The OECD Nuclear Energy Agency: new directions

by Howard Shapar*

On 1 February this year the OECD Nuclear Energy Agency (NEA) was 25 years old. In the two and a half decades of its existence, the Agency has developed from the fledgling organization of 1958, to the position it holds today as a principal focus for nuclear co-operation among the leading industrial countries.

Although the optimistic projection of the 1950s and 1960s for nuclear power plant deployment have not been realized, nuclear power has nonetheless today become a safe, clean, and affordable way of generating electricity. In the OECD group, where more than two-thirds of the world's nuclear-power generating capacity is located, several countries now produce more than a third of their electricity from nuclear plants. So for the OECD countries, nuclear power has unquestionably become, with coal, a recognized important alternative source of energy to oil.

The intergovernmental bodies that were formed to foster the peaceful applications of nuclear energy deserve at least some of the credit for the advances made by nuclear power to date. Progress in attaining non-proliferation objectives, the development of regional or world-wide information exchange systems, international health protection and safety norms, and special insurance and indemnification regimes for nuclear damage, are amongst the examples of progress that come readily to mind here. The IAEA, which celebrated its 25th Anniversary in 1982, and the NEA can look back with considerable pride on these achievements.

Although they were born almost at the same time and work in closely related fields, the IAEA and the NEA have relatively different areas of operation. In spite of this, the two organizations have effectively co-operated and co-ordinated their activities at several points. Underpinning this co-operation is a formal agreement, signed in September 1960, in which the IAEA and the European Nuclear Energy Agency (the NEA's prodecessor) agreed to act in close co-operation, consulting regularly by reciprocal representation at each other's meetings, by exchanging documents, and by co-operation between the Secretariats.

Joint activities

A few examples of these co-operative efforts may be instructive. The uranium area, where some important producer and consumer countries are not members of NEA, offers a number of instances. The success of the authoritative *Red Book* series, dealing with uranium resources, production and demand, has been a significant achievement. The NEA was joined in this publishing venture by the IAEA in 1967, and eight books have been published jointly since then, with a ninth due this year.

There is also the International Uranium Resources Evaluation Project (IUREP), set up in 1976 under the NEA/IAEA Steering Group on Uranium Resources, which has greatly improved our knowledge of potential world-wide uranium resources.

Close co-operation has always existed between the NEA and the IAEA in the field of radiation protection and public health. As well as the joint sponsorship of meetings, which are designed to disseminate scientific knowledge as widely as possible, the two Agencies have collaborated in more specific activities. Basic radiation safety standards are now being revised jointly with the International Labour Organisation and the World Health Organization.

With respect to nuclear safety and radioactive waste management, the trend has been for the NEA to concentrate on well-defined exercises or research. This work provides data and other information which can be used in the preparation of IAEA safety codes, guides, and other technical documents intended for world-wide distribution.

The benefits of co-operation are particularly evident in certain areas, for example in the sea-disposal of low-level radioactive waste. Here the IAEA established the basic technical definitions and recommendations for the implementation of the London Convention* and the NEA organized, through the Multilateral Consultation and Surveillance Mechanism, a special scheme for regional co-operation to ensure compliance with the IAEA recommendations.

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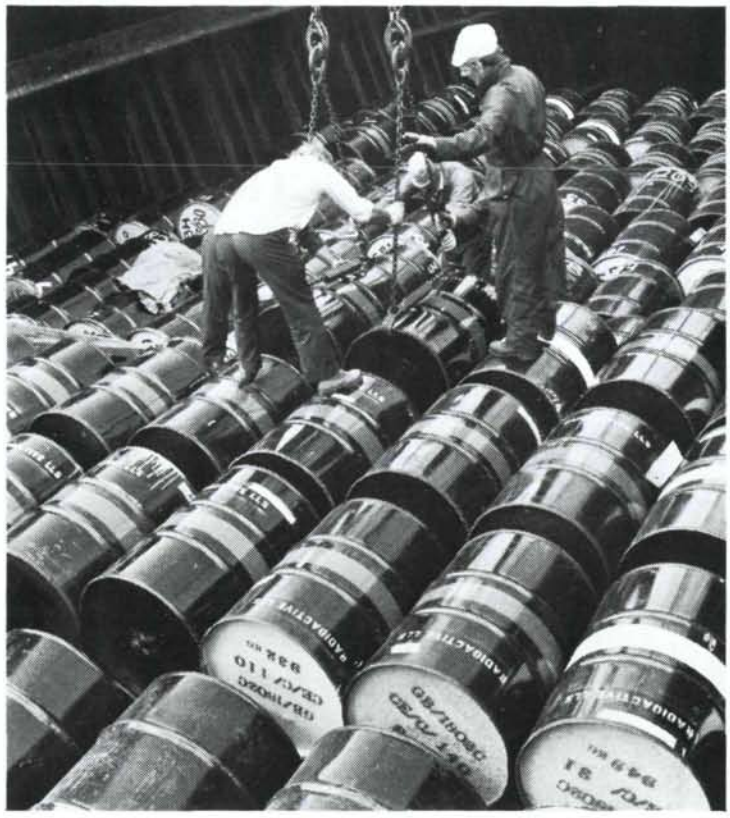
* The London Convention on the "Prevention of marine pollution by dumping of waste and other matter" entered into force in 1975, see *IAEA Bulletin* Vol.24, No.2, page 11 (June 1982).



Packaged radioactive waste from nuclear establishments in the United Kingdom is loaded into the hold of a freighter for disposal at sea. Since 1977, sea disposal operations have been carried out under a formal agreement, whereby participating countries agree to apply all international guidelines and procedures, and to submit their operations to a system of prior notification, consultation, and surveillence, under the supervision of the OECD Nuclear Energy Agency. (Photo UKAEA)

Early co-operation was established between the two Agencies in the areas of nuclear data and computer program exchange. The IAEA Nuclear Data Section and the Neutron Data Compilation Centre were planned and set up simultaneously and arrangements were foreseen, from the start, for symmetrical exchange of bibliographic and numerical data on neutron physics measurements between these two centres and national data centres in the USA and USSR. This exchange network has since been formalized into the group of Nuclear Reactor Data Centres under the co-ordination of the IAEA. Arrangements have also been working smoothly for many years whereby the NEA Data Bank provides computer program services to IAEA member countries.

This brief review would be incomplete without a mention of the International Food Irradiation Project and the Nuclear Third Party Liability Conventions. In the case of the former, eleven years of investigations within the framework of the Karlsruhe Food Irradiation Project jointly sponsored by the NEA, IAEA, and FAO, resulted in 1980 in the recommendation that irradiated food could be accepted for human consumption. With respect to Nuclear Third Party Liability Conventions, the NEA was the first in the field with the Paris Convention signed in 1960. Negotiations within the IAEA promptly followed and in 1963 Nuclear Third Party Liability was put into a broad context with the signing of the Vienna Convention on Civil Liability for Nuclear Damage. Since then the two Agencies have kept in close step. The 1964 protocol amending the Paris Convention brought both systems into complete harmony. The recent revision of the Paris and Brussels Conventions, to cover the adoption of a new monetary unit and to increase the level of indemnity, may in turn influence the terms of the Vienna Convention.

This cursory review of some of our joint activities points clearly to the conclusion that IAEA/NEA co-operation has answered political needs and also proved cost-effective. This is a point worth noting today during a period of economic restraint when the prospects for nuclear power in our member countries continue to be affected by difficult issues.

Against this background, the NEA's task is more than ever to help governments make appropriate decisions about implementation of their nuclear programmes and to help overcome unjustified obstacles to nuclear power plant deployment. The NEA programme is concentrated in four major areas: projections of nuclear power growth and the analysis of supply and demand interactions to assess the need for — and the availability of — the whole range of industrial activities in the nuclear fuel cycle; nuclear safety; the feasibility of radioactive waste-management options; and public acceptance of nuclear power, perhaps the most subtle and intractable issue facing our governments.

Supply and demand analysis

An important NEA activity is the preparation of technical and economic analyses of factors influencing supply and demand in all phases of the fuel cycle. We have placed emphasis in this area on the systematic collection and assessment of data on uranium resources and related research and development, as well as on

projections of nuclear power growth and related needs in uranium and fuel cycle services.

As regards fuel cycle services, recent studies* have shown that there are no technical reasons why the supply of nuclear fuel and fuel cycle services should not meet any realistic level of demand – at least for the rest of this century. The uranium resource-base, levels of enrichment and fuel-fabrication capacity, as well as the capacity of the reactor-manufacturing industry, are more than adequate to meet requirements well into the future. However, the current capacity to supply nuclear fuel cycle services is greatly in excess of immediate demand, except in the area of reprocessing.

In the face of the difficulties now confronting many nuclear programmes, there is a clear need for more sophisticated analyses of cost considerations and of factors influencing the development of nuclear fuel cycle services. Recently a number of new initiatives in the area of supply and demand analysis have been discussed within the NEA. Some of these relate specifically to nuclear development and the fuel cycle and may lead to a gradually expanding programme involving comparative economics and studies relating to the back-end of the fuel cycle.

Nuclear safety

Broadly the nuclear safety programme can be divided into three main areas: safety research and evaluation of operating experience; licensing questions; and special technical issues.

The exchange of information on operating experience is perhaps the most notable case of international co-operation providing short- and long-term benefits for the participants. The NEA Incident Reporting System came into full operation in 1981. It was established to exchange operating experience gained in the thermal nuclear power plants of NEA countries and to facilitate proper feed-back of this experience, not only to benefit nuclear regulatory authorities, utilities, and manufacturers, but also to provide additional guidance for safety research programmes. All OECD countries with nuclear power programmes now take part in this programme.

Another example of safety research worthy of note is the new NEA-sponsored experimental programme to be carried out at the Loss of Fluid Test Facility (LOFT) in Idaho, USA. The three-year programme at the nuclear test facility begins this year with the support of a number of OECD countries.

Waste management

The problems of waste disposal are complex, involving as they do, technical, administrative, financial, and legal considerations. The magnitude of the problems is such that individual countries do not always have the resources to cope, and it is widely agreed that this is one of the most challenging fields for international co-operation.

The main aims of NEA work in this area are to back up national programmes with studies and improvements of the data-base, to contribute to research and development, and to help improve the level of understanding of waste-management issues.

The programme includes such activities as general studies on radioactive waste issues (for example, long-term radiation protection objectives and system performance assessment for high-level waste disposal), and the long-term management of mill-tailings, etc. Now nearing completion is a project which seeks to provide an international definition of a valid radioactive waste-management demonstration programme. Launched this year is the second phase of a research programme to assess the suitability of geologic disposal methods for high-level waste.

International control and surveillance of low-level radioactive waste sea-disposal operations deserves special mention as an example of how international co-operation can help mitigate sensitive political problems.

Public acceptance

Perhaps the most serious threat to the continuing development of nuclear power revolves around the matter of public acceptance. This has been noted and discussed in many national and international forums.

NEA's efforts in this area are largely directed to:
- Making available to its member governments the results of its programmes, as an authoritative source of reference;
- Orienting its programmes towards the solution of technical policy issues in areas of special concern (for example, radioactive waste and nuclear safety); and formulating its findings in such a way that they will be understandable to national policy-makers and decision-formers;
- Systematically analysing public acceptance efforts made in member countries.

In summary the NEA, through its programmes on nuclear power growth analysis, nuclear safety, radioactive waste management and radiation protection, among others, is making an important contribution to improved international understanding and acceptance of nuclear power.

More effective international co-operation

Today there is an increasing awareness in our member countries of the difficulties being faced by nuclear power and a greater realization of the part that international co-operation plays in helping to solve these difficulties. The arguments for more effective international co-operation are very persuasive. But not all the opportunities have been recognized and exploited. This may be a timely reminder as we venture into the future.

* *Nuclear Energy Prospects to 2000* A joint report by the Secretariats of the OECD Nuclear Energy Agency and the International Energy Agency. Published by OECD, Paris (1982).