

Plutonium Investigation

BELGIUM

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EDITORIAL

Democracy or Pluto's Kingdom?

The presentation was a complete disaster. As everybody who assisted that session of the Economic Affairs Committee at the Belgian Parliament five years ago, when Electrabel and Synatom top managers gave evidence on the plutonium strategy of the industry, will remember. In fact, the speeches of the cream of the Belgian nuclear establishment had been prepared by the Public Relations Departments of the respective companies on the basis of transparencies (not transparency), but, unfortunately, there was no overhead projector to use them. Tough luck, the bosses were lost, they stammered, perspired, were yelled at and stomped out. While this kind of misfortune can happen - and does happen - to anyone of us doing presentations in public, the scene in the Belgian Parliament was highly symbolic of an unhealthy but common phenomenon: the representatives of the nuclear industry are not used to putting their decision making up for public scrutiny. While any other public and private budget line is subject to intense wheeling and dealing to avoid the usual cut, the nuclear industry spends dozens of billions of dollars without ever having to justify much. And certainly even less so in public. Over the last five years the Belgian industry has demonstrated once more its lack of respect of parliamentary decisions. While the December 1993 resolution was based on a democratic process, the industry has not since done its homework. Instead of carrying out the resolution to letter and spirit of the law - and confront the parliament with a well tuned new back-end strategy - the lobby most obviously has and is trying to cut short any attempt to organise a real debate at the House of Representatives. Parliamentarians where are you?

BELGIUM Decisive Parliamentary Debate Upcoming

Belgium is one of the few non-nuclear weapon states to have developed reprocessing and a full-scale plutonium industry. Indeed this small nation has hosted a reprocessing plant and an experimental plutonium fuel fabrication plant since the mid-1960s. A prototype 11 MWe pressurised water reactor in Belgium was the first reactor in Europe to be loaded with MOX (uranium/plutonium) fuel. The MOX fabrication plant P0 at Dessel/Mol, which has been operated by Belgonucléaire since 1973, has provided a significant portion of the MOX fuel which has been used in Europe until the mid-1990s. Most of the MOX is produced for foreign clients. Currently, while the MOX fabrication plant is still operating, there are no further plans to develop the plutonium industry in Belgium. After a parliamentary debate in 1993, the House of Representatives requested in a resolution that the Government implement a morato-

CONTINUED ON PAGE 2

rium on future reprocessing contracts, while at the same time agreeing to MOX use in Belgian pressurised water reactors (PWRs). Another parliamentary debate is scheduled for the end of 1998, to discuss some of the same topics as in 1993 and make a final decision concerning future spent fuel management in the country. However, knowledgeable sources in Belgium suggest that the debate could be delayed, which, of course, would delay any subsequent decision.

There are seven pressurised water reactors operating in Belgium. Three are located at Tihange on the River Meuse and four at Doel on the River Schelde. Belgium is a very densely populated country and the plants have been built very close to cities. The Doel plant is only at 12 km from the second largest city Antwerp (population about 650,000), while the Tihange plant is only 5 km from the smaller city of Huy. In the event of a nuclear accident involving a core meltdown and dispersal of part of the radioactive inventory, these nearby cities would be severely contaminated and the health effects to their population very significant. The use of MOX fuel further increases the potential risks. More than half of the electricity generated in Belgium stems from nuclear power. During 1997, the seven pressurised water reactors (PWRs) generated 45 TWh, which corresponds to 60% of the total 75 TWh produced in the country. Also, Belgium imports electricity from the French State utility EDF. Belgium is legally entitled to some regular inputs since it has a share in the two 1,450 MWe PWRs at Chooz (the Belgian national utility Electrabel owns 25% of the two reactors); the Chooz plant is located on the River Meuse close to the Belgian border, in a peninsula-like part of France which reaches into the neighbouring country. Belgium had formally participated in the French licensing process, since most of the territory inside a 5-km circle around the plant is Belgian, and since the River Meuse carries the liquid radioactive discharges directly into the country.

According to the Belgian government, "there is no intention to construct a new nuclear power plant in Belgium in the short term".

Synatom, the Belgian company responsible for nuclear fuel management (most of the fuel operations except fuel fabrication) signed reprocessing contracts with France's COGEMA state nuclear fuel company in the early 1970s. These first contracts correspond to 139 MT of spent fuel from the Tihange and Doel plants, to be reprocessed at the UP2 plant at La Hague. This spent fuel was reprocessed before the beginning of the 1990s, when the new plants at La Hague started active operations. Synatom took a 6.6% share of the UP3 plant's production capacity during its first ten years of operation (7,000 MT), which corresponds

to 464 MT. The rest of the decennial capacity was shared between other non French customers of COGEMA of which German and Japanese customers hold about 80%. Synatom later contracted a further 66 MT to be reprocessed at La Hague and in 1990 agreed to some "Post-2000" reprocessing contracts, which were to be confirmed by year 1995. These Post-2000 contracts were not confirmed, following the 1993 resolution by the Belgian House of Representatives (Cf. article on page 4). According to this resolution the plutonium separated at the La Hague plants from Belgian spent fuel should be used to produce MOX fuel for unit 2 of the Tihange PWR and unit 3 of the Doel plant. Accordingly, MOX has been loaded into these reactors since 1995.

Reprocessing Waste

Reprocessing in France of Belgian spent fuel has produced substantial quantities of radioactive waste. Most of the reprocessing contracts stipulate that the waste is to be sent back to Belgium. Only the 39 MT, which were reprocessed in the UP2 plant, correspond to contracts exempt of a waste return clause. However, French Law stipulates: "The storage of imported radioactive waste in France is prohibited beyond the necessary technical delays due to its reprocessing, even if it has been reprocessed on French territory" [30 December 1991 Act]. This is generally understood as meaning that all the reprocessing waste is to be sent back to the foreign customers after a delay of a few years (certainly less than five) which are required to cool down high and some of the intermediate level waste. Most of the reprocessing waste, which is less active, does not require any cooling period before shipment. Also, French Law does not make a distinction whether there is a return clause or not in the reprocessing contract. However, as of Autumn of 1998, not a gramme of any kind of reprocessing waste has yet been sent back from La Hague to Belgium.

Revealing Government Declaration on Low-Level Waste

Elio Di Rupo, then Energy Minister, answered written parliamentary questions concerning radioactive waste on 18 February 1998. The answers he gave initiated a controversy since this was the first time a country client of the COGEMA reprocessing plant officially admitted that low-level radioactive waste was not to be returned from France. Previously, it was believed Belgium was planning for the return of such waste and had taken it into account in the design of future storage facilities. In response to the question: what is the planned schedule for the return of low-level radioactive waste (so-called Category A or A-level

waste) from the reprocessing of Belgian spent fuel at the La Hague reprocessing plant, the Minister replied: "The execution of the reprocessing contracts does no longer plan the return to Belgium of A-level waste". And to the question: how was it the quantity of A-level radioactive waste had been reduced since the previous official estimate, the Minister replied "12,000 m³ A-level waste from the reprocessing of fuel is not taken into account anymore". These answers, together with other declarations from the Minister on the same subject, provoked comment in the national Press and a press release from the Belgian Greenpeace office. The Minister's office itself then issued a press release stating that it would respect all the international engagements and bilateral engagements with France it had signed, and that all the reprocessing waste in France from Belgian spent fuel would be sent back to Belgium. The whole matter is typical of the information concerning reprocessing. COGEMA and its customers have agreed to bypass the regulation, and the less information they give to the public the less explanation they have to give of what is actually planned. What COGEMA is currently saying on the issue is that it is planning new conditioning processes for the reprocessing waste, which would significantly concentrate and compress low-level radioactive waste. Such waste would be incorporated with high-level radioactive waste from reprocessing, and thus effectively no low-level radioactive waste should be generated. However, this planned modification of the reprocessing processes does not affect the waste which has already been generated. Belgian spent fuel has been reprocessed in France since the middle of the 1970s and low-level radioactive waste produced from the reprocessing of Belgian spent fuel has been stored in a final storage facility called the Centre de stockage de la Manche, which is adjacent to the La Hague reprocessing plant. The French administration does not seem to mind this fact and has not expedited the processing of a complaint which was filed as early as January 1994 by then Green European Member of Parliament, Didier Anger, who lives close to La Hague. COGEMA does not intend sending back the actual waste arisings which were physically produced during the reprocessing of the spent fuel from any given country; rather the company is keeping an account based on complex equivalency calculations for the (future?) attribution of the waste. To complicate things further, the Belgian waste management agency, ONDRAF, has stated that waste generated at La Hague under the first reprocessing contracts, which did not contain a return clause for waste, would not be sent back - whatever the current legal situation in France. Trouble inevitably lies ahead.

THE FAILURE OF EUROCHEMIC

The Dessel/Mol nuclear has been the site of the Eurochemic reprocessing plant. This plant was the first commercial reprocessing plant in Europe and the first international commercial plutonium project ever. It was built and operated under the responsibility of a consortium of 13 member countries of the Nuclear Energy Agency of the OECD. It was only operated for eight years, from 1966 to 1974. During this period, it did not reach half of its planned throughput. The total amount of heavy metal separated is 185 tonnes of low-enriched uranium, 1.4 tonnes of high-enriched uranium, and 0.7 tonnes of plutonium. The European nuclear industry decided not to support further operation of the plant because of high operating costs and development of other reprocessing plant projects in countries part of the consortium, notably the launch of the La Hague reprocessing plant in 1976. The decision was taken against the lobbying of Belgian government and industry. Dismantling work has been carried out by Belgoprocess at the Eurochemic plant since 1990. Total cost was planned to be BEF 5 billion in 1992. Complete dismantling is not planned for to be achieved before year 2002.

MOX Fabrication

Belgonucléaire produces MOX fuel pellets in the P0 plant at Mol/Dessel. For 15 years-since the middle of the 1980s-this plant has been the largest supplier worldwide of light water reactor MOX. It mainly supplied MOX fuel to Swiss, French and German utilities. Japanese utilities have signed a supply contract and some fuel is planned to leave for Japan in early 1999. The planned sea shipment has already raised concerns because of the environmental and proliferation risks involved. The plutonium for the MOX fuel mainly came from the La Hague reprocessing plant. Some also came from the Sellafield reprocessing plants. Belgonucléaire was planning to build another MOX plant on the same site, which was to be called P1. However, the licensing procedure for this plant was cancelled by a high administrative court.

What Next?

As in 1993, when a parliamentary debate led to the moratorium (Cf. page 4), a debate is planned to take place at the end of this year in order to prepare a vote of a resolution. However, as of the end of September 1998, no official schedule had been decided. In 1993, the discussions lasted several days and had comprised hearings of experts from different countries (including Mycle Schneider from WISE-Paris). The 1998 debate is not expect-

ted to be as important as in 1993. Sources in Belgium say that the Government is only planning for a limited half-day debate. It remains to be seen how the members of parliament will react to such a distortion of the original decision to hold a full-scale debate on the issue.

To be sure, the new attribution of the administration of Energy to Defence Minister Jean-Pol Poncelet (as of June 1998), thus replacing in this task Elio Di Rupo, will affect the process. Elio Di Rupo did not favor much public debate on nuclear issues, neither with public and journalists nor with other members of the Government. But Jean-Pol

Poncelet might become an outspoken MOX lobbyist, since he has been deeply involved with these subjects for many years. He worked for five years as an engineer on MOX issues with Belgonucléaire and later held several top positions in the nuclear administration. The highest responsibility he has had is President of the Board of the National Waste Management Agency ONDRAF, from 1991 to 1995. If waste minimisation is to be a specific goal, government and parliament should quickly agree on the phase out of any plutonium recycle strategy. And in any case ONDRAF will have to manage a significant stock of unprocessed spent fuel.

THE 1993 RESOLUTION

In 1993, for the first time, a parliamentary debate decided on the Belgian national policy concerning MOX and reprocessing. The decisions were to be respected for a five-year period, at the end of which another parliamentary debate is to decide of a new policy.

Following is a large excerpt from the 1993 resolution: "*The House [of Representatives], [...] instructs the Government:*

1) *not to give privilege in the future to the strategy of reprocessing as compared to the storage and to direct disposal (once through cycle). The Government cannot consider anymore reprocessing as the reference strategy. It must create the conditions which enable the development of the strategy of packaging and direct disposal as an alternative;*

2) *during a five year period: - not to execute the contract agreed in 1990; - not to confirm the options which were planned through this contract, which Belgium was to confirm in 1995; - not to negotiate any new contract during this period which is to be devoted to the analysis of the alternatives;*

3) *to give priority to research and development, including on an international level, in order to be able later to opt for the direct disposal of spent fuel, without reducing the current research programme concerning the geological disposal of reprocessing waste. The report which is transmitted each year to the Houses of Representatives by [the national nuclear waste management organisation] ONDRAF will comprise a precise progress report of these research programmes.*

4) *to submit [to the Houses of Representatives] the elements for a new global evaluation of the situation, notably on the basis of the following criteria: non proliferation, management of waste, security, protection of the workforce, of the population and of the environment, and also economic aspects.*

5) *Taking into account the result of the legal analysis requested by the Government and the House of Representatives concerning the economic consequences which would follow cancellation of the reprocessing contract signed in 1978, to allow the fulfillment of the contract. The Government will examine the possibility of transmitting to a third body part of the reprocessing capacities of the spent fuel which has not yet been sent to La Hague;*

6) *To allow for the use of the plutonium which has been separated with the 1978 reprocessing contract in the Belgian nuclear power plants, based on the analysis of possible usage and the results of the safety analysis. The latter notably plans that the power plants not be modified; [...]*

11) *to have the Federal Agency for Nuclear Control operational as soon as possible, after the Bill is adopted by the Houses of Representatives."*

There are three points of this resolution which have not been properly respected. The first one concerns reprocessing contracts - a reprocessing contract was signed with the French reprocessor COGEMA for the reprocessing of spent fuel from the demonstration 11 MWe BR3 pressurised water reactor (PWR), which was definitely shut down in 1987. The second point concerns the "Federal Agency for Nuclear Control". This organisation still does not exist five years after the House of Representatives requested its establishment "as soon as possible". Sources in Belgium suggest that this Agency will be created shortly. However, its planned statutes and selection of future staff have been criticised, notably by the Green MP Martine Dardenne. It seems that the new organisation will mainly hire current representatives of the nuclear industry, which will not favor its independence. The third point is that reprocessing is still considered to be the reference scenario. No plans have been made, no national studies have been carried out on the direct storage of spent fuel.



Who's Who ? In Belgium

STATE and INDUSTRY

Belgoprocess

Belgoprocess is the operating arm of the national waste management agency ONDRAF/NIRAS. It operates conditioning facilities for nuclear waste at Dessel/Mol.
GRAVENSTRAAT 73 - B-2480 DESSEL
TEL: +32 14 33 4111 - FAX: +32 14 31 3012

Belgonucléaire

Belgonucléaire, half owned by the Belgian Kingdom and half owned by Tractebel/Electrabel, operates the MOX fuel fabrication plant at Dessel/Mol. A lion share of this MOX fuel was purchased by foreign utilities and made from plutonium separated at the French La Hague plants.
EUROPALAAN 20 - B-2480 DESSEL
TEL: +32 14 33 0211 - FAX: +32 14 31 7046

Electrabel

Electrabel is by far the largest electricity utility and has a de facto monopoly position in Belgium. It operates the seven nuclear power reactors in the country. Shares: 40% Tractebel, 5% mixed municipalities, 53% on stock exchange.
BD DU R...GENT, 8 B-1000 BRUXELLES
TEL: +32 2 518 62 62 - FAX: +32 2 513 83 43
Web page :<http://www.electrabel.be/en/ssi/index.htm>

FBFC-International in Dessel/Mol

FBFC-International is a wholly owned subsidiary of the French FBFC, which is owned 51% by the French Framatome and 49% by the COGEMA. FBFC operates a uranium fuel fabrication plant, and also produces MOX fuel assemblies from MOX pellets produced by Belgonucléaire's P0 plant.
EUROPALAAN 12 - B-2480 DESSEL
TEL: +32 14 33 1211 - FAX: +32 14 32 3614

Ministry for Interior Affairs

Jan Michiels, a member of the Flemish Socialist Party (SP), advisor on nuclear safety to the minister for Interior Affairs. Mr. Michiels was notably very active in preparing the participation of the socialist Members of Parliament in the 1993 MOX/reprocessing debate.
JAN MICHIELS - SECR...TAIRE POUR LA S...CURIT...
NUCL...AIRE - MINISTÈRE DES AFFAIRES
INT...RIEURES 60, RUE ROYALE - B-1000 BRUXELLES
TEL: +32 2 504 8511 - FAX: +32 2 504 8500

Administration of Energy

Jean-Pol Poncelet is both Minister for Defense and in charge of Energy in Belgium.
RUE LAMBERMONT 2 - B-1000 BRUXELLES
TEL: +32 2 550 2811 - FAX: +32 2 550 2919

ONDRAF (in French) - NIRAS (in Dutch)

ONDRAF (Organisme national des déchets radioactifs et des matières fissiles enrichies) is the national radioactive waste management organisation. It is formally responsible for enriched fissile materials, while Synatom manages the Belgian nuclear fuel.
1, PLACE MADOU - BP 25 - B-1210 BRUXELLES
TEL: +32 2 212 1011 - FAX: +32 2 218 5165

The Belgian nuclear research center SCK-CEN performs research and industrial operations of management of radioactive waste and of decommissioning of nuclear facilities. Notably SCK-CEN is currently dismantling the demonstration BR3 pressurised water reactor and the Eurochemic reprocessing plant.

PR SERVICE: ANNE VERLEDENS
BOERETANG 200 - B-2400 MOL
TEL: +32 14 33 25 86 - FAX: +32 14 33 25 84
e-mail: averlede@sckcen.be
Web page: <http://www.sckcen.be/>

... a company owned by Tractebel/Electrabel to manage the nuclear fuel chain for the nuclear power plants and is responsible for the following: uranium supply, conversion and enrichment, spent fuel interim storage and conditioning, spent fuel reprocessing. Fuel fabrication is under Electrabel's responsibility. Through a golden share, the Belgian federal government has the right to veto any decision of Synatom's board.

13, AVENUE MARNIX - B-1050 BRUSSELS
TEL: +32 2 505 0711 - FAX: +32 2 505 0790

OPPOSITION ACTIVITIES and CONTACT ADDRESSES

Greenpeace-Belgium

The Belgian Greenpeace office has put considerable attention to the plutonium issue over the last five years. It notably campaigned against MOX use and reprocessing contracts with La Hague.

GREENPEACE BELGIUM - JAN VANDE PUTTE
VOORHUITGANGSTRAAT 317 - B-1030 BRUSSELS
TEL: +32 2 201 1944 - FAX: +32 2 201 19 50

Eloi Glorieux

Eloi Glorieux, former nuclear campaigner for Greenpeace International in Brussels, has been very active on plutonium and on nuclear waste issues for many years. He is now working for War Resisters International (WRI - Forum voor Vredesaktie) which is more active on military nuclear issues.

FORUM VOOR VREDESAKTIE
VZW VAN ELWIJCKSTRAAT 35 - B-1050 BRUSSELS
TEL: +32 2 648 7583 - FAX: +32 2 640 0774

For Mother Earth

This group has carried out actions against nuclear transports in Belgium and organised the Walk of a Nuclear-Free Future. The Gent based office is the office of the international network of For Mother Earth.

POL D'HUYVETTER - FOR MOTHER EARTH
LANJE STEENSTRAAT, 16 D - B-9000 GENT
TEL/FAX: +32 9 233 8439
e-mail: pol@motherearth.org

University of Antwerp - STEM Department

Economics Professor Aviel Verbruggen specialises on energy issues and has been working on the economics of nuclear phase out in particular.

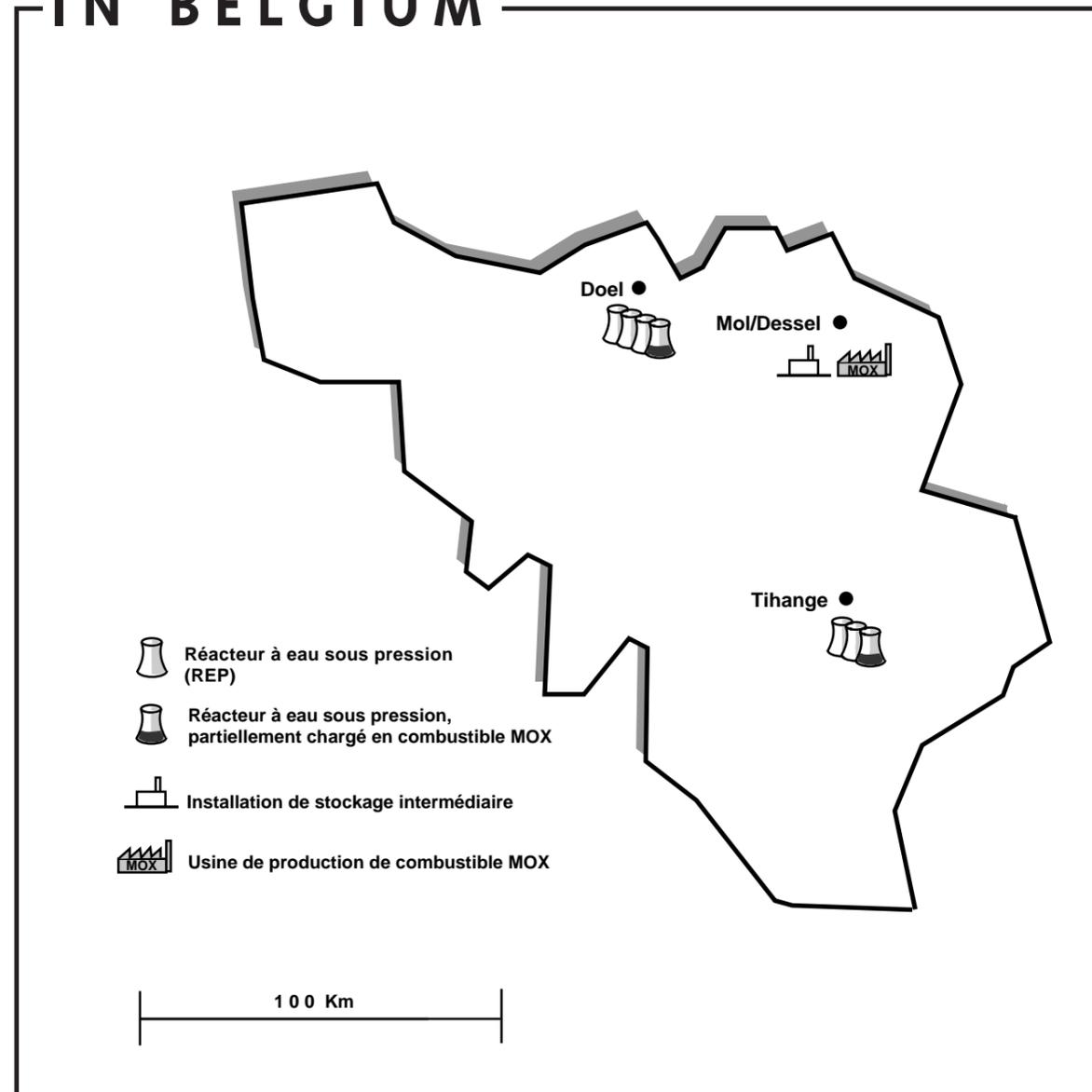
UFSIA - STEM DEPARTMENT
KLEINE KAUWENBERG 12 - B-2000 ANTWERP
TEL: +32 3 220 4900

Chambre des Représentants

Olivier Deleuze, MP, member of the Ecolo Party
CHAMBRE DES REPR...SENTANTS - B-1008
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TEL: +32 2 549 4517

Martine Dardenne, Senator, Member of the Ecolo party
S...NAT - B-1009 - BRUXELLES
TEL: +32 2 501 7070

Plutonium IN BELGIUM



SEVEN PRESSURISED WATER REACTORS (PWRs) IN OPERATION

- 5 PWRs not licensed for MOX use
- 2 PWRs using MOX fuel (There are also two PWRs at Chooz in France near the Belgian border, operated with Belgian participation).

ONE MOX FUEL FABRICATION PLANT

- P0, at Dessel/Mol (about 35 MT nominal annual capacity), which produced 345 MT MOX fuel as of end of 1997.

ONE NUCLEAR RESEARCH CENTER

- SCK/CEN at Dessel/Mol, which has carried out experiments on MOX fuel.

ONE HIGH ACTIVITY WASTE INTERIM STORAGE FACILITY

- Dessel/Mol

FIGURES OF THE MONTH

Annual figures for holdings of civil unirradiated plutonium	As of 31. Dec. 1996 Rounded to 100 kg plutonium
1. Unirradiated separated plutonium in product stores at reprocessing plants	—
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.	2,600 kg
3. Plutonium contained in unirradiated MOX fuel or other fabricated products at reactor sites or elsewhere.	100 kg
4. Unirradiated separated plutonium held elsewhere	negligible
TOTAL (this line does not exist in the official document)	2,700 kg
<i>Notes:</i> (i) Plutonium included in lines 1-4 above belonging to foreign bodies: 0 (ii) Plutonium in any of the forms in lines 1-4 above held in locations in other countries and therefore not included above: 0 (iii) Plutonium included in lines 1-4 above which is in international shipment prior to its arrival in the recipient State: 0	

Estimated amounts of plutonium contained in spent civil reactor fuel	As of 31. Dec. 1996 Rounded to 1,000 kg plutonium
1. Plutonium contained in spent fuel at civil reactor sites	12 tonnes
2. Plutonium contained in spent fuel at reprocessing plants	—
3. Plutonium contained in spent fuel held elsewhere	—
TOTAL (this line does not exist in the official document)	12 tonnes

(Source: Permanent Mission of Belgium to IAEA, 12 December 1997)

This table should contain more explicit data. It can be noted, for instance, that while the International Guidelines for the Management of Plutonium - which have been adopted by Belgium - explicitly call for the publication of figures on the plutonium inventory covering two years (as of 31 Dec. of one year, and in parentheses the previous years' figures), Belgium has only published values for one single year.

THE WORD OF THE MONTH

Former US Government Official Recommends Plutonium/Spent Fuel Swap

Prof. Frank von Hippel, physicist at Princeton University, and former assistant director for national security in the White House Office of Science, recommends an original approach for the management of the stockpile of British plutonium. As stated in *Plutonium Investigation* N°3, while there is no currently agreed planned use for separated plutonium in the United-Kingdom, the industry is still producing separated plutonium and worsening the problems concerning the management of its stockpile of this nuclear material.

"The enormous accumulation of separated civilian plutonium represents a global security threat

that can no longer be ignored. The surest anti-proliferation measure is to stop reprocessing spent fuel and to reduce the quantity of separated plutonium in store". Von Hippel proposes that the British exchange separated plutonium together with radioactive waste against spent fuel under reprocessing contract from other countries - that is swapping the nuclear components before and after reprocessing. This would result in the reduction of the total quantity of reprocessed spent fuel and thus of separated plutonium. A good idea. But there is a strange error and a missing link in this article signed by one of the major experts on plutonium on the planet. The error first: "France does not have a large domestic stockpile of plutonium with which it could carry out similar trades". While Britain's civil plutonium stockpile is - yet - larger

than that of France, the French utility EDF stockpiles currently more than 40 metric tons of plutonium (as compared to some 60 tons in the UK). Not so little either! Then the missing link: Any such trade would not solve the management problem of the other country recuperating the separated plutonium of any stockpile. MOX or waste, Mr. Hippel?

PS: By the way, the French plutonium stockpile increased by more than a factor of 20 since the country started using MOX in 1987 as a means... of avoiding a plutonium surplus.



UK Health and Safety Executive: Safety Audit of Dounreay 1998

The Dounreay nuclear establishment on the Northern coast of Scotland, where were operated the key demonstration facilities of the British plutonium industry, is going through troubled waters again. Although the Government had declared that

the reprocessing plant on site would not engage into further reprocessing contracts and following an incident which led to a dangerous sixteen hour power cut, the Health and Safety Executive (HSE) decided on a crash safety audit of the plant. The HSE report is refreshingly clear and states that "much has to be done to improve safety at Dounreay to bring it up to the standards HSE requires for continued operation of a nuclear installation and to enable Dounreay to be safely decommissioned and made safe for future generations". Operations in the fuel cycle area are currently shut down and will need HSE approval to restart. A Must if you want to know how many things can go wrong on a single nuclear site.

150 pages, order from HSE Books - PO Box 1999 - Sudbury - Suffolk CO10 6FS
 TEL: +44 1787 881165 - FAX: +44 1787 313995
 The Dounreay Safety Audit is also on the web:
<http://www.open.gov.uk/hse/nsd/dounreay.pdf>

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"La France Nucléaire 1997", Mary Byrd Davis, WISE-Paris, 256 pages; 120 FRF + 25 FRF for postage

"Comprehensive Impact Assessment of the Use of MOX Fuel in Light Water Reactors", Jinzaburo Takagi, et al., CNIC, Tokyo, 335 pages; 400 FRF (NGOs 160 FRF) + 60 FRF postage + VAT for Europe (contact CNIC for US and Asia, fax: 81-3-53 30 95 30).

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