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Communication Received from Certain Member States Concerning their Policies Regarding the Management of Plutonium

1. The Director General has received a note verbale, dated 2 September 1998, from the Permanent Mission to the IAEA of Belgium. In keeping with Belgium's commitment under the Guidelines for the Management of Plutonium (contained in INFCIRC/549 of 16 March 1998 and hereinafter referred to as the "Guidelines"), the government of Belgium, in the enclosure of the note verbale of 2 September 1998, in accordance with Anexes B and C of the Guidelines, makes available information on its national holdings of civil unirradiated plutonium and of plutonium contained in spent civil reactor fuel, as of 31 December 1997.

2. In light of the request expressed by Belgium in its note verbale of 1 December 1997 concerning its policies regarding the management of plutonium (INFCIRC/549 of 16 March 1998), the texts of the enclosures of the note verbale of 2 September 1998 are attached for the information of all Member States.

ANNEX B

Annual figures for holdings of civil unirradiated plutonium

Belgium

		As of 31 Dec. 1997. (Previous year's figures in brackets) Rounded to 100kg plutonium
1.	Unirradiated separated plutonium in product stores at reprocessing plants	0 kg (0 kg)
2.	Unirradiated separated plutonium in the course of manufacture or fabrication and plutonium contained in unirradiated semi-fabricated or unfinished products at fuel or other fabricating plants or elsewhere.	2.800 kg (2.600 kg)
3.	Plutonium contained in unirradiated MOX fuel or other fabricated products at reactor sites or elsewhere.	0 kg (100 kg)
4.	Unirradiated separated plutonium held elsewhere.	negligible (negligible)

Note:

(i)	Plutonium included in lines 1-4 above belonging to foreign bodies.	
(ii)	Plutonium in any of the forms in lines 1-4 above held in locations in other countries and therefore not included above	800 kg (not communicated)
(iii)	Plutonium included in lines 1-4 above which is in international shipment prior to its arrival in the recipient State.	0 kg (0 kg)

ANNEX C

Estimated amounts of plutonium contained in spent civil reactor fuel

Belgium

		As of 31 Dec. 1997. (Previous year's figures in brackets) Rounded to 1000kg plutonium
1.	Plutonium contained in spent fuel at civil reactor sites.	14.000 kg (12.000 kg)
2.	Plutonium contained in spent fuel at reprocessing plants.	0 kg (0 kg)
3.	Plutonium contained in spent fuel held elsewhere.	0 kg (0 kg)

National Strategy on Nuclear Energy and Fuel Cycle

General plans for the national management of plutonium holdings

Contents

1. Energy Resources and Policy

Belgium, one of the most densely populated countries in the world, has no domestic energy resources, except a very small amount of hydropower. The country is almost entirely dependent on imports

Since the oil crises of the 1970s, energy policy has been aimed at reducing the dependence on oil, and its use for electricity generation has fallen from over 50% in 1973 to less than 2%. The energy policy guidelines are set by the federal government. They include << maintaining the equilibrium of the energy balance and the security of supply >>, mainly by promoting the efficient use of energy and the diversification of the energy supply and the primary energy resources and by protecting the environment.

2. Electricity Generation and Nuclear Reactors

In accordance with the basic diversification principle, Belgium has set up a civilian nuclear programme since the early days of atomic energy, with a strong initial support from the United States of America in the framework of << Atoms for Peace >>.

The first PWR built in Europe, the 11 MWe prototype reactor BR3, operated from October 1962 until June 1987 at the national nuclear research centre at Mol. Apart from its electricity production, it was used for training and as a test facility for advanced concepts such as MOX-fuel. Belgium held a 50% share in the first French PWR, Chooz A, which operated from April 1967 until October 1991.

There are now 7 nuclear reactors (PWRs) operating in Belgium. They have a total installed net capacity of slightly above 5,7 GWe. The reactors are located at two multi-unit sites: Doel on the Schelde estuary close to Antwerp, and Tihange on the River Meuse between Liège and Namur. In 1996, the seven reactors supplied 41,2 TWh which represented almost 57% of the electricity generated in the country and 17% of its primary energy consumption. Belgium also holds a 25% share in the French plant Chooz B, with two 1 400 PWRs which are now in the commissioning phase.

There is no intention to construct a new nuclear power plant in Belgium in the short term.

3. Nuclear Fuel Cycle

The nuclear fuel cycle services in Belgium are provided by a mix of private and sector companies.

3. 1. Synatom is a company owned by the electric utilities. Through a golden share the federal government has kept its right to veto, if needed, any decision of the company which would not be in line with the national energy policy. Synatorn is responsible for the management of the fuel cycle for the nuclear reactors. This means :

1) fuel procurement, including uranium and enrichment supplies, but excluding fuel fabrication, which is contracted by the nuclear power plant operators themselves;

2) spent fuel management, including interim storage, reprocessing and/or conditioning of spent fuel.

Except from a small domestic production (about 40 tonnes a year) from imported phosphates, as a by-product of the production of phosphoric acid, Synatom secures most of the Belgian uranium supplies through medium and long term contracts in several countries. Occasional purchases are made on the spot market and fissile material from reprocessing is also used.

The conversion and enrichment services are provided abroad, mostly by long-term contracts with suppliers in Europe and North America. Synatom has a 11% stake in the enrichment plant of Eurodif (France).

3.2. FBFC International operates a fuel fabrication plant with a capacity of 400 tons a year. It concentrates on various designs of PWR fuel assemblies. It has also diversified into the production of gadolinia pellets and rods and the assembling of MOX fuel elements. Most of the PWR assemblies are exported.

3.3. Belgonucléaire, a company owned 50:50 by the State and the private electric utilities, operates a MOX fuel fabrication facility, with a capacity of 35 tons a year. The cumulative production of MOX fuel has reached 308 tons at the end of 1996. In this way, more than 17 tons of plutonium have been recycled in LWRs. The Belgonucléaire plant supplies MOX fuel to Doel and Tihange and to nuclear power plants in France, Switzerland, Germany and Japan.

3.4. ONDRAF/NLRAS is in charge of the interim storage and final disposal of conditioned radioactive waste in Belgium, as well as of the transport, treatment and conditioning of radioactive waste for nuclear operators which do not have their own installations. ONDRAF/NIRAS is also legally entrusted with the temporary storage and/or conditioning, as the case may be, of fissile materials which are declared by the operators to be in excess to their operational needs.

4. Back-end of the Nuclear Fuel Cycle, including Plutonium

4.1 *Reprocessing*

In the past, reprocessing of spent fuel and recycling of the recovered materials used to be the only option in Belgium, according to numerous recommendations and decisions of the House of Representatives and the Government.

In conformity with this policy Synatom has concluded and implemented reprocessing contracts abroad. Following contracts have been concluded with the French company Cogéma : in 1976 for a quantity of 140 tones of spent fuel (reprocessing terminated) in 1978 for 530 tonnes (reprocessing from 1991 to 2000), and in 1990 for 225 tonnes (reprocessing between the years 2001 and 2010), with options for 120 tonnes per year from 2001 until 2015 (for this last contract, see further point 5).

4.2. *Uranium and plutonium recycle-Waste management*

Reprocessing will, by the year 2000, lead to the recovery of 485 tons of recyclable uranium and 4,6 tons of recyclable plutonium and the return to Belgium of non-recyclable waste.

The recovered uranium and plutonium are re-used in the Belgian reactors shortly after reprocessing.

For the return of non-recyclable waste ONDRAF/NIRAS is implementing a programme of building the necessary intermediate storage facilities. The part for the vitrified high level waste is ready and the part for other reprocessing waste is in the commissioning phase.

As far as final disposal is concerned, the need for safe and socially acceptable solutions is being recognised at the Belgian as much as the international level. For the low level and short-lived waste the Government has to take a decision on its final destination, based on a report of ONDRAF/NULAS comparing different options. For intermediate, high level and long-lived waste a disposal in stable underground clay formations is foreseen. Belgium is in the forefront of R&D in this field.

5. Current Policy on the back-end of the Fuel Cycle

The positive attitude towards reprocessing and recycling in Belgium has changed since the end of the 1980s. This culminated in 1993 when a parliamentary debate took place about the reprocessing and the use of MOX fuel. The main conclusion, endorsed by the government, was to leave the fuel cycle back-end options open for a period of at least 5 years. During this period:

- conditions have to be established in the near future to allow the development of the strategy of conditioning and direct disposal as an alternative to reprocessing. The priority has to be given to R&D on conditioning and disposal of unreprocessed spent fuel, including in an international framework, without however decreasing the current research programme on disposal of reprocessing waste in deep geological formations. The once-through-cycle option is henceforth placed at the same level of priority as reprocessing;

- elements have to be gathered for a new overall evaluation of the situation. On the basis of these elements a new debate in Parliament will take place. It must allow the Government to decide on the future strategic options for the back-end of the fuel cycle;

- the industry is not permitted to execute the reprocessing contract concluded in 1990, nor to negotiate any new reprocessing contract;

- the use of plutonium recovered from the 1978 reprocessing commitments in the form of MOX fuel in Belgian nuclear power plants shall take place in conformity with the results of the safety analysis. The licences to load MOX fuel in Doel 3 and Tihange 2 have been delivered. The MOX-loading started in 1995;

- the uranium recovered in the framework of the 1978 reprocessing contract is sent to enrichment plants and recycled in nuclear power plants in Belgium;

- interim storage of irradiated fuel has to be ensured. The necessary licences have been delivered for the extension of the spent fuel storage capacity at Doel and Tihange. The extensions have been put into operation. They provide enough storage capacity until several years beyond the year 2000,

- a study has to be undertaken of the safety (concerning public and workers) as well as the technical and economical feasibility of industrial facilities for spent fuel conditioning, packaging and disposal.

6. Controls and Transparency

In order to assure the national and international public opinion and authorities that its nuclear activities are peaceful and undertaken in accordance with the highest level of security, safety and radiological protection, Belgium has implemented a set of very stringent regulations, control and surveillance mechanisms. These measures have ensured outstanding non-proliferation credentials for the country. This is a major achievement for transparency.

Belgium is a party to the Treaty on the Non-Proliferation of Nuclear Weapons and to the treaty establishing the European Atomic Energy Community (Euratom) and accordingly is bound by all nuclear cooperation agreements concluded by the Community. Belgium is a member of the I.A.E.A., has ratified the Convention on the Physical Protection of Nuclear Material, participates in the Zangger Committee and is a member of the Nuclear Suppliers' Group. All its nuclear activities are carried out under full scope Euratom and I.A.E.A safeguards. The application of these safeguards places significant contraints on the industry, particularly on facilities dealing with plutonium fuel. In cases of plutonium handling, safeguards controls are permanent.

A major reorganisation of safety and radiological protection controls is currently under way. In April 1994 a law was passed in order to create a federal Nuclear Control Agency (FNCA), which will group and replace the present safety authorities spread over different ministries. This agency, which is getting in operation, will exercise all control and surveillance activities in facilities using ionising radiation. The FNCA shall also be in charge of assisting the I.A.E.A. and Euratom inspectors during their inspection and verification duties on Belgian territory.

Belgium has ratified the Convention on Nuclear Safety and has signed the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste management.

7. **Highlights on Plutonium**

a) Belgium. has no intent to use plutonium for any explosive purpose. It is strongly committed to non-proliferation.

b) Plutonium recovered from reprocessing of spent fuel is refabricated as MOX fuel as quickly as possible. The policy calls for the immediate recycling of separated plutonium.

c) The licences to load MOX fuel in two commercial nuclear power plants have been delivered, after extensive democratic debates. MOX loading has started in 1995.

d) Belgium has on its territory an operating industrial MOX fuel fabrication facility, with an annual capacity of 35 tons. Experience with MOX fuel manufacturing and utilisation dates back from the early sixties. The cumulative production of the MOX plant was about 308 tons at the end of 1996. It supplies MOX fuel to two Belgian reactors and to nuclear power stations in France, Switzerland, Germany and Japan.

e) As required by its in international commitments, all nuclear material in Belgium are subject to Euratom and I.A.E.A. safeguards. In facilities handling plutonium, safeguards controls are permanent.