# IAEA/EURATOM AGREEMENT- An Explanation

AGREEMENT BETWEEN THE KINGDOM OF BELGIUM, THE KINGDOM OF DENMARK,
THE FEDERAL REPUBLIC OF GERMANY, IRELAND, THE ITALIAN REPUBLIC,
THE GRAND DUCHY OF LUXEMBOURG, THE KINGDOM OF THE NETHERLANDS,
THE EUROPEAN ATOMIC ENERGY COMMUNITY AND THE
INTERNATIONAL ATOMIC ENERGY AGENCY IN IMPLEMENTATION
OF ARTICLE III, (1) AND (4) OF THE TREATY ON THE
NON-PROLIFERATION OF NUCLEAR WEAPONS

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ACCORD
ENTRE LE ROYAUME DE BELGIQUE, LE ROYAUME DE DANEMARK,
LA REPUBLIQUE FEDERALE D'ALLEMAGNE, L'IRLANDE,
LA REPUBLIQUE ITALIENNE, LE GRAND-DUCHE DE LUXEMBOURG,
LE ROYAUME DES PAYS-BAS,
LA COMMUNAUTE EUROPEENNE DE L'ENERGIE ATOMIQUE
ET L'AGENCE INTERNATIONALE DE L'ENERGIE ATOMIQUE
EN APPLICATION DES PARAGRAPHES 1 ET 4 DE L'ARTICLE III DU TRAITE
SUR LA NON-PROLIFERATION DES ARMES NUCLEAIRES

## IAEA/EURATOM AGREEMENT

**On 5 April 1973, the most important Agreement yet concluded for implementing the safeguards provisions of the NPT was signed in Brussels – the IAEA/EURATOM Agreement. Under this Agreement, Belgium, the Federal Republic of Germany, Italy, Luxembourg, the Netherlands as well as Denmark and Ireland will accept safeguards pursuant to the NPT on all nuclear material in all their peaceful activities.**

Denmark and Ireland had already concluded such agreements with IAEA but have since become members of the Common Market and of EURATOM – its nuclear energy counterpart. When the IAEA/EURATOM Agreement enters into force, the safeguards it foresees will replace those under the earlier Denmark/IAEA and Ireland/IAEA Agreements.

The IAEA/EURATOM Agreement will enter into force after the States concerned have completed their internal approval procedures which, in many cases, will involve parliamentary ratification.

The Agreement was signed by the Permanent Representatives to the European Communities* on behalf of the seven countries concerned, and by Commissioner Ralf Dahrendorf on behalf of EURATOM and Director General Sigvard Eklund on behalf of the IAEA.

It may be remembered that when Belgium, the Federal Republic of Germany, Italy, Luxembourg and the Netherlands signed the NPT in 1969, they indicated that they would ratify it only after a satisfactory agreement with the IAEA had been concluded. Negotiation of the Agreement began in November 1971, and after seven rounds of negotiations a mutually agreeable text was reached in July 1972. In September 1972, the Agreement was approved by the Council of Ministers of the European Communities and, shortly thereafter, by the Board of Governors of the IAEA.

**At the ceremony in Brussels, both Dr. Eklund and Professor Dahrendorf stressed the importance of the Agreement for the success of the NPT. Dr. Eklund stated that it would give the NPT a new momentum and affect the attitude of other industrial countries. It would bring under NPT safeguards more than half the nuclear power plants that now exist in States not having nuclear weapons. Professor Dahrendorf said that the Agreement could not only promote other international agreements that would help to prevent proliferation of nuclear weapons, but also agreements "on the way to effective nuclear disarmament".** Both speakers indicated that the Agreement would begin a period of close co-operation between the Community and the IAEA, and Dr. Eklund expressed the hope that the Governments concerned would take speedy action to bring the Agreement into force.

### THE NATURE OF THE AGREEMENT

Like the other 40 Agreements that the IAEA has negotiated with States under the Non-Proliferation Treaty (which is now in

* EEC (the Common Market), EURATOM and the Coal and Steel Community.

ment of the Kingdom of the Netherlands
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force for 78 countries), the IAEA/EURATOM Agreement is based on a series of 111 standard provisions that the IAEA Board of Governors approved in June 1971 as a basis for negotiations (known in the Secretariat as the "Blue Book"). However, the Agreement takes into account the fact that EURATOM has applied comprehensive safeguards in the countries of the Community for more than a decade and that EURATOM will now undertake, in applying its safeguards, to co-operate with the IAEA to ascertain that no nuclear material is diverted to nuclear weapons or other nuclear explosive devices.

This co-operation is spelt out in detail in a Protocol to the Agreement in which EURATOM and the IAEA undertake a series of obligations that will ensure the effective working of the Agreement.

Broadly speaking, the Agreement foresees an information and reporting system which is very much the same as that in other existing agreements with individual countries. EURATOM will, however, carry out a preliminary checking and analysis of the information to be sent in routine reports to the IAEA. As in the case of all other NPT Agreements, these reports will be sent to IAEA Headquarters every month. IAEA and EURATOM will jointly carry out the examination of the general design of plants to be inspected. This too reflects a procedure which is already in practice under other Agreements.

The procedures that the Protocol foresees for inspections are spelt out in much more detail then in other Agreements, since they take account of the existence of an experienced Inspectorate which EURATOM has built up over many years. IAEA and EURATOM inspections will be closely co-ordinated.

As in the case of all NPT safeguards Agreements, the IAEA/EURATOM Agreement lays down the maximum limits of routine inspection effort (in terms of man-years or man-days of inspection) for

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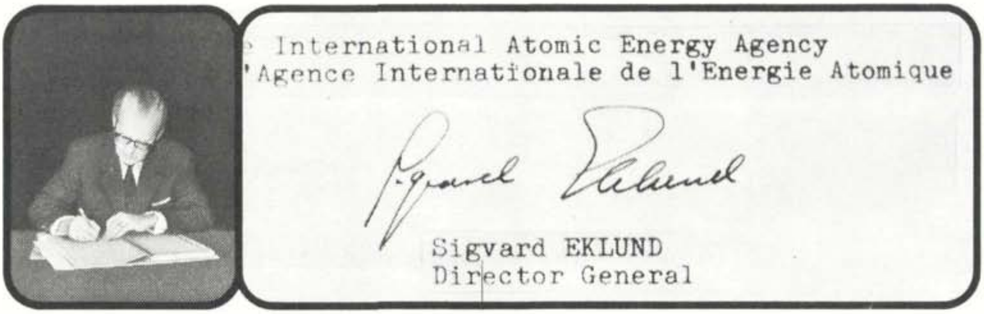
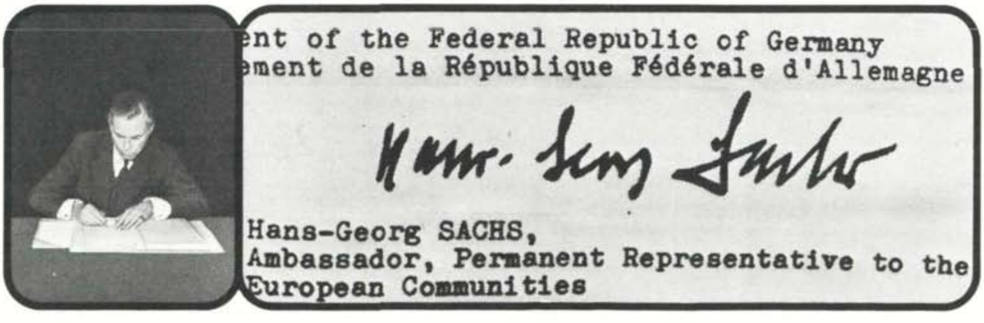


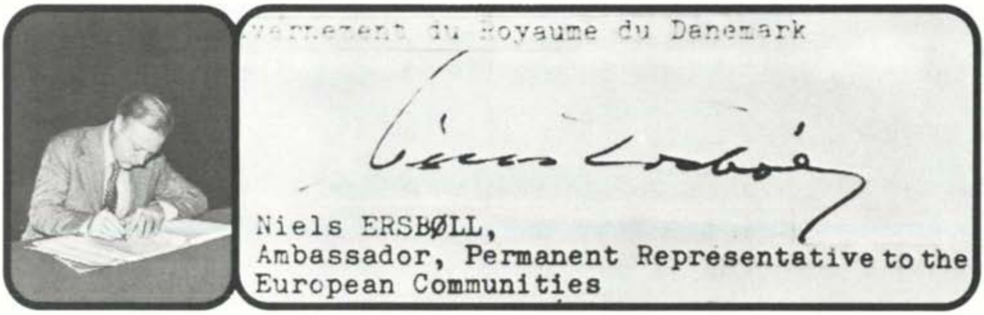

different categories of nuclear plant. Within these limits, the estimated amount of actual inspection effort (i.e. inspection man-days) to be spent at each nuclear plant of the Community, by EURATOM and by IAEA inspectors will be calculated in advance according to agreed rules and methods. These calculations will only remain valid provided that a number of specific undertakings upon which they are based continue to be met by EURATOM.

For each plant, the procedures to be followed for verification (inspection) and scope of the inspections to be carried out will be spelt out in a "facility attachment". This is a confidential document used for all safeguards Agreements to describe in detail the arrangements for safeguarding each plant. This document will also contain the estimates of man-days for both IAEA and EURATOM that result from the calculations already referred to.

The rules and methods for estimating inspection effort for each plant play a crucial role in the Agreement. They derive from certain provisions in the "Blue Book".

Amongst the most important of these provisions are the definition of the objective of NPT safeguards work and the technical conclusion to be reached by the IAEA in such work. This technical conclusion consists of statements by the IAEA indicating how much nuclear material (if any) is unaccounted for in pre-defined parts of the plant (or of the fuel cycle), over pre-defined periods of time. These statements must also indicate how accurate the IAEA judges them to be. Another important provision lays down the criteria to be used by the Agency in determining the routine inspection effort at any plant. These criteria permit a reasonable amount of flexibility in determining this inspection effort. Amongst them is the extent to which the operator of a plant is "functionally independent" of the state system of controls and accounting. In the case of the IAEA/EURATOM Agreement, the significance of this criteria is that it permits, and indeed





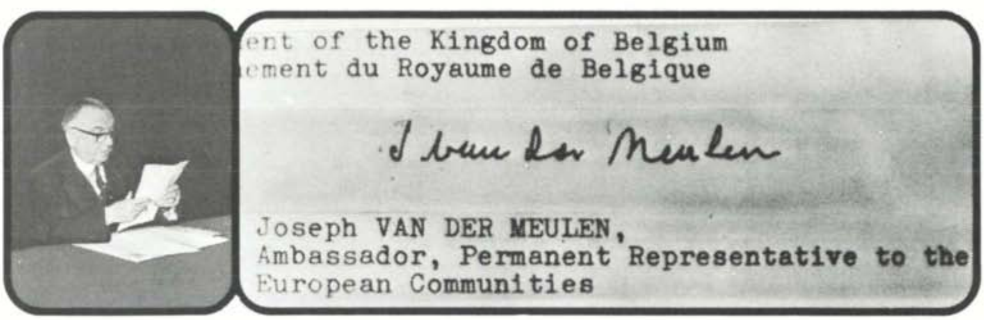

requires, account to be taken of the extent to which the EURATOM Inspectorate is able to provide impartial and independent verification of the operators' own accounting for nuclear material in his plant.

To understand the meaning of all this in practical terms we must look at the way that inspectors work in different kinds of nuclear plants at various stages in the fuel cycle. The logical sequence is from fuel enrichment plant to fuel fabrication plant to reactor to the reprocessing plant, where the spent fuel is chemically separated into its various components and part of the output is returned to the fuel cycle. However, reactors are much more widespread than other kinds of plant and the safeguarding problems they involve are simpler. So we shall begin with reactors.

First of all, however, it must be remembered that in *all* kinds of plants the auditing of the operator's records – to see that the reports he has sent in tally with his books – is, of course, very important. However, there are big differences in the nature of the other inspection work to be done in various kinds of plants.

In those nuclear power plants and in other reactors where the fuel is only changed once a year or even less often, one of the main tasks of an inspector may be to check the integrity of seals which may have been attached to the *reactor vessel* so as to make sure that no unrecorded removal of fuel elements takes place. During the loading and unloading of fuel assemblies there must be surveillance (to see that there are no unrecorded removals or insertions) but this can often be done by automatic camera or other instruments. Each individual fuel assembly may also have a seal attached to it when it leaves the fuel fabrication plant.

The number of fuel elements in the reactors is known, and they form a "population" which can be statistically sampled to check that the fuel assembly seals are intact. This is one example of the technique of statistical sampling which plays a very important part in safeguards operations.



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When we come to plants through which there is a continuous flow of material, however, the problems become more complicated. In all such plants the inspector verifies what goes in at one end and what comes out at the other. He must also check the amount of material held in the plant – the "physical inventory" – from time to time.

In the fuel fabrication plants that turn bulk uranium into individual nuclear fuel elements for the reactors, verification is partly a matter of counting and checking the weight and the composition of incoming *bulk* fuel and of outgoing *individual* fabricated fuel assemblies, and of checking the seals applied to the latter.

Similar checks and verification must be made at the input and output ends of chemical reprocessing plants and of enrichment plants. Material passes through these plants in liquid or gaseous form. These forms make it more difficult to verify the precise composition of the material, and at the same time these forms and the material itself lend themselves to potential diversion much more easily than elsewhere in the fuel cycle.

In all three types of plant – fabrication, reprocessing and enrichment – the operator himself must constantly take samples from the various flows of material in order to know precisely – and to control – what is entering and leaving his plant and what is happening at other crucial points in the plant.

Let us assume that the EURATOM Inspectorate requires the operator to give it a certain number of samples so that EURATOM may verify the operators' own reports. By taking duplicates of a certain proportion of these samples, the IAEA can verify the accuracy of both EURATOM statements and the operators' reports. In this way, the IAEA can achieve the objective of its safeguards work ( and the technical conclusion referred to above) with a reduced amount of inspection effort, since it will be maintaining a continuing

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check on the technical accuracy of both the operators' and EURATOM's sampling techniques and procedures.

Put in another way, the IAEA's "thin" sampling layer, super-imposed on EURATOM's "fatter" sampling layer, can give the degree of assurance sought – provided that IAEA can verify the operator's as well as EURATOM's measurement of samples and provided that *all* samples are taken in a purely random manner.

While today many of the measurements still require physical removal of some of the material, it is expected that to an increasing extent they will be made by using "non-destructive techniques" i.e. by using instruments that make the necessary measurements on the spot and without taking samples.

Some other important provisions of the IAEA/EURATOM Agreement should also be referred to. On the basis of rules and methods mentioned earlier, the IAEA will carry out its routine inspection at the same time as some, but not all, of EURATOM's inspections. To the extent that the IAEA can achieve the purposes of its routine inspections by observing EURATOM's inspection activities, it will do so.

To enable these co-operative arrangements to work effectively EURATOM will give IAEA detailed advance information about its technical inspection plans and there will be a full exchange of inspection information. The two organisations will establish a technical liaison committee to help carry out the Agreement, resolve any questions that may arise and keep estimates of routine inspection effort up to date.

The negotiation of the Agreement itself has been completed but work continues on the technical side. Confidential "facility attachments" have already been drawn up for several nuclear plants of different types and work is proceeding on the attachments for other plants, so that when the Agreement enters into force, its technical implementation can begin as quickly as possible.