

THE DISARMAMENT MYTH OF PLUTONIUM FUEL PRODUCTION

Introduction

Under the banner of nuclear disarmament Europe and the United States are proposing to provide billions of dollars to Russia to allow it to make a nuclear fuel from the plutonium taken from dismantled nuclear weapons. Superficially this sounds like a worthy project, one which will make the world a safer place by reducing the number of nuclear weapons and using the dangerous ingredient from them to produce electricity. Tragically, this is a myth which is being peddled by the nuclear industry and the Western nuclear states. In fact, the process of manufacturing mixed oxide plutonium fuel or MOX, will produce more plutonium than is burnt as fuel (see explanation below), will increase risks of nuclear weapons proliferation and will severely contaminate the Russian environment.

MOX Production Versus Immobilisation

Plutonium, with a radioactive half-life of 24,000 years, is a substance that cannot be “destroyed”, but can only be made more or less accessible. Therefore, the obvious route for disposition is to immobilise the plutonium by bringing it into a stable form of a ceramic or glass, to protect it and to store it at a secure site. The immobilised plutonium would then be inserted into a container of high level nuclear waste, providing a deadly radioactive shield making it extremely difficult and hazardous to remove. This is the so-called ‘can-in-canister’ method.

The second way of dealing with the surplus weapons plutonium is to make a reactor fuel by combining the plutonium with uranium to form MOX fuel. This is currently the favoured option of the nuclear industry, the US government and European Commission which are currently seeking ways to fund such a programme. However, there are intrinsic flaws in the idea of MOX production as a method of disposing of plutonium. MOX use actually increases the risks of nuclear weapons proliferation, nuclear accidents and environmental contamination.

Burning MOX fuel in reactors actually produces more plutonium than existed in the original MOX fuel because some of the uranium oxide in MOX, when burnt in the reactor (irradiated), changes into plutonium. MOX fuel is also far less dangerous to handle than the highly radioactive spent or burnt nuclear fuel. Therefore, terrorists or national governments which want access to plutonium to build nuclear weapons, would require far less technical expertise to extract it from MOX than from spent nuclear fuel. Therefore, the production, transport and storage of MOX fuel present a major nuclear proliferation threat.

To separate the plutonium from spent nuclear fuel, the spent nuclear fuel must be reprocessed. This means the fuel is chopped up and dissolved in acid to isolate the plutonium. The process is an essential stage of MOX fuel production, it is also one of the most polluting industrial process and creates a massive amount of nuclear waste from, for example, all the machinery, buildings, liquids and chemicals used, filters and clothing of the workers. According to a 1997 study of La Hague reprocessing plant, reprocessing produces 20 times more radioactive waste than if the spent fuel is directly packaged for long-term storage or the nuclear industry’s alternative of dumping underground. The reprocessing facilities of the French-government owned Cogema at

La Hague, in Normandy, create about 500 million litres of radioactive waste a year which are discharged to the sea. Those of British Nuclear Fuels Ltd at Sellafield discharge about 3,000 million litres of radioactive waste every year.

Plutonium MOX fuel increases the risk of a nuclear accident

There is no commercial experience with nuclear reactors burning MOX containing weapons-grade plutonium. Most nuclear power stations were designed and built to use only uranium fuel. When plutonium MOX fuel is placed in the reactor the safety of the reactor is reduced. This is because plutonium is more 'reactive' - which is why nuclear bomb makers like it. This increase in 'reactivity' inside the nuclear reactor is more than the original reactor designs allowed for. MOX fuel becomes hotter and more radioactive than the normal uranium fuel and this can lead to the reactor safety margins being reduced. The presence of MOX also leads to a substantial decrease in the efficiency of the reactors control rods which are used to shut down the chain reaction in the event of an emergency.

According to the Washington-based Nuclear Control Institute¹, MOX use in Russian reactors significantly increases the operational risk of a nuclear accident. In addition, the consequences of a severe accident would lead to higher number of cancer deaths due to the higher levels of radioactivity in the reactor which would in turn be released into the environment. The current plan calls for up to 2 tons of plutonium to be loaded in Russian VVER-1000 nuclear reactors each year, as well as two fast breeder reactors. All of these reactors are of Soviet design and have already had nuclear incidents and accidents even without MOX fuel.

The Plutonium Traffickers

Over the last six decades almost 1,400 tons of plutonium have been produced for military use and as a by-product from irradiating Uranium fuel for electricity production. The largest amount of plutonium (67.5%) is contained in Spent Nuclear Fuel (SNF) from nuclear reactors. While the plutonium remains in the SNF it is extremely difficult to access and to use for military purposes. It is therefore the stockpiles of separated military and civil plutonium that present the greatest threat in terms of nuclear weapons proliferation.

The world's plutonium stockpile (in tons)

Military :	255	
Russia		137
United States		100
Others		18
Civil contained in Spent Nuclear Fuel:	920	
Civil separated by civil reprocessing:	193	
TOTAL:	1,368	

Source: ISIS, 2000

Some 237 tons or over 90% of the worlds military produced plutonium stockpiles are owned by the U.S. and Russia. In 1995 they each declared that 50 tons of this plutonium was now "surplus"

¹ "Weapons plutonium MOX in nuclear reactors" the following source should be given:
 Dr. Edwin Lyman, NCI Scientific Director, May 2000: "The Safety Risks of Using Mixed-Oxide Fuels in Russia's VVER-1000 Reactors: An Overview"

to requirements. In September 2000 the U.S. and Russia signed an agreement to each remove 34 tons of their plutonium stockpile and to 'dispose' of it. They also decided to dispose of the majority of their 34 tons of 'surplus' weapon's plutonium (U.S. 75%, Russia 100%) by using it in plutonium mixed-oxide fuel or MOX.

MOX option driven by the interests of plutonium industry not the interest of nuclear non-proliferation and the environment

The MOX option for 'disposing' of weapons plutonium has been determined following extensive lobbying by the global nuclear industry, in particular the commercial or 'civil' plutonium companies in western Europe led by Cogema, British Nuclear Fuels (BNFL) and Belgonucleaire. As their traditional commercial operations have started to decline, they have identified an opportunity to extend their core business through providing a 'solution' to the plutonium problem. The tragic irony is that it is these same companies that created a large part of the global plutonium problem. BNFL and Cogema currently have over 150,000 kg of plutonium stockpiled at their two reprocessing sites, Sellafield and la Hague. Cogema is currently the lead company for building the MOX plant in Russia. The use of MOX fuel will lead to further radioactive contamination of the Russian environment, as well as increasing the risk of a serious nuclear accident. The production, transportation, storage and handling of plutonium MOX fuel in the Russian Federation will increase the opportunities for the diversion or theft of these materials, in a country which already has a major security problem at its nuclear sites.

The Russian MOX program - subsidies for a new 'Plutonium Economy'

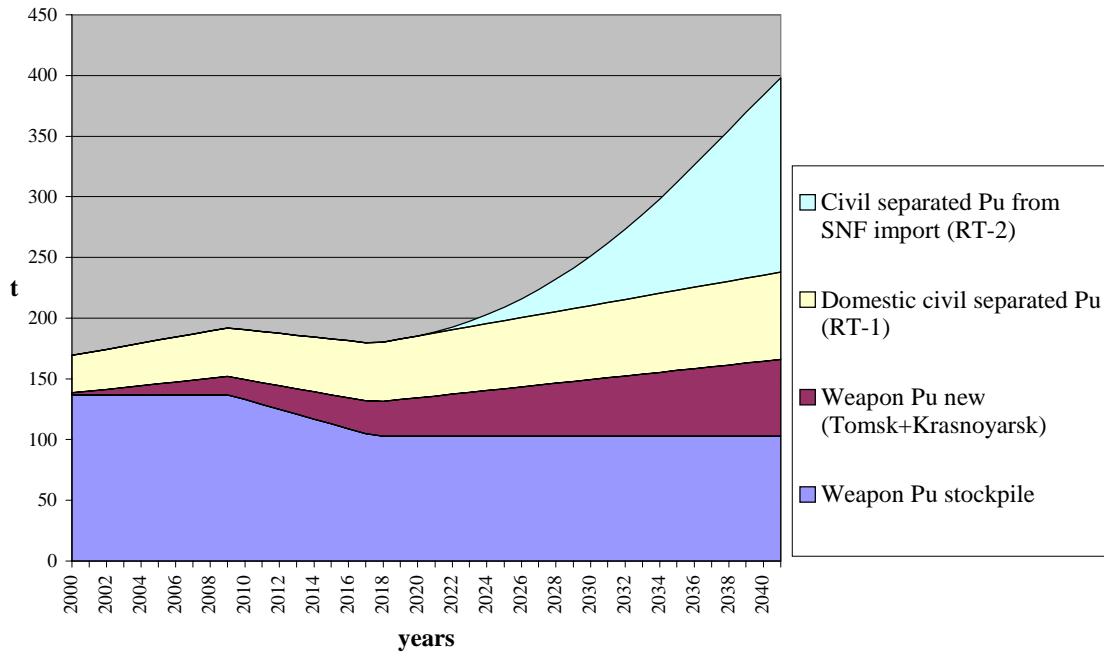
A February 8th 2001 document from the Russian government further proves the country's intention to expand its nuclear industry using western financial aid. The billions of 'disarmament dollars' being sought by Russia will not reduce the nuclear threat in Russia but will be used to fuel an expansion in Russia's plutonium industry.

The Russian Ministry of Atomic Energy (MINATOM) is planning to construct and operate a new generation of Fast Breeder Reactors (FBR). These reactors are fuelled with MOX, and are designed to produce hundreds of kilograms of weapons-grade plutonium. Currently, Russia does not have a MOX fuel production facility, nor can it afford to build one. Therefore, the Russian nuclear industry, like its counterparts in BNFL and Cogema have identified a unique opportunity to establish an industrial scale MOX facility and 'plutonium economy', paid for by foreign countries under the guise of disarmament. As a direct result of this support for Russia's nuclear program, MINATOM will move to complete its partly-built reprocessing plant RT-2, and construct FBR's with the objective a full-scale plutonium infrastructure.

- If implemented as proposed the military plutonium stockpiles of 137 tons will be decreased by 34 tons during the period from 2010 to 2018 to 103 tons.
- Currently in Russia each year 1.5 tons of military plutonium is produced at the three production reactors at Tomsk (2) and Krasnoyarsk. It is then reprocessed and stockpiled. An US/Russian agreement to stop plutonium production by the year 2000 has been ignored. There is no agreement in place for when these reactors will be shut down.
- Currently in Russia 1 ton of civil plutonium is separated at the RT-1 reprocessing plant at Mayak adding to the 30 tons of separated civil plutonium already stockpiled as of 2000.
- According to Minatom's plans in the period from 2020 to 2041 160 tons of plutonium from imported SNF will be reprocessed using the completed RT-2 facility at Krasnoyarsk and a modified RT-1 at Mayak.

As the chart below shows, the consequence of these plans will be *more* separated , not *less* separated plutonium .

Russia: Separated Plutonium (in t)

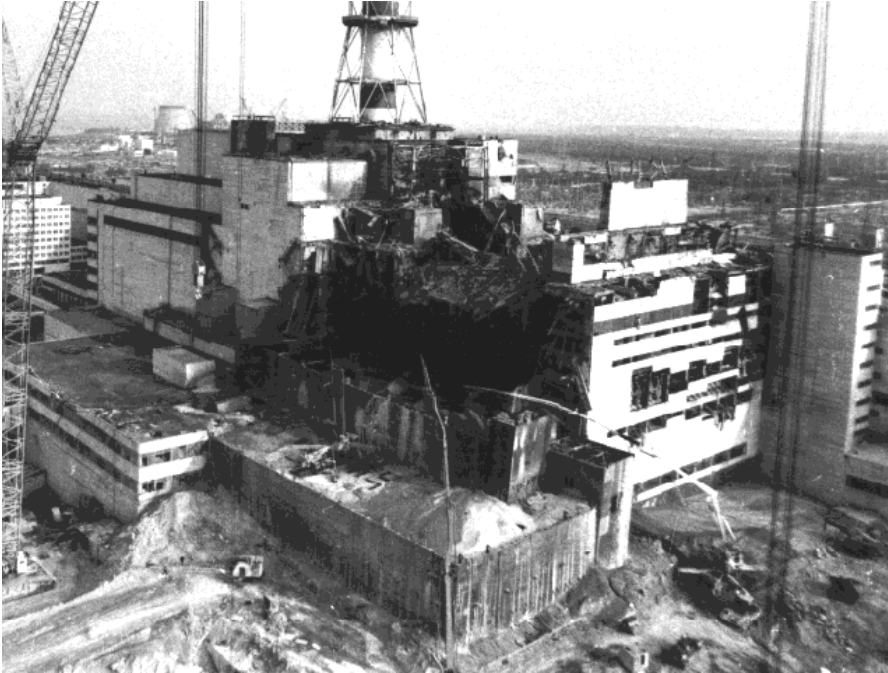


Russia's growing separated plutonium stockpiles under the MOX program

Chart: Greenpeace

Sweden and Switzerland helping out

Doubts over the availability of billions of dollars to fund the plutonium program in Russia have led MINATOM to propose the leasing of MOX fuel to reactors outside the Russian Federation. British Nuclear Fuels Ltd (BNFL) is also backing the leasing scheme. Specifically, it has been proposed that reactors operating in Western Europe and East Asia would be loaded with MOX fuel produced from Russian nuclear warhead plutonium. The MOX fuel would only be leased to the reactor operator and would remain the property of Russia. Once used, the spent nuclear MOX fuel would be shipped back to Russia for reprocessing or disposal. In the last months it has been confirmed that there is support for such a plan in Switzerland and Sweden. In the case of Sweden, no reactor is currently licensed to use MOX fuel, although the government is currently considering granting one. In the case of Switzerland, MOX fuel from the UK and Belgium is used in two reactors. In both cases Greenpeace believes that the motive on the part of the reactor operators is to delay the shut down of their reactors by entering a MOX program that will take decades to fulfil. At the same time they hope to receive subsidised nuclear fuel, and export their spent MOX fuel waste back to Russia.



Chernobyl - "peaceful Atom" of Soviet design released 200 times more radioactivity into the environment than from the nuclear bombing of Hiroshima and Nagasaki Photo: Tripod

European Union financing key for Russian MOX program

Prior to starting the US\$ 1.9 billion project, commitments over at least the "Research, Development & Pre-Capital Costs" (US\$ 172 million) as well as the "Design & Construction of Facilities & Equipment Costs" (US\$ 610 million) have to be made. But, so far the G8 countries have firmly committed some US\$ 625 million: US: US\$ 400 million², France: US\$ 120 million, UK: US\$ 105 million.³ A significant part of the gap is now expected to be closed by European Union funding.

On December 17, 1999, the European Council established the "European Union Co-operation Programme for Non-proliferation and Disarmament in the Russian Federation". Currently the European Commission (DG External Affairs, Commissioner Chris Patten) is setting up a "Unit of Experts" under this programme.

The G8 Plutonium Disposition Program Group (PDPG) meeting (March 6/7) and the Non-proliferation and Disarmament Co-operation Initiative (NDCI) meeting (March 8/9) will both take place in Brussels to discuss further EU financing of the Russian MOX. The EU is holding these talks behind closed doors, and has failed to even notify the European Parliament.

² US\$ 200 million are committed, another US\$ 200 million still have to be approved by the U.S. Congress

³ Germany is going to to commit some US\$ 100 million exclusively for immobilization and not as part of the MOX program; Japan is committed to a separated bi-lateral disposition project with Russia US\$ 35 million worth; the G8 countries Italy and Canada have so far refused to commit funds for plutonium disposition.

No dirty nuclear project in Eastern Europe without the EBRD

On December 20th, G8 experts discussed the funding *mechanism* and identified the European Bank for Reconstruction and Development (EBRD) as the most appropriate institution for the disbursement of funds for the Russian MOX program. The EBRD has a record of working on uneconomic and risky nuclear projects in Eastern Europe: the failed attempt of financing the completion of the Mochovce reactors in Slovakia and the embarrassing approval for the financing of the controversial “K2R4” reactors in Ukraine have given the EBRD the reputation of being the world’s most irresponsible international financial institution.

Conclusion

The global problem of plutonium is a clear and present danger to international security. Russia’s stockpile of plutonium is part of the problem, but so to are the global stocks of commercial plutonium – all of which can be used to make nuclear weapons. Only a few hundred kilometres from Brussels lies the world’s single largest stockpile of plutonium at Cogema’s reprocessing site at la Hague in Normandy, France. Last year that stockpile grew by 8,000kg – four times what is to be ‘disposed of’ in Russia each year.

The plutonium problem will not be solved by the MOX option. Instead, Russia’s nuclear infrastructure will be expanded into a new era of large-scale plutonium use in already dangerous reactors. New plutonium fuel facilities, reactors, and reprocessing plants are being planned by the Russian Ministry of Atomic Energy, aided and abetted by the European Commission, and European taxpayers. There has been no open debate about EU funding for this dangerous program, either at an EU parliamentary level or national level. This lack of transparency is not surprising given the players in this nuclear game: the secretive plutonium industry, the Russian Ministry of Atomic Energy and the European Commission. Left behind closed doors, hundreds of millions of Euros will be channelled into the Russian and European nuclear industries, increasing the environmental, security and proliferation risks of plutonium.

All plans to fund the Russian MOX program should be abandoned, with priority instead being given to a comprehensive program of securing, as quickly as possible, existing stocks of plutonium and the halting of any further reprocessing in Russia and in the European Union. A well-funded research and development program for alternatives to MOX, including immobilisation, should be undertaken immediately.

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