

## The relevance of the IAEA

by Hans Blix\*

On 29 July this year the IAEA will have been in operation for twenty-five years. It has not, on the whole, been in the limelight of international controversies. Perhaps this is due to the fact that its work has evolved in a practical way without much drama. While this is no cause for regret, every worldwide intergovernmental organization is duty-bound today to examine in what ways its mandate enables it to play a role in confronting the major challenges of our time: food, health, energy, environment, and arms control. To be sure, the IAEA is an organization specialized in nuclear energy, where its main work lies, but it can also make significant contributions in other fields. Let us begin with these.

### Food and agriculture

It is said that the problem of food is not so much the technological one of producing more or better food, but rather the mechanics of distribution, between states and within states. In part this may be true, but the revolution which transformed a vastly populous country like India from a heavily dependent importer of food into a net-exporter was basically a technological achievement: the "green revolution".

In a world whose population is growing from just over four billion today to perhaps more than ten billion by the time it, hopefully, levels off in 2025, we shall need to produce and conserve even larger quantities of food. Our efforts could be dangerously disrupted by crop failure, by plant disease, by distribution breakdowns, by waste, by the distant but even more forbidding risk of climate change. What does the IAEA have to do with this?

In tackling the food problem, we should apply not only "appropriate" technology, we should apply *all* technologies that are safe and economic. Sometimes nuclear techniques offer alternative or supplementary ways of tackling problems in the food field. In a few cases they allow us to tackle problems that would otherwise be intractable.

The spectrum of applications of nuclear techniques is already wide. It includes the potential use of radiation to preserve food, the application of the sterile insect technique to control insect pests (successfully demonstrated against the fruit-fly and now being tried out against the tsetse fly which denies cattle breeding to much of Africa). New strains of plants have been developed with the help of radiation for many years. Radiation-attenuated vaccines are being used to protect the health and improve the quality of livestock. Isotope techniques have shown us better ways of using costly fertilizers for several staple crops. They have offered unique and ingenious tools to map scarce water resources of growing semi-desert regions, and to manage these resources better. While the larger investments in these techniques have usually been made by governments, the IAEA, working with FAO and using the IAEA laboratories for support and development, has often played a pioneering role in collaboration with governments.

### Medicine

What relevance does the IAEA have in the field of health? Reliable standards for radiation protection are evidently needed in all medical uses of radiation. Nuclear techniques have long been a standard part of the armoury of the physician for diagnosing and treating cancer and certain other diseases or malfunctions. Medical research workers have used them to obtain a dynamic picture of physical and chemical processes in the human body, which cannot be obtained by other techniques. Today, most of the IAEA's work in medicine and biology is focused on the use of nuclear techniques and instruments in the developing countries. For instance, in studying the role of essential trace elements (and toxic trace elements) in human nutrition, and in studies in the control of malaria and schistosomiasis (Bilharzia). For many years the IAEA and WHO have also been helping developing countries to ensure accurate measurement of the doses administered to patients during radiotherapy, a necessity for proper treatment of cancer. The contributions that the IAEA can make to world

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health are modest but sometimes nuclear techniques provide unique and indispensable tools to the practising physician and the medical scientist.

### Energy

It is naturally in the field of energy that the IAEA has its main role. Today energy may even be said to be a basic human need! Man's ability to tap ever-increasing amounts of energy from a widening spectrum of sources is basic to our technological civilization. In technically advanced societies we now use eight times as much energy per caput as we did before the industrial revolution and three times as much as a hundred years ago\*. Uncertainty about long-term energy supplies today presents a greater risk of war than perhaps any other single factor at work internationally. Competition for energy sources has contributed to making the Middle East the world's most politically volatile area.

What can nuclear energy do to temper the world's thirst for oil — particularly the thirst of the industrial countries? Already in 1981 nuclear reactors generated as much energy in terms of oil-equivalent as all the oil wells of Saudi Arabia. By 1990 nuclear electricity production will increase fourfold and provide nearly 18% of the world's electricity. Despite the setbacks the industry has suffered in recent years, these projections are reasonably firm, since they are based on plants already under construction. They illustrate vividly how nuclear power is already reducing pressure on fossil fuel supplies. This is of no small significance for reducing competition about these supplies and reducing tension.

With or without the IAEA, nuclear power would have begun to play its part. But the international forum that the IAEA has provided since the early 1960s for the exchange of information about nuclear R&D and about operating experience has certainly helped to accelerate the process. The activities in the Agency have contributed to making nuclear power plants a little more efficient, cheaper, and above all, safer than they might otherwise have been. Without the IAEA's programmes, nuclear power would also have played an even smaller role in the economies of developing countries than it does today.

### Nuclear safety

This brings me to what I believe are the most important contributions the IAEA can make to fulfill its statutory role of promoting the peaceful uses of nuclear energy. They lie in the fields of safety and waste management. It is as the authoritative promulgator of internationally agreed standards, codes, and guides;

as a safety adviser to countries introducing this complex technology; as a clearing house for information about the causes of accidents and ways of avoiding them; as a ready source of emergency assistance; and as a means of verifying nuclear safety internationally through regular missions to countries which request them; that an international organization like the IAEA can make its most relevant contribution to the wider acceptance and use of nuclear energy.

The safe use of nuclear power requires a sophisticated industrial infrastructure and constant vigilance of a high professional order. The public in many countries has become alarmed about the damage that heedless industrial growth and unrestrained use of fossil fuel have done to the human environment and it is concerned about nuclear safety and nuclear waste. The perception that nuclear power is the least environmentally harmful of all the sources of energy commercially available to us today will best be promoted, it is submitted, by a clean record. Fossil fuels will continue to be indispensable for the foreseeable future, but we are seeing ever more evidence of the damage they are inflicting on our natural resources, our forests, our lakes, and on human health itself through the action of acid rain and the deposition of heavy metals. As if this were not enough, there is the menace of irreversible climatic change. None of these consequences is to be feared from nuclear fuels.

We shall need more energy, particularly to meet the needs of the growing and increasingly urbanized population of the poorer countries but also to sustain the quality of life of the most advanced. It is my conviction that nuclear power offers to most of the industrial countries and to a small but growing number of developing countries the most acceptable way out of an environmental dilemma.

### Safeguards and the spread of nuclear weapons

The IAEA deals only with the peaceful uses of nuclear energy. It has been given a limited but vital role in the effort to prevent the spread of nuclear weapons.

The technology of making nuclear weapons is becoming steadily more widely known, thus eroding the technical barriers against horizontal proliferation. The political inhibition — the perception that acquiring nuclear weapons will diminish rather than enhance national security — has always been the main constraint; it is rapidly becoming the only one.

Once the political decision not to "go nuclear" in the military sense has been taken, as it has been by the 114 non-nuclear-weapon states party to the NPT\*, the IAEA and its safeguards become relevant. Here the Agency administers a far-reaching innovation in the relations between nation-states, namely systematic

\* In the 15th century the per caput use of energy in Western Europe is estimated to have been about 120 MJ per day. By 1875 it had risen to 340 MJ in the UK. In the USA today it is about 1000 MJ.

\* Treaty on the Non-Proliferation of Nuclear Weapons (NPT).



Like other international bodies, the IAEA provides an indispensable meeting place for people from all over the world. However, the Agency is a forum not only for the exchange of views between Government representatives, as shown in this photograph of the Board of Governors . . .



on-site inspection. Inspection, moreover, of an advanced and potentially crucial sector of the states' industrial and research and development activities. In some cases, this is done by resident inspectors. The acceptance of inspection is coupled with the acceptance of a duty for facility operators to keep records, to report promptly and regularly, and to submit information to the IAEA about the design of their plants.

The NPT parties and the full parties to the Tlatelolco Treaty have voluntarily accepted this regime over their entire nuclear industry. A number of other countries have also done so in practice without however binding themselves to do so in future, while a few non-nuclear-weapon states have accepted safeguards on some but not on all their nuclear activities. As a result the IAEA estimates that about 98% of the nuclear installations outside the nuclear-weapon states are under IAEA safeguards. This development has contributed significantly to international confidence in the *peaceful* nature of the nuclear activities of most of the nations of this world. It is to be hoped that this activity may serve as a precedent in the area of on-site inspection and that the nuclear-weapon states may, in time, accept institutionalized inspection to verify disarmament measures. So far three of them have placed all or part of their civilian nuclear programmes under safeguards.

The relative novelty of the safeguards operation and the sensitive character of the industry to which the IAEA applies safeguards requires the Agency to handle them with prudence and tact but also, of course, with such thoroughness that the reports based on them carry credibility and create confidence. In this way we may hope that in due time safeguards will be accepted as a commonplace and routine international activity.

#### The international approach

It is only since the Second World War that international bodies have moved towards the centre of the stage with the full glare of often sceptical publicity upon them. They are constantly criticized and equally constantly found to be essential tools and meeting places. They will no doubt become even more essential if we are to have a better ordering of man's affairs on this planet. The IAEA shares with other organizations, within and outwith the UN family, the difficult duty of building confidence in international management and of demonstrating that an international body can go about its work in an effective, economic, and non-bureaucratic manner, despite the powerful and conflicting pressures to which it is constantly and inevitably subject. This is a challenge for its Member States and all the international civil servants who work in the organization.

. . . but also is a vehicle for the transfer of advanced technology to the developing countries, as during this training course on nuclear techniques in agriculture held recently at the Agency's Seibersdorf Laboratory.

