing countries, the lack of local planning and assessment capabilities in energy sector is among the principal obstacles to progress since the energy is central to sustainable development. It is even more sensitive question when we use nuclear energy and nuclear technology. The maintenance of nuclear capacity building is impossible without the maintenance of nuclear knowledge. Accumulation of knowledge including technical information in databases and documents, and knowledge of scientists, engineers, researchers and technicians is base for the use of nuclear technology.

The IAEA started to support and to help all Members, particularly those from developing regions, in planning and analysing own capacities. With systematic knowledge preservation and information exchange, the transferring of practical experience to younger generation and the archiving of important information from this segment can be improved. The Agency identified priorities in nuclear knowledge and information management and put efforts in realisation. Integration of existing nuclear database and information in easily accessible form is important. Promotion and coordination of the networking of education and training institutions in nuclear field is next step. Guidance documents on the nuclear knowledge preservation have to be developed and followed by implementation of knowledge preservation projects. Activities in improvement of general knowledge of the benefits of nuclear science and technology and in improvement of nuclear education programmes at universities have to be carried out.

Thanks to development and application of new information technologies within the IAEA's information management framework, the collection, production and dissemination of nuclear information became more flexible and maximal simplified. The role of every Member State in INIS is still significant because decentralized information management is an operational philosophy of INIS and demands full international cooperation. It results in the most effective information management and the most satisfactory services for users of the information [3].

NUCLEAR KNOWLEDGE AND INFORMATION MANAGEMENT IN CROATIA

In 1994 the Republic of Croatia joined INIS. Ministry of Economic Affairs (today Ministry of Economy, Labour and Entrepreneurship) carried out all INIS activities. National INIS Liaison Officer with several co-operators organized Seminar on the organization and implementation of INIS in the Republic of Croatia in 1996 introducing INIS activities worldwide. They also presented INIS input and using output products.

From the beginning of membership in INIS, Croatia established decentralized system of national INIS what resulted with continuous input submitting and significant increase of input records. All requests of INIS Secretariat were satisfied in the same time.

Representative from Croatia participated in INIS Training Seminar organized by IAEA in Vienna, Austria in 2003. Participants concentrated on advance aspects of input preparation for INIS because Seminar was organized for subject specialists, cataloguers and information specialists who were directly concerned with existing INIS operations. It was emphasized the covering of bibliographic description and subject analysis, and the submission of non-conventional literature. Other topics included information retrieval and the utilization of INIS products and related services.

Few months ago Croatia joined group of INIS Members in voluntary input in INIS Database trying to contribute and to improve quality and quantity of the database. It was coordinated voluntary action and Croatian experts gladly participated [4, 5].
The role of the national INIS Centre is very important because it is first in following of defined IAEA's priorities in nuclear knowledge and information management. Since Croatian INIS Centre is very small with only two members not permanently engaged, it was decided to process for input in INIS Database mostly non-conventional literature. Non-conventional literature is not commercially available through the normal distribution channels, such as publishing houses or book and magazine trade and covers all other forms of literature. Croatian INIS Centre decided to cover international congresses, conferences, symposiums and similar meetings organized on the territory of the Republic of Croatia.
Croatia is involved in regional technical cooperation project in Europe supported by IAEA in the field of nuclear techniques for humanitarian demining in effort to increase own capabilities in the application of radioisotopes and radiation processing. Being aware of the worldwide landmine problem, the Agency tried to find appropriate nuclear methods for mine detection. Idea of Coordinated Research Project was to survey the possible methods and to select the most promising one. One device, known as PELAN (Pulsed Elemental Analysis with Neutrons), showed positive results in the laboratory and was selected for field tests under a cooperation project. The device developed in USA, identifies a landmine through the elemental constituents of its explosive what means that it determines the relative concentration of carbon C, oxygen O, nitrogen N and other elements in the anomalies identified by a metal detector, thus determining if explosives are present. PELAN used a pulsed neutron technique in order to identify explosives. As Croatia is country infested with landmines (present estimate about 600000 landmines), demining is important and all efforts have to be intensified. Croatian experts and Croatian government demining organization (Croatian Mine Action Centre, CROMAC) have contract with Agency for field-testing in order to evaluate PELAN performance and capability in near to realistic condition. Two test sites have been established and tests showed that the device is capable of identifying antipersonnel and antitank mines. In the same time research groups in the Netherlands and the United Kingdom contracted by IAEA, worked on optimisation and improvement of sensitivity of this device. During IAEA expert meeting on humanitarian demining in Zagreb, 2004, participants concluded that a test with improved version of PELAN is desirable. This project was carried by support and supervision of IAEA experts and in full international cooperation of scientists.[6, 7]
Croatian involvement in improving of nuclear knowledge and information exchange can be seen in acting of several societies and associations in field of nuclear science and technology, and related areas. These societies and associations are usually organizers of international meetings of scientists, experts and researchers in the field of science and technology interested for the INIS subject scope.
Croatian Radiation Protection Association (CRPA) is a public organization founded with the purpose of promoting and developing scientific, educational and cultural activities in the field of radiation protection and related fields of science. As independent association it was incorporated into International Radiation Protection Association (IRPA) in 1992.
The aim of the Croatian Nuclear Society, founded as scientific expert society, is to improve science and procedures by the peaceful use of nuclear sciences, technologies, and the appropriate security, as well as to introduce the public with the need and specialities of using nuclear technology.
Croatian Young Generation Network (YGN) as a part of Croatian Nuclear Society was founded in 1999 with goals of attracting young people, education and training of the young

experts, knowledge and experience transition between the generations, international contacts and engagement in the international projects, encouraging young experts to join conferences, workshops and seminars, students involvement in the YGN activities and popularisation of the nuclear studies among the students. YGN made big efforts in improvement of nuclear knowledge and information management through its activities. It developed and distributed an educative brochure in the form of a comic with which the members of this society tried to explain some of the basic facts about radiation.

The Croatian Society of Nuclear Medicine and the Croatian Energy Association work with similar goals as previous societies: improvement of the general knowledge in society of the benefits of nuclear science and technology and their applications in related fields; promotion of all scientific and professional activities by organization and participation on international meetings and conferences; popularisation of nuclear science, its results and applications through organization of popular lectures, editing of publications and participation in manifestations of broader social importance.

Last year the Government of the Republic of Croatia and the Government of the Republic of Slovenia signed Agreement on the regulation of the status and other legal relationships, connected with investments in the Nuclear Power Plant Krsko (Nuklearna Elektrarna Krsko, d.o.o.), its exploitation and decommissioning opening possibilities for giving grants to the students and young scientists in the field of nuclear technology from the Nuclear Power Plant Krsko [8]

Undergraduate students in Croatia can choose some of studies at four Croatian universities, which put accent and give very good programme in the field of nuclear science and technology. Also, graduate students can adopt basic and special knowledge from nuclear technology no matter Croatia does not have nuclear power plant inside own borders. In 2002 Croatia got Internet Access to the IAEA INIS Database for Universities of INIS Members free of charge providing users with information 24 hours a day, 7 days a week. It improved the nuclear knowledge and information management in Croatia.

CONCLUSION

Knowledge contains all conclusions and explanations of information set in some field of investigation. So, information is the basis upon which we build knowledge. Today everyone produces, develops or manages information but success of information and knowledge management depends on users and their need to know something. Human abilities and limitations could be understood as boundary conditions. Obvious, knowledge management benefits are great and important and recent trends lead to need of better knowledge and information management, especially in nuclear field. It is challenge how to ensure the availability of qualified people to sustain or even expand the present level of using of nuclear technology. Potential loss of valuable knowledge and non-archived data accumulated over past decades will be damage with long-term consequences but people involved in process of knowledge management are sensitive enough to understand importance of nuclear information and knowledge exchange. Great number of national and international initiatives works in processes of nuclear knowledge preservation. With the same goal, Croatia is strongly involved in all activities in knowledge and information management and shows good results in own efforts.

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