

# NUCLEAR MONITOR

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## GRUESOME EIGHT TO STRIKE AGAIN

**On the back of recent announcements by Russia, confirming that it will build new nuclear power plants, and by the UK, which says it supports new nuclear build, the G8 is expected to push further ahead with its proposals for the global expansion of nuclear power.**

**(648.5758) WISE Amsterdam** - The news that a draft Communiqué on "Energy Security" to be released by the Group of Eight (G8) leading industrialised nations at its annual Summit would call for the global expansion of nuclear power was first publicised when the draft document was leaked to the Reclaim the Commons movement in March. (For March draft go to <http://robedwards.typepad.com/robedwardsinfo/files/G8EnergyPlanMarchdraft.pdf>)

At the March G8 Energy Ministers Meeting, Russian President Vladimir Putin had given the first signal that the G8 Summit in July would be used to promote the global nuclear industry. Putin called for "the equal and discrimination-free access to nuclear technologies for all countries", U.S. Energy Secretary Samuel Bodman said, "We are very hopeful for a very substantial rebirth of the global nuclear industry" and a joint statement released by the ministers said, "For those countries that wish, wide-scale development of safe and secure nuclear energy is crucial".

The action plan for "Global Energy Security" is to be agreed at the Summit being held in St Petersburg, Russia from July 15 - 17 and will advocate the construction of a network of nuclear

power plants in G8 countries and the widespread sale of reactors to developing countries - as long as they agree not to develop nuclear weapons.

The latest version of the draft document, leaked on this occasion to the *Sunday Herald*, reportedly includes the re-introduction of the failed and fantastically expensive technology of fast breeder reactors, which were abandoned in the UK, France and Germany in the 1990s. (For May draft go to <http://robedwards.typepad.com/robedwardsinfo/files/G8EnergyPlanMaydraft.pdf>)

The plan would prohibit countries outside the exclusive Group of Eight from enriching uranium or reprocessing spent nuclear fuel, instead countries would be able to purchase nuclear fuel and reprocessing countries from G8 countries - no doubt at astronomical rates. The draft document says, "Those of us who have plans relating to the use and/or expansion of nuclear energy believe that its development will promote prosperity and global energy security..." and "Participation of developing countries in a 'shared nuclear energy system' through developing the network of international centres providing nuclear fuel services could be a viable option for reducing their energy poverty and bridging the

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energy gap." Yet again it would seem that the world's richest nations are on course to palm off their dodgy goods and technologies on the poorest nations under the guise of assisting development.

Shaun Burnie from Greenpeace International said, "We've come to expect double standards and dangerous hypocrisy from the G8 but this year they are set to surpass themselves." "On the one hand we have the endorsement and promotion of the most dangerous nuclear technology ever conceived - plutonium fast breeder reactors and reprocessing - while at the same time condemning the nuclear proliferation threat from Iran and North Korea."

Italy and Germany are the only G8 countries understood to be wary of the plan - the UK, U.S., Canada, Japan, France and Russia are all said to be enthusiastic, possibly because their countries nuclear industries could benefit handsomely financially from increased global nuclear business. Although German nuclear companies also stand to gain from new nuclear expansion, the government is still believed to be sticking to its pledge to shut down the country's nuclear power stations. At the March G8 energy ministers meeting, Germany sought to distance itself from the draft, it spokesman saying that the Communiqué "does not represent Germany's position at all", adding that the proposals were not acceptable to Berlin.

#### Russia's special interests

Russia's Vladimir Putin, who leads the Summit this time round, put the issue of global energy security at the top of the agenda. As with all leaders hosting a G8 Summit, Putin is also pushing his own special agenda - a proposal for the mass production of floating nuclear power plants. The idea of the floating nuclear plant was developed by Russia and has been around for several years now. The concept seemed so implausible that most observers,

including the *Nuclear Monitor*, had thought it would always remain an idea until last month when Moscow confirmed that it had finally signed a contract for the construction of the first such unit.

## African countries urged to ratify nuclear-free treaty

Nigeria's Foreign Minister Oluyemi Adeniji appealed to African Union (AU) members to act urgently to ratify a treaty aiming to stop nuclear proliferation. The African Nuclear Weapons Free Zone Treaty as adopted in 1996 and requires ratification by 28 member states for it to come into force - so far only 20 of the 53-member states of the AU have taken steps to ratify. Adeniji said, "It is embarrassing that African states who should have been at the forefront to enforce the treaty have failed to ratify it".

The treaty bans research into nuclear explosive devices, prohibits the dumping of radioactive wastes and other radioactive materials anywhere within Africa but does support the use of nuclear science and technology for so-called 'peaceful' means.

**Reuters, June 1 2006**

Mikhail Kovalchuk, director of Russia's Kurchatov Institute Research Centre (a nuclear energy research and development institution directly under the government), in a document - Russia's energy security proposals for the international community - on Russia's official G8 website shared his country's suggestions for ensuring energy security around the world. Kovalchuk, echoing his master's voice, offers floating nuclear plants as a good solution to the long and complicated process of nuclear construction that usually involves major outlays and individual designs. Instead of the established systems, nuclear power plants could instead be produced in "batches" to reduce the duration of construction and control/simplify the process, eventually leading to the standardisation of reactors, which would thus lead to lower costs. According to Kovalchuk, floating nuclear plants would be a good solution because they can be towed anywhere and due to Russia's experience and expertise in producing

various vessels with nuclear engines including nuclear submarines (see [www.bellona.org](http://www.bellona.org) for information on various fatal Russian nuclear submarines accidents). "Such NPPs would be provided with reactor fuel in strict compliance with the non-proliferation regime. They can be reliably protected and at smaller outlays than we need to ensure the safety of onshore NPPs." He goes on to suggest the idea as a developmental ideology that would lead to technologies created jointly rather than by individual countries - although this one was created by Russia - and calls the "mass production" of reactors an original solution to the non-proliferation issue.

**Sources:** *Sunday Herald*, July 9 2006; "Russia's energy security proposals for the international community" by Mikhail Kovalchuk, July 6 2006

(<http://en.g8russia.ru/agenda/nrgsafety/opinion/2-print.html>); Reclaim the Commons alert, March 17 2006 (<http://www.reclaimthecommons.net/article.php?id=304>); Sapa-AFP, March 16 2006

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# Russia to build floating nuclear plant

After years of speculation, Russia's nuclear energy company Rosenergoatom has signed a contract with the Svemach military shipyard in Severodvinsk (on the Arctic Sea) to build the world's first floating nuclear power plant at a cost of 270 million Euros (some US\$ 344 million). At 140 metres long and 30 metres wide, the ship will be fitted with two reactors on its keel, which combined will produce 70 megawatts of electricity. This monstrosity is expected to go on line in 2010 and countries including China, India, Indonesia and several Persian Gulf states are reported to have expressed interest.

The concept is that the ship could be anchored along any coastline and electricity would be provided to whichever city upon the attachment of a few cables. To get the ship to its location, tugboats would be required since the 20,000 tonne boat would not have its own engine. The reactors on the ship would be of the KLT-40C variety, which are also used to power Russia's nuclear-powered icebreakers, and these are known to be somewhat accident-prone. The reactors run using fuel rods that consist of 40% Uranium 235, which is weapons-grade uranium that could be used to construct dozens of nuclear warheads thus military personnel would be required to protect the ship.

Accidents on board Russian ships are usually a well-kept secret but information on previous accidents on board nuclear-powered icebreakers have been leaked to the West - on at least two occasions, nuclear meltdowns almost occurred on ships after reactor cooling systems failed. In addition, since the plant will be cooled using seawater, an accident could lead to the contamination of entire maritime regions.

**Spiegel Magazine, June 23 2006**

## Russia's plans for new nuclear build

In a June 9 address to Russia's top nuclear industry officials, Vladimir Putin invited the industry to take on a larger role in meeting the country's energy needs. The Russian president had already instructed his government to draft a program to increase the share of nuclear power in overall electricity production up to 25% from the current level of 16%.

Sergei Kiriyenko, former prime minister and now head of the federal nuclear agency Rosatom declared that two more units a year would be built from 2007 with another four or five units per year in 2009 and 2010. Kiriyenko had previously stated that Russia should build 40 new units.

The units to be built in 2007 will be four VVER-1000 blocks to replace the old Chernobyl design RBMK-1000 reactors at the Leningrad nuclear power plant (LNPP), which are to be decommissioned. The new nuclear station will be known as LNPP-2 and is estimated to cost US\$6 billion. The cost analysis is based on the costs of reactor blocks Rosatom built in China but doubled.

Kiriyenko said that a state ecological impact study would be carried out and public hearings held before any new construction would begin. "If society is against it then we will not build anything." The society referred to being the

residents of the Leningrad region who will be the only ones allowed taking part in any debate since they are the only ones who would be affected in Rosatom's view. Oleg Bodrov of Green World criticised this view pointing out that the risks extend far beyond the region and recalled recent nuclear projects implemented in Sosnovy Bor - where LNPP is located - without state environmental assessment or public hearings. Since Sosnovy Bor is just 80 kilometres from St Petersburg, Russian law actually stipulates that its residents should also be allowed to take part in the public hearings on new construction but it is not thought that Rosatom will choose to recognise their legal rights.

Ordinarily, neighbouring countries would also have the right to be consulted on such projects but Russia has not ratified the 1997 Convention of the European Economic Commission of the United Nations on evaluating trans-border impacts on the environment. The convention obliges states to consult each other on large-scale plans that could have trans-border environmental impacts, as is the case with nuclear installations.

**Bellona, June 10 & May 22 2006**

# NRC GRANTS LICENSE FOR NATIONAL ENRICHMENT FACILITY

**The U.S. Nuclear Regulatory Commission (NRC) recently issued a combined license that would allow both the construction and operation of the National Enrichment Facility (NEF) to be located near Eunice, New Mexico.**

**(648.5759) CCNS** - Louisiana Energy Services (LES), a subsidiary of Urenco (a Dutch government consortium), British Nuclear Fuels Ltd., several German utilities and two United States energy companies, will run and operate the facility. It is the first license issued for a major commercial nuclear facility in 30 years. Construction of the US\$1.5 billion facility could begin as early as August.

NEF will produce low-enriched uranium using a gas centrifuge system and will generate both enriched uranium and chemically contaminated depleted uranium waste. The depleted uranium must remain on site until the NRC decides on a disposal policy. The facility will generate a far greater quantity of waste than enriched uranium - approximately 4,800 tons per year.

LES has not yet provided a concrete disposal plan for the waste, or a projected cost for its disposal. LES President Jim Ferland said that he believes shallow disposal will be sufficient, however, the waste is not typical low-level waste. It is both radiologically and chemically hazardous because of the hydrogen fluoride used to make the compound necessary for

the gas centrifuge enrichment process. This chemical is extremely hazardous when in gaseous state and while it will be returned to solid state before storage, the waste must be protected from heat, such as fire or possibly the New Mexico desert.

D.C. based Public Citizen and the Nuclear Information and Resource Service (NIRS) were parties to the hearing and it is due to the efforts of these groups that the NRC is currently conducting a review of depleted uranium disposal in order to create a policy for it. The NRC failed to establish the necessary form of disposal prior to awarding the operating permit to LES.

Michael Mariotte of NIRS said, "It took 17 years and attempts in three states for LES to obtain this license. But if the plant is built, New Mexicans will be paying--with their health and with their dollars [for] the consequences of LES' waste for far, far longer than that."

Both critics and supporters of NEF believe that this facility is a stepping-stone in the resurgence of nuclear power in the United States. In addition to enrichment, both a resumption of uranium mining and the construction of

a nuclear power plant have been proposed for New Mexico. Senator Pete Domenici said, "Gaining this license is important, not only for construction, but for what this facility will mean for the renaissance of nuclear energy in this country."

Those opposed to a renaissance of nuclear energy are concerned about the environmental effects of such activities. Of particular concern is the threat to New Mexico's dwindling water supplies. Joni Arends, of Concerned Citizens for Nuclear Safety, said, "Courting these industries, especially in a region that does not have the resources to support them, is irresponsible. All three activities, mining, centrifuge gas enrichment and nuclear power generation, use and contaminate large amounts of water. We must protect what we have."

**Source:** CCNS News Update, June 30 2006; AP, June 24 2006

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## Senators warn Bush over Russian enrichment

In a July 11 letter to George W Bush, Senators Pete Domenici (Republican-New Mexico), Jeff Bingaman (Democrat-New Mexico), and Mike DeWine and George Voinovich, both Ohio Republicans, warned that allowing more Russian enrichment services to be sold in the U.S. could "have a chilling effect on the massive investments" that USEC and Urenco need to build centrifuge enrichment plants in Ohio and New Mexico.

The Senators stated opposition to any changes to the current uranium antidumping suspension agreement between the Department of Commerce and Russia and also to changes in the US-Russia high-enriched uranium

agreement if the revisions would allow Russia to sell enrichment services directly in the US. As a result of the HEU agreement, Russia now supplies over 40% of US utility requirements for enrichment services.

A June 30 letter to Bush from 17 nuclear generating companies had argued that increased Russian supplies of enrichment services were needed to ensure that new plants are built in the US and elsewhere.

**Platts Nuclear News Flashes, July 12 2006**

# Q&A - MYTHS AND MISUNDERSTANDINGS ABOUT NUCLEAR ENERGY

This Q&A was conceived as a campaign tool for use in the 1 Million against Nuclear Power campaign but can also be used for general work and information. For more information on the petition campaign visit <http://www.million-against-nuclear.net>

## 1 **"Nuclear energy is experiencing a comeback"**

There is a lot of political talk about nuclear being the solution to all our energy problems but in practice not much has happened. In 1989 there were 172 operating nuclear reactors in Europe. There are now 147 - 15% less. Since the Chernobyl disaster in 1986 only one construction process for a nuclear power plant has started in Europe: the prototype EPR reactor in Olkiluoto, Finland. Due to technical difficulties it is already 9 months behind schedule, barely a year since work began and is now expected to be delayed for a further year due to complications with planning. Other plans (France, UK, Baltic countries) are still only at the political stage.

## 2 **"We need nuclear energy because we will not have enough energy in the future"**

Nuclear power plants only produce electricity. The present share of nuclear energy in the total global energy consumption is just 2,7%. The number of nuclear power plants worldwide is 442. At the same time there is a huge unused potential of energy saving, energy efficiency and renewable energy, which in combination are much cheaper and definitely much safer than building new nuclear power plants.

## 3 **"Nuclear energy is an infinite source"**

Nuclear energy makes us dependent on uranium, which is a limited resource. If we would maintain the nuclear energy production at the current level, we would have dug up all (currently and expected) accessible uranium in 50 years. There is more uranium on the planet, but it is either very difficult and/or expensive to mine, or not suitable for use in electricity

production. The associated energy use and CO<sub>2</sub> emissions would rise steeply.

Originally, nuclear energy was supposed to have a closed energy production cycle, using fast breeder technology. This technology failed however and the big European fast breeders are closed down (the 'Superphenix' in France) or were never completed (Kalkar in Germany).

## 4 **"There are new solutions for dealing with radioactive waste"**

The suggested solutions have been at a 'very promising research' stage for decades. One suggestion ('transmutation') entails separating the radioactive isotopes from the waste and reworking these separated parts into something less dangerous - that is dangerous for a shorter time span. It is still not possible to isolate isotopes and moreover, even if it would ever work, it is not suitable for the present generation of waste. It would need special, new-to-build reactor types. In other words, the high-level radioactive waste that is produced today will be with us for around 240.000 years. No final storage has been developed in any country so far; often the waste is stored near the reactor or in temporary bunkers. Experiments with the storage of low-level radioactive waste in earth layers have not proven to be safe so far.

## 5 **"Nuclear energy is cheap"**

Nuclear energy is cheap for the individual consumer but costs are paid through the tax bill. The costs for decommissioning are high, and although some reactors have a fund for this, experience so far has shown that these are by far not sufficient. The cost for safeguarding radioactive waste for hundreds of thousands of years cannot

even be calculated. Moreover, nuclear energy receives a lot of subsidies in many different ways. There is a lot of public money going to nuclear research, safety investments, and into cheap loans for the nuclear industry. It is very difficult to find private investors in the liberalized energy market that are willing to provide the huge amounts of money necessary for building a new nuclear power plant. Therefore public financial participation is considered essential, e.g. in the form of guarantees. In that way investment risks befall society, whereas profits go to the privatized sector. Of the total annual energy subsidies in the EU between 1990 and 1995, 23% went to nuclear energy and only 7% to renewable energy sources.

## 6 **"We need nuclear energy to combat climate change"**

During the complex production cycle of nuclear energy production (uranium mining, enrichment, production, reprocessing, decommissioning, waste storage) a lot of energy is required and used - energy that mostly comes in the form of fossil energy. Nuclear energy is a very energy-intensive way of producing electricity. For the common energy production of 1 kWh of electricity and 2 kWh of heat, the amount of greenhouse gasses emitted during the nuclear (+ oil-fired for heat) variant of this complex production process is nearly as much as that of energy production by a co-generation gas-powered plant. If we were to replace older fossil-fuel burning power stations with new cogeneration systems, for the same amount of electricity and heat generation the total greenhouse gas emissions would be similar to those in a system based on electricity from nuclear power and heating from fossil fuels. Full commitment to energy saving, energy efficiency and renewable energies are

faster and cheaper ways to combat climate change.  
See WISE/NIRS Nuclear Monitor #621-622, "A back-door comeback - nuclear energy as a solution for climate change?" at [http://www10.antenna.nl/wise/621-22/621-22\\_en.pdf](http://www10.antenna.nl/wise/621-22/621-22_en.pdf) for more background.

## **7 "The consequences of the Chernobyl accident are exaggerated"**

It is impossible to calculate the number of victims of the largest nuclear disaster because illnesses such as cancer can occur decennia after exposure to radiation and can have multiple causes. The estimates differ from 40 (the direct victims at the explosion) to 100.000 deaths. Last year the IAEA (International Atomic Energy Agency, a UN agency for the promotion of nuclear energy) published a report that suggested the number of victims did not exceed 4000. This report has now been corrected by its co-publisher WHO (World Health Organization) that found another 5000 victims 'overlooked' in the original report. There are also recent reports, one from Greenpeace counting 93.000 victims and one of European Greens (TORCH: The Other Report on Chernobyl) counting 30.000 to 60.000 cancer victims. The differences are all within the range of scientific uncertainty about how much radiation was emitted at the explosion and how much radiation is fatal.

There is also much suffering and damage to health caused by the economic disruption of the accident. There are also those who have survived surgery and live under heavy medication regimes but who are not counted in these reports.

## **8 "Chernobyl' cannot happen again. Nuclear power stations are much safer nowadays"**

All nuclear power stations in Europe are based on technologies from the 1960s and 1970s. Since the Chernobyl accident huge sums of money have been spent on improving their safety. Nevertheless, there have been 22 major accidents since 1986 and many smaller

ones. For example, in 2005 twenty metric tons of uranium and 160 kilograms of plutonium dissolved in 83,000 litres of nitric acid leaked undetected over several months from a cracked pipe into a stainless steel sump chamber inside the THORP nuclear fuel reprocessing plant in the UK. The partially processed spent fuel was drained into holding tanks outside the plant. In another case, in 2002, there was a near-disaster in the Davis-Besse reactor in the United States, where the steel reactor head was found punctuated and only a few inches away from meltdown. A major accident could still occur any day.

## **9 "We need nuclear energy because there is a growing energy demand, notably from India and China"**

China has announced that it wants to build 30 new reactors. The country has been forecasting the construction of numerous nuclear power plants over the last 25 years but so far, it has only built eleven, from which three are very small. In India, the amount of electricity produced by its 14 nuclear power plants is still smaller than that from its wind power installations. India's announced nuclear expansion has mainly been for military purposes.

Both India and China have huge untapped potential for renewable energy from wind, sun and small hydropower - much more suitable means of providing electricity for poor rural populations than expensive, large-scale nuclear power.

## **10 "Maybe we should not build new nuclear power plants but it is not a problem to leave the old ones open"**

Lifetime extension for ageing nuclear power plants is the trend in the Western world. It is supported by politicians who hope to fulfill Kyoto Treaty obligations in this way and/or try to avoid difficult decisions on reliable and sustainable energy supplies for the future. It is a very risky development because old reactors suffer from problems such as corrosion and erosion and although regular safety checkups are carried out, there have

been many near-accidents and emergency shut downs at old power plants over the last years.

## **11 "A good control on the Non-Proliferation Treaty (NPT) will prevent the spread of nuclear weapons through nuclear energy"**

The part of the NPT stating that all nuclear weapon states should work on abolition, seems to have been conveniently forgotten by the 'established' nuclear weapons states of France, the United Kingdom, Russia, China and the United States. At present, the United States are undermining the NPT by promising nuclear technology to India to develop its 'peaceful' nuclear program, although India has already tested nuclear weapons and gained its nuclear technology illegally anyway. At the same time, technology for the enrichment of uranium is denied to Iran because it is thought that the Islamic state would use it for nuclear weapons. This proves that nuclear energy and nuclear weapons cannot be separated. It is the same technology that produces both, the same material that is used, and the same scientists that are working on it. Over and over again, nuclear knowledge and materials are leaked to non-nuclear states and the IAEA has so far found no way to prevent it. If we want to get rid of nuclear weapons, we must stop producing nuclear energy.



# ARMENIAN GREENS WARN AGAINST URANIUM MINING

**The Greens Union of Armenia has expressed deep concerns regarding Global Gold Corporation's plan to mine uranium, copper and other metals at Nor Getik, 18 kilometres away from Lake Sevan, a freshwater lake 2000 metres above sea level.**

**(648.5760) The Greens Union of Armenia** - Lake Sevan is a huge mountain lake that covers five percent of Armenia's surface area and is a source of water for irrigation, hydropower, recreation, fish, migratory bird habitat and nursery zones for aquatic and amphibian species.

The plan would see the transport of the raw material to the City of Hrazdan for the extraction of the uranium and other metals. Among the consequences of the proposed plan would be that Yerevan City, Armenia's capital located in the shadow of the historical mount Ararat, will be squeezed between two threats of possible environmental catastrophes - from the west there is the Medzamor Armenian Nuclear Power Plant (ANPP) with its storage of radioactive waste and from the north-east, Hrazdan City with its storage of the uranium processing waste - although classified as 'low level radioactive' waste, it nevertheless represents a grave environmental health hazard.

The processing of uranium in particular will produce radioactive dust and wastewater; the latter will be dumped into the River Hrazdan, which provides large amounts of irrigation water. Thus, through dust and water, the fields and inhabited lands along the River Hrazdan will become contaminated with radioactive elements. In addition during natural disasters such as earthquakes, landslides and floods, which occur frequently in this region, the waste materials stored at both Hrazdan and at ANPP present a significant threat to the survival of the people of Armenia, and also may become targets of terrorist attacks.

The mining of uranium will begin its destruction at Nor Getik near a paradise, where many refugees from

Azerbaijan have found shelter. The River Getik flows into the River Aghestev, which means that all the contaminants will also flow into the River Aghestev, which passes through the centre of the town of Ijevan. Villages in the valley of the River Getik would need to be abandoned if radioactive dust were to contaminate the air or should the irrigation water become radioactive.

The contamination of the River Hrazdan would then follow and with it, the destruction of the town of Hrazdan, a resort town where many sanatoriums and health spas, children's homes are located. The Soviets paid special attention to this area allocating funding to limit industrial pollution in Hrazdan. The River Hrazdan flows out of Lake Sevan, then passes through towns, such as Hrazdan, Charentsavan, Abovian, Yerevan, Masis, Ararat, through many villages, and finally flows into the River Arax. The water from the Hrazdan River feeds the irrigation networks of the Ararat valley and all the lands along the river. Thus, contamination of the water of Hrazdan River is unacceptable.

Before the raw material reaches Hrazdan city via rail transport, it would be stored in a storage area, right on the shore of Lake Sevan, because the rail line runs along the shoreline, just like the main road. This means that even if the raw material is transported via trucks, and not stored on the shore, the trucks still have to drive on a road running along the shore. This represents a direct contamination threat to the water of Lake Sevan should a rail or a truck accident occur.

The Government of Armenia must not only adopt public transparency and accounting regarding the activities of various mining companies in Armenia, but also a mechanism, by which the

Armenian public can participate in the decision-making process regarding the ownership and the exploitation of Armenia's natural resources. At the moment, our government seems to be buckling under great external pressures, however, if the public at large is allowed to be informed and to participate in important decisions (for example, regarding the issue of ownership of strategic objects, such as Armenia's hydropower stations), then the general will of the public will resist these external pressures and save our nation's treasures (i.e., water and land) from usurpation and excessive exploitation. Also, without any doubt, if given a choice, the public will chose development of alternative sources of energy, such as wind, hydropower and solar (all of which are abundant in Armenia), instead of promoting the interests of the nuclear industry by proposing a new expensive nuclear power plant for a small earthquake-prone impoverished country.

Uranium mining will produce large amounts of radioactively contaminated scrap, which will have to be disposed of in a safe manner. Uranium mill tailings are normally disposed of (dumped) as sludge in special ponds or piles where they are abandoned. The amount of sludge produced is nearly the same as that of the ore milled. At a grade of 0.1% uranium, 99.9% of the material is left over as scrap/tailing.

Apart from the portion of the uranium removed, the sludge contains all the constituents of the ore. Because long lived decay products such as thorium-230 and radium-226 are not removed, the sludge contains 85% of the initial radioactivity of the ore. Due to technical limitations, all of the uranium present in the ore cannot be extracted. Therefore, the sludge also contains 5% to 10% of the uranium initially present in the ore.

In addition, the sludge contains heavy metals and other contaminants such as arsenic, as well as chemical reagents used during the milling process. Moreover, the constituents inside the tailings pile are in a geochemical disequilibrium that results in various reactions causing additional hazards to the environment. For example, in dry areas, salts containing contaminants can migrate to the surface of the pile,

where they are subject to erosion. If the ore contains the mineral pyrite ( $\text{FeS}_2$ ), then sulphuric acid forms inside the deposit when accessed by precipitation and oxygen. This acid causes a continuous automatic leaching of contaminants. After hundreds of thousands of years, the radioactivity of the tailings and thus its radon emanation will have decreased so that it is only limited by the residual uranium

contents.

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## IN BRIEF

**More delays for FIN-5.** Finnish power company TVO said that the completion of the country's fifth nuclear power reactor - and the world's first EPR reactor - will be further delayed by a year due to planning complications. The 1,600-megawatt reactor is now not expected to be in operation until the second quarter of 2010. The project had already been delayed for several months when construction had to be stopped because of faulty concrete. TVO project manager Martin Landtman said that the Franco-German supplier, Areva-Siemens would not be able to complete on schedule due to the scale of the project. "The individual designs and plans have taken longer than earlier expected," said Landtman, adding, "The timetable has also been affected by the fact that such a sizable and demanding project has not been carried out for many years. Finland's nuclear regulatory authority STUK has criticised the management of the EPR project. Areva shares on the Paris stock exchange fell by 7.71% upon the news that more funds would be set aside to cover costs of the delays.

**Platts Nuclear News Flashes, July 13 2006; AP, July 11 2006**

**Activists arrested in Russia.** Thirteen environmentalists were arrested after staging an anti-nuclear protest in St Petersburg where the G8 Summit will be held. Protest organisers Bellona, a Norwegian environmental group, said that activists were roughed up by Russian police at the rally held to protest against the storage of nuclear waste in Russia.

**AFP, July 11 2006**

**U.S. to offer Russia sweetener on Iran.** Breaking with decades of tradition, the United States is to negotiate a civil nuclear deal with Russia to 'encourage' Moscow to support its efforts to get sanctions imposed on Iran over its alleged nuclear weapons ambitions. The deal, still in its infancy, could lead to Russia earning billions of dollars storing irradiated nuclear fuel from US reactors.

**The Independent, July 10 2006**

**Bishops declare Trident evil.** Nineteen bishops have written to Tony Blair warning him against replacing Britain's nuclear weapons describing them as "evil" and "profoundly anti-God". As a devout Christian, it is hoped that the intervention of the religious leaders will have some affect. The letter says: "Trident and other nuclear arsenals threaten long-term and fatal damage to the global environment and its people." The bishops suggest that the vast sums that would be required to replace the weapons would be better spent fulfilling commitments made to ending poverty at last G8 Summit in 2005 and on addressing pressing environmental concerns.

**The Independent, July 10 2006**

**Climate impact on Swedish NPP.** The management of Sweden's Ringhals-4 revealed that it was forced to decrease power by 50% when saltwater used for cooling reached almost 25 degrees C (77 degrees F), the upper limit for cooling water temperature on July 8. By reducing power, it hoped to help reduce the seawater temperature since water being returned to the sea would be cooler. Sweden has been experiencing a heat wave and ocean water temperatures have been rising rapidly.

**Platts Nuclear News Flashes, July 10 2006**

**Earthlife granted right to appeal.** The Supreme Court of Appeal (SCA) has granted Earthlife Africa Cape Town (ELA CT) leave to appeal the earlier judgement of Acting Judge of the High Court, Judge Fevrier, in the Eskom Board Minutes Court Case. The SCA also set aside the costs order in the leave to appeal application. ELA CT has commended the SCA for recognizing the validity of its application and for ensuring that the law is applied equitably. In 2005 ELA CT launched an application for access to Eskom Board Minutes pertaining to the Pebble Bed Modular Reactor (PBMR) in the hope that these documents would provide Eskom's rationale for failing to supply adequate information on the health impacts and economics of the PBMR.

**EU enrichment deal.** Urenco and Areva have signed an agreement to establish the uranium enrichment centrifuge technology joint venture, Enrichment Technology Co (ETC). Areva bought a 50% stake in ETC, which comprises all Urenco's centrifuge research and development, enrichment installations, design and manufacturing activities for 500 million Euros (around US\$ 635 million). An initial agreement signed in 2002 needed approval from the three governments owning Urenco (UK, Germany & Netherlands) as well as being subject to competition clearance from the European Commission.

**WNA Weekly Digest, July 7 2006 & News Briefing 06.27, July 5-11 2006**

**Chernobyl thyroid cancer link.** A new U.S. study has confirmed a substantially increased risk of thyroid cancer among people exposed to radiation during childhood and adolescence following the Chernobyl nuclear accident. The study is the first to measure the risk of thyroid cancer associated with specific radiation dosage. A total of 13,127 of the 32,385 individuals living in the most contaminated area of the Ukraine during the meltdown and who were under 18 at the time were screened between 1998 and 2000. The Columbia University (New York) doctors, led by Dr. Geoffrey R. Howe, found that 45 cases of thyroid cancer occurred compared with 11.2 cases that would have been expected in the absence of radiation exposure.

**Reuters, July 7 2006**

**Pakistan seeks foreign nuclear investment.** In an apparent bid to get its own civil nuclear deal from the U.S., Pakistan has announced that it is ready to allow foreign companies to invest in its nuclear power plants with the option to take back spent fuel to allay proliferation concerns. Pakistan's Foreign Minister Khurshid M. Kasuri said that there was "no case for not giving [this] nuclear technology to Pakistan", that "no harm" would be done to global counter proliferation efforts and that he would press Islamabad's case on international visits. The minister rejected reports of cooler Pak-US relations following U.S. Secretary of State Condoleezza Rice's comments that President Musharraf needed to increase efforts against al-Qaeda and the Taliban and urges to hold "free and fair elections", instead claiming that the Bush administration had highly praised its counter-terrorism efforts on the Afghan border.

**The Indian Express, July 5 2006**

**UK govt inspectors dismiss reactor crack reports.** Correspondence between reactor operator British Energy (BE) and the Nuclear Safety Directorate (NSD) have revealed structural damage to nuclear reactors in the UK. The documents passed to Greenpeace UK, and analysed by independent nuclear engineer John Large, show that the bricks making up the reactor cores of the UK's 14 advanced gas-cooled reactors (AGR) are cracked although they continue to operate. In a severe event the cracked graphite bricks could cause safety mechanisms to fail, potentially resulting in a nuclear accident. A report by NSD on the Hinkley Point AGR NPP concluded that there is "an increased likelihood of increased risk should we agree to continued operation." The government's nuclear inspectors have since played down the reports claiming that "matter has moved on" and that they are confident of safety.

**The Guardian & Greenpeace UK press release, July 5 2006**

**Thirteen in Cernavoda bid.** Romania will allow thirteen bids to be submitted for the construction and operation of the third and fourth nuclear reactors planned for the Cernavoda nuclear power plant. The country currently operates one Candu reactor at the site and plans to launch a second - funded with a 2004 Euratom loan - next year. The Ministry of Economy said that offers from Romanian firms TESS Conex-ASAM-Iasi, Electrica Bucuresti, Alro Slatina, AES (U.S.), Enel (Italy), Iberdrola (Spain), Gabriel Resources (Canada), Electrabel (Belgium), Germany's RWE and E.ON, Korea Hydro & Nuclear Power, Ansaldo with AECL (Italy and Canada), and Unit Investments with Dogan Enerji (Luxembourg and Turkey) are expected by July 30. Works on Cernavoda began some 30 years ago but were abandoned in 1990 when a survey revealed equipment in poor condition and faulty welding.

**Reuters, June 29 2006**

**Indonesia nuclear tender set for 2007.** Indonesia's Energy and Mineral Resources Minister Purnomo Yusgiantoro announced that the government is to hold a tender to select contractors for the construction of the country's first nuclear power plant next year. In accordance with the country's energy policy, the reactor is expected to be sited at Gunung Muria - at the base of a dormant volcano in a highly seismic area and near four of Indonesia's most important sites of Islamic pilgrimage - and should go online between 2015 and 2016. Purnomo said that foreign investors were most likely to be interested in the project, which would be coordinated by the National Nuclear Power Agency's Nuclear Energy and Development Centre. Past efforts by former president Soeharto to bring nuclear power to the country were abandoned following strong public and NGO resistance.

**The Jakarta Post, June 29 2006; Greenpeace UK email, June 30 2006**

**Russia test-fires ballistic missile.** The ballistic missile was fired from a submarine in the Barents Sea and landed on the

Kura test range in the Kamchatka peninsula some 3,000 miles away in the country's far east. Russian Navy spokesman said that the test demonstrated the "high readiness of the Navy Strategic Nuclear Forces".

**Associated Press, June 30 2006**

**Free treatment for nuke test survivors.** The remaining survivors of British nuclear tests carried out in Australia between 1952 and 1963 will now be eligible for free cancer treatment. The new federal government policy follows the release of a seven-year study into the link between the nuclear tests and incidents of cancer in test participants. Although the study found that cancer rates among the group was higher than that of the general population, it concluded that there was no connection between exposure to radiation and the participants increased cancer rates. Some 16,000 Australians took part in the tests at Emu Field and Maralinga in South Australia and at the Monte Bello Islands off the coast of Western Australia. More than 11,000 participated in the health study, which began in 1999, and half have since died.

**Yahoo! Australia, June 28 2006**

**Japanese worker irradiated.** A worker at the Rokkasho nuclear fuel reprocessing plant was exposed to a 'small' amount of radiation but has apparently suffered no health problems as a result. An official of the Aomori prefecture government said that a doctor had examined the man and that there had been no effect either the man or on the surrounding environment.

**Reuters, June 26 2006**

**Uranium refinery for Saskatchewan.** Lorne Calvert, Saskatchewan Premier, has visited Paris to persuade the state-owned Areva group to build a uranium refinery and conversion facility in his province. Areva already has stakes in two uranium mines in the province, which is a major source of uranium although processing is currently done elsewhere. The province will lower its corporate income taxes and phase out a tax on capital to encourage the French nuclear giant. In addition, Calvert will also meet with Cameco Corp. of Saskatoon, the owner of the third major uranium mine in Saskatchewan, which also operated a uranium refinery and conversion facility in Chalk River Ontario. According to Calvert, "several communities in Saskatchewan are clamouring to have a uranium refinery built in their area".

**Globe and Mail, June 23 2006**

**Swedish opposition would stop decommissioning.** Should Sweden's four main opposition parties win the September election, they would halt nuclear decommissioning although they would not support the construction of new nuclear plants now. According to a joint statement released on June 14, the opposition would review the issue of new build toward the end of its four-year term if elected. The minority Social Democratic government remains committed to phasing out nuclear and have already shut down two Barsebaeck reactors.

**Platts Nuclear News Flashes, June 14 2006**

**Spain could extend plant lifetimes.** After pledging to shut down Spain's nuclear power plants in its manifesto, the socialist government of Jose Luis Zapatero now says that it will only be able to stick to that "if circumstances allowed and taking into account our energy supply needs". Environment Secretary Soraya Rodriguez told Reuters that the government had not drawn up a timetable for the closure of the country's eight nuclear reactors and had not yet decided whether they could be closed down as yet - no decision will be made before the next general election, due by March 2008. Industry minister Jose Montilla admitted that the government would now consider lifetime extension for some existing units depending on safety assessments by the Nuclear Safety Council. However, the government said that the party's anti nuclear policy had not changed and Montilla insisted that there could be no new nuclear build in Spain due to social opposition and costs.

**Reuters, June 1 2006; Platts Nuclear News Flashes, May 31 2006**

**Russia takes back nuclear fuel.** On May 30, Russia announced that it would repatriate spent nuclear fuel from reactors set up by the former Soviet Union in seventeen countries by 2013 as part of the Global Threat Reduction Initiative (GTRI). The countries involved host 20 Soviet-era reactors in total and have agreed to participate in the initiative, which will cost around US\$ 150-200 million. GTRI was launched by the U.S. in 2004 and aims to identify, secure and remove U.S. and Russian nuclear materials located in other countries around the world to avoid them falling into the hands of terrorists. Russia carried out its first repatriation operation in April, removing 63 kilograms of uranium - enough for two and a half nuclear bombs - from a reactor near the Uzbek capital of Tashkent and just 37 kilometres from the border with Afghanistan.

**MosNews, May 30 2006**

**U.S. HEU leak.** Some 35 litres of high-enriched uranium solution leaked into a glove box and onto the floor at a U.S. facility in March according to an NRC Event Rating Form filed to the IAEA's INES (International Nuclear Event Scale) information system. The facility was not identified. NRC's Cynthia Jones, who filed the report, said there were no injuries or casualties but that a criticality accident could have occurred under the conditions at the facility. If there had been an accident, it would likely have delivered an exposure to "at least one worker... high enough to cause acute health effects or death," she said. According to the report, the operator stopped all HEU processing in the area. The event was provisionally rated at Level 2

(incident) on the seven-level INES. The report is posted on the IAEA web site at <http://www-news.iaea.org/news/>.

#### **Platts Nuclear News Flashes, May 10 2006**

**Chinese reactor connected to grid.** Built by Russia's Atomstroyexport on a turnkey basis, the Tianwan-1 VVER-1000 was connected to the Chinese grid on May 12.

The unit will operate at 30% nominal power for testing purposes until the end of the year. The Tianwan project comprises of two modern VVER-1000s located in China's Jiangsu province. It was the first nuclear power plant export order for the Russian industry in a decade and the first one implemented during the "transition to market conditions." The plant was built under a 1992 bilateral cooperation agreement. Atomstroyexport said that hot testing had begun at Tianwan-2, in preparation for fuel loading at that unit. Both units have been significantly delayed due to equipment and licensing difficulties.

#### **Platts Nuclear News Flashes, May 12 2006**

**U.S. EPR to be developed.** Constellation Energy and Areva have signed a memorandum of understanding for a joint project to develop a U.S. EPR reactor. The two companies say they will finalise the technical assistance agreement expected to include an "exchange of engineers, documentation and assistance services" needed to advance the deployment of Areva's 1,600-MW PWR, the US Evolutionary Power Reactor. UniStar Nuclear aims to build and operate a fleet of EPRs under turnkey contracts and is working with Bechtel Power Corp. as the architect-engineer and constructor; Electricite de France will help to promote the EPR "as the technology of choice for nuclear fleets around the world". Areva is working to convert the European design to meet U.S. standards and plans to submit a design certification application for the EPR to the NRC next year.

#### **Platts Nuclear News Flashes, June 1 2006**

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## WISE/NIRS NUCLEAR MONITOR

The Nuclear Information & Resource Service was founded in 1978 and is based in Washington, US. The World Information Service on Energy was set up in the same year and houses in Amsterdam, Netherlands. NIRS and WISE Amsterdam joined forces in 2000, creating a worldwide network of information and resource centers for citizens and environmental organizations concerned about nuclear power, radioactive waste, radiation, and sustainable energy issues.

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