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THE END FOR RUSSIAN "NUCLEAR RENAISSANCE"?

According to the Russian government, the number of new nuclear reactors planned to be built by 2015 will be cut by 60%. But even that number of nuclear units will be hard to build. As environmental groups has been saying for years, Russian nuclear development program is far from reality.

(707.6033) WISE Russia - Two years after the Russian government approved an ambitious program of building nearly 40 nuclear reactors, mass-media in Moscow are reporting about massive cuts in number of power plants to be built until 2015. According to a leading business newspaper "Vedomosti", referring to the data of the Ministry of energy, the number of new nuclear reactors will be cut by over 60%.

Russia may save about US$25 billion (18 billion euro) if it never builds the units removed from the 2015-target list, Russian environmental group Ecodefense estimates. Moreover, spending this amount for construction of natural gas power plants may bring 3 times more electricity, compared to nuclear, said Vladimir Milov, former deputy energy minister of Russia, to the Nuclear Monitor.

According to the scheme of locations for energy facilities until 2020 (the state program outlining the plan for construction of nuclear, coal, gas, hydro plants during next decade), "Rosatom" planned to put online 13,2 GWt of new nuclear capacity until 2015. This is equal to 13 units of the VVER-1000 design or 11 units of the VVER-1200 design. Under the reduced plan, only 5,2 GWt of new nuclear capacity is planned to be added. But even that reduced number of reactors will be hard to build, environmental campaigners say.

The scheme of locations for energy facilities until 2020 was approved by the Russian government in 2008. Environmental groups organized protests on the day of approval in more than 20 cities, because the plan includes an increased number of nuclear and coal plants which will increase the risks for public health and environment. Campaigners also protested because government excluded environmental groups from the decision-making process, what resulted in an anti-environmental and poor-quality document.

Reducing the number of nuclear reactors to be built in next 5 years is good news but is actually just a reflection of reality. When the plans were approved in 2008, it was already clear that Russia can not afford to build dozens of reactors during the next decade. First of all, "Rosatom" doesn't have enough heavy machinery capacity to produce reactors even for domestic plans, and there are also foreign contracts in China, India and Belarus.

And the Russian nuclear industry said it will try to win more contracts in Asia, Latin America and Eastern Europe.

Why did the Russian government approve a program that cannot be implemented? It looks like "Rosatom" just decided that an increasing number of reactors on paper will bring them more

MONITORED THIS ISSUE:

funds from the federal budget. But now plans and funding will be reduced, which will affect both planned and under construction reactors, Vladimir Milov told the Nuclear Monitor.

The Russian "nuclear renaissance" may well be over, even if it did not start yet. And this is good news because reactors are expensive, inefficient and dangerous just as they were 24 years ago when Chernobyl happened.

Currently there are 31 nuclear reactors in operation in Russia producing 16% of all electricity. Several of the oldest and the most dangerous reactors -such as RBMKs and VVER-440- obtained extended licenses when planned operational lifetime was over.

Source and contact: WISE Russia

THE MYTHOLOGY AND MESSY REALITY OF REPROCESSING

It is only recently that reprocessing is being promoted as a “solution” to the problem of mounting quantities of spent fuel. In this context, it is often called “recycling.” It is now explicitly being promoted as a means for greatly increasing the use of the uranium resource contained in the spent fuel. Proponents of nuclear power often state that 95 percent of spent fuel (or used fuel or irradiated fuel) can be “recycled” for recovering the energy in it.

(707.6034) IEER - A new report *('The Mythology and Messy reality of Nuclear Fuel Reprocessing')* by the Institute for Energy and Environmental Research (IEER) looks at France (often called an 'inspirational example for nuclear waste management') and shows that for existing spent fuel the slogan belongs in the same realm of economic claims for nuclear energy that would be “too cheap to meter.”

It is worth noting at the outset that reprocessing and breeder reactors were not proposed as a solution to the problem of nuclear waste, which has so far turned out to be intractable for a host of technical, environmental, and political reasons. Reprocessing was also not proposed as an essential accompaniment to burner reactors, like the light water reactors, to increase the use of the uranium resource because its value in that regard is marginal.

In light water reactor systems, almost all the uranium resource winds up as depleted uranium or in spent fuel. Even with repeated reprocessing and re-enrichment, use of the natural uranium resource cannot be increased to more than one percent in such a system. The use of 90 to 95 percent of the uranium resource in the spent fuel is impossible in a light water reactor system even with reprocessing. These are technical constraints that go with the system.

Reprocessing in France
Reprocessing in France is continuing mainly due to the inertia of primarily-government-owned electricity generation and reprocessing corporations (EDF and AREVA respectively). It continues also due to the political and economic dislocations that closing an established large industrial operation would cause in a largely rural area in Normandy that has scarcely any other industries. After it was clear that the breeder reactor program was not going to fulfill its theoretical promise any time soon, the decision to continue reprocessing in France was not about economics, technical suitability, waste management, or significantly increasing the use of the uranium resource in the fresh fuel.(*1) It was driven mainly by the inertia of a system that was government-owned and had already invested a great deal of money and institutional prestige in the technology.

Light water reactors(*2) and reprocessing
Uranium-238 is almost 99.3 percent of the natural uranium resource. It requires about 7.44 kilograms of natural uranium to produce one kilogram of 4 percent enriched uranium fuel, assuming 0.2 percent U-235 in the tails (depleted uranium).(*3) This means that about 86.6 percent of the natural uranium resource winds up as depleted uranium. Even if the efficiency of enrichment improved so that only 0.1 percent of U-235 remained in the tails, it would still mean that about 84 percent of the natural uranium resource would wind up

Reprocessing in the US?
French company Areva has no immediate plans to build a reprocessing and associated MOX fabrication complex in the US. Areva spokesman Jarret Adams said the company has been discussing designs for a US reprocessing and MOX fuel fabrication complex with utilities for many years and that it is 'starting to educate President Barack Obama’s administration' on Areva’s vision for nuclear fuel recycling in the US. But on March 25, Alan Hanson, Areva’s executive vice president of technology and used fuel management, said in Washington, that preliminary designs show that a reprocessing and associated MOX fuel fabrication complex built at one site in the US would be a US$25 billion capital expenditure. Jacques Besnainou, CEO of Areva North America, said in that Areva would be willing to invest its own money to help develop a reprocessing complex in the US. On March 25, Besnainou said that a US reprocessing complex could be a regional hub capable of reprocessing spent fuel from the Americas and small countries from other regions. “I think we should help the [United Arab Emirates] with their used fuel 20 years from now,” he said.
Nuclear Fuel, 5 April 2010

as depleted uranium when it is first enriched. (For simplicity, the authors ignore losses of uranium during milling and the series of processing steps prior to enrichment. These are small compared to the amount of depleted uranium.)

It should also be noted that the vast majority of the uranium in the fresh fuel is still non-fissile U- 238. In the case of 4 percent enriched uranium, made from natural uranium, the other 96 percent is uranium-238. The fraction of U-238 is a little lower in fuel made from reprocessed and re-enriched uranium due to the buildup of other uranium isotopes, notably U-236. A small fraction (about two percent) of this U-238 gets converted into plutonium.(*4) Some of this is fissioned in the course of reactor operation and therefore provides a portion of the energy output of the reactor. But the vast majority of uranium-238 will remain unused in burner reactors – that is, the type of reactors in use today.

Commercial reprocessing using the PUREX process, the only commercial technology at present, separates the spent fuel into three streams – (i) plutonium, (ii) uranium, and (iii) fission products, plus traces of non-fission radionuclides, like neptunium.

France uses most, but not all (see below), of the separated plutonium as a mixed plutonium dioxide uranium dioxide fuel, called MOX fuel for short. It uses depleted uranium to make MOX fuel. However, of the 6.44 kilograms of depleted uranium created in the process of making fresh fuel from natural uranium, in the used example, just over a tenth of a kilogram is used as a component of MOX fuel; most of that remains unused in spent MOX fuel.

France also uses a part of the uranium recovered from spent fuel as a fuel. But this uranium must be re-enriched to the requisite level. To get the same performance as fresh 4 percent fuel, the reprocessed uranium must (because of the degraded isotopic composition of the uranium) be enriched to about 4.4 percent, which means that about 87 percent of the recovered uranium becomes depleted uranium waste. Further, roughly 93 percent of this re-enriched fuel is also uranium-238. When this recovered and re-enriched uranium is used as fuel only a small amount of it is converted to plutonium, while most remains unused. If repeated reprocessing and re-enrichment are carried out, the pile of depleted uranium mounts rapidly, while the amount of fissile material dwindles. Further, it should be noted that the process of enriching reprocessed uranium also increases the concentration of uranium-236, which is not fissile; this reduces the usefulness of re-enriched uranium as a fuel.

The flow of materials in a light water reactor scheme with reprocessing is shown in diagram in **Figure 2.** It corresponds to the example the authors have been using: an initial fuel loading of 1 kilogram of fresh (4 percent) low-enriched uranium fuel, 0.2 percent U-235 in the depleted uranium tails at the enrichment plant, and 8 percent plutonium in MOX fuel, and assuming that all the recovered uranium is re-enriched.

Only one round of reprocessing and re-enrichment is shown in Figure 2. At the end of the use of the MOX fuel and re-enriched uranium fuel, only about 6 percent of the kilogram of original fresh fuel has been used to generate energy. In turn this is only about 0.8 percent of the 7.44 kilograms natural uranium resource used to make the single kilogram of 4 percent enriched uranium fuels.
Repeated reprocessing, MOX fuel use, and re-enriched reprocessing uranium fuel use does not improve the picture much. This is because most of the

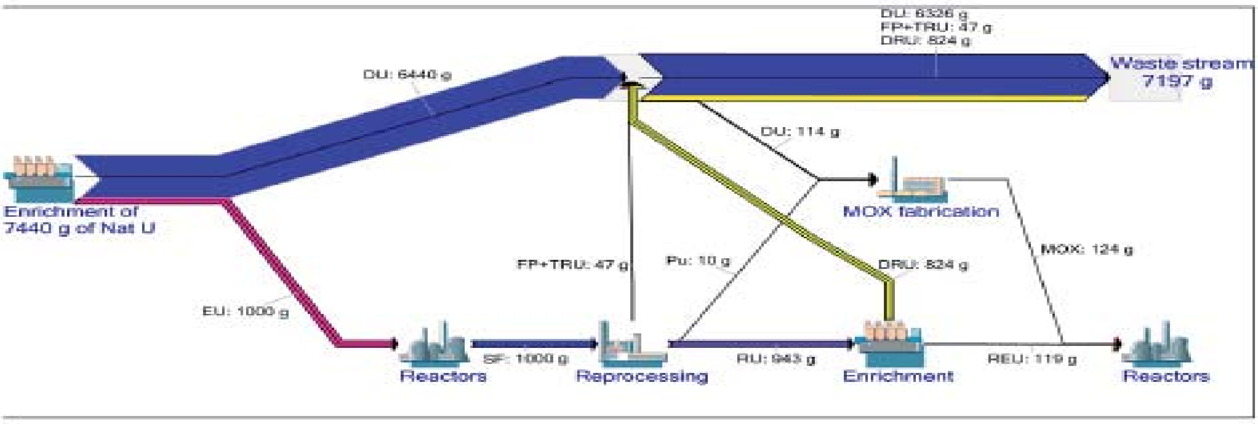

Figure 2: Fuel and Waste Streams in a Light Water Reactor System with Reprocessing and Re-Enrichment for One Kilogram of Fresh Fuel (4% Enriched)
Notes: 1. Nat U = natural uranium; DU = depleted uranium tails (0.2 percent U-235 assumed for this chart); EU = enriched uranium; Pu = plutonium from spent fuel; REU = re-enriched uranium; MOX = mixed plutonium dioxide uranium dioxide fuel; FP = fission products; SF = spent fuel; TRU = transuranic radionuclides other than plutonium isotopes; RU = uranium recovered from spent fuel; DRU = depleted recovered uranium. Pu value rounded up to nearest gram.
2. U-235 in the tails at the enrichment plant = 0.2 percent.
3. The amount of matter converted to energy (according to the famous E = MC2) is very small (much less than one gram per kilogram of fuel) and is ignored in the above diagram

remaining spent fuel is left behind as depleted uranium in each round. In fact after five rounds, about 99 percent of the original uranium resource is depleted uranium. This means that the fraction of the uranium resource that can be used in a light water reactor-reprocessing-re-enrichment scheme is one percent or less. This can be raised slightly by reducing the amount of U-235 in the tails below 0.2 percent.

This is a conservative calculation, done as a simple illustration. It ignores the isotopic degradation of both the uranium and plutonium in the second and subsequent rounds of use in a reactor. Specifically, uranium-236 and uranium-234, which are not fissile isotopes and which degrade fuel performance, build up in the fuel as the reactor operates; uranium-236 increases in concentration with re-enrichment. Small amounts of uranium-232 also build up.(*5) This isotope has a specific activity (defined as disintegrations per second per unit mass) that is 30 million times greater than natural uranium. Unlike fresh uranium fuel, it quickly generates decay products that emit strong gamma radiation, which creates higher worker radiation risks. Fuel quality requirements limit U-232 to a few parts per billion. As a result, re-enrichment becomes more complex and costly for each round of recycled uranium fuel use in a reactor. The fraction of uranium-236 and uranium-232 must be reduced by blending the enrichment feedstock with natural, un-reprocessed uranium or by blending the enriched uranium derived from reprocessed uranium with enriched uranium originating from fresh ore. Similarly, the isotopic composition of MOX fuel degrades with each round of MOX fuel use and reprocessing; this makes reprocessing even more expensive and the fuel less valuable.

As a result of the above considerations, technical and cost considerations limit the practical ability to reprocessing and re-enrich for more than one round past the first use of fresh fuel made from natural uranium.

Even when the initial depleted uranium is left out of the calculation (though it should not be, since it contains most of the natural uranium resource), reprocessing and repeated re-enrichment and MOX fuel use will utilize only about six percent (rounded) of the fuel originally loaded into the reactor, with about two-thirds of that occurring in the initial irradiation and most of the rest occurring in the first round of MOX fuel use. Repeated reprocessing, re-enrichment, and MOX fuel use just does not increase resource use significantly, because most of the uranium becomes part of the depleted uranium stream at each step. Finally, it should be noted that these numbers ignore uranium losses at the uranium mill (where, typically, several percent of the uranium is discarded into tailing ponds along with almost all the radium-226 and thorium-230 in the ore) and in the processing steps needed to make the uranium hexafluoride feed for the enrichment plant. The actual resource utilization based on the uranium content of the ore at the mill is, in practice significantly less than one percent. Fresh fuel plus one cycle of MOX use and re-enrichment uses only about 0.8 percent of the natural uranium resource. This is reduced to about 0.7 percent when the losses of uranium in the processing at the uranium mill and the conversion to uranium hexafluoride are taken into account.

France currently only re-uses a third of the recovered uranium. This means that France uses less than six percent of the uranium resource in the original fresh fuel; about 80 percent of this is used in the first round of fresh fuel use prior to reprocessing. In other words, the expense, risk, and pollution created by French reprocessing only marginally increases the use of the underlying uranium resource. Further, the re-enrichment is not done in France but in Russia. The depleted uranium from re-enrichment, amounting to roughly 87 percent of the reprocessed uranium by weight, remains behind in Russia.

In sum, the French use only about 0.7 percent of the original uranium resource to create fission energy. The rest is mainly in depleted uranium at various locations, or is piling up as reprocessed uranium that is not being used, or is uranium left in spent fuel of various kinds (including MOX spent fuel). This figure cannot be increased significantly even with repeated reprocessing and re-enrichment so long as the fuel is used in a light water reactor system.

Notes (For full references see the original report):
(*1) All calculations are based on four percent enriched fresh fuel made from natural uranium as the starting point, unless otherwise specified. The results would be similar with any starting enrichment for light water reactors, which are designed to use low enriched fuel (generally less than five percent U-235).
(*2) Light water reactors are a specific example of "burner" reactors, which have a net consumption of fissile materials in the course of energy production from fission. Some new fissile material is created, mainly plutonium-239, but the amount of fissile material used (or burned), mainly a combination of uranium-235 and plutonium-239, is greater than the amount of fissile material residing in the irradiated material at the end of the reactor operation period. This discussion is focused on light water reactors (LWRs), and specifically on pressurized water reactors (PWRs), the design used in France. The arguments are essentially the same for boiling water reactors (BWRs). The U.S. commercial nuclear power reactor system consists entirely of PWRs and BWRs. Unless otherwise stated, the examples and figures used in this report are typical of pressurized water reactors. The exact assumptions, such as the enrichment level of the fresh fuel, make no difference to the overall conclusion about the efficiency of resource use in a light-water-reactor system with reprocessing and re-enrichment.
(*3) Used is 4 percent enrichment as a typical figure. Actual enrichments in pressurized water reactors may range from 3 percent to above 4 percent. During enrichment, natural uranium is separated into two streams – the enriched stream, which is then chemically further processed to make reactor fuel, and the depleted stream, which is also called the "tails." These tails, which consist of depleted uranium, have been accumulating at enrichment plants in the United States and elsewhere. The authors assume a U-235 content of about 0.2 percent in the tails (i.e., in the depleted uranium). In practice, the U-235 in the tails varies and a typical range generally considered

is 0.2 to 0.3 percent.
The amount of natural uranium needed to produce a kilogram of fuel will vary according to the enrichment of the fuel used and the percent of U-235 in the tails. The lower the percent of U-235 in the tails, the less natural uranium is needed for a given level of enrichment. Hence the example discussed here is a favorable practical case for maximizing resource use in a light water reactor system.
(*4) The main isotope (over 50 percent) in the separated plutonium is Pu-239, but there are also substantial amounts of higher isotopes, including Pu-240 and Pu-241. The mixture is known as reactor-grade plutonium. Pu-240 is not fissile. When used as part of MOX fuel in light water reactors some of it gets converted into Pu-241, which is fissile. Pu-240 can fission with fast neutrons and generate energy.
(*5) Uranium-233 and -237 are also formed in very small quantities and have very little radiological impact. Uranium-233 is a fissile material which gives a tiny added benefit to the reprocessed uranium. (IAEA-TECDOC-1529 2007 pp. 7-8)

Source: 'The Mythology and Messy reality of Nuclear Fuel reprocessing', Arjun Makhijani, Ph.D., April 8, 2010, available at: http://www.ieer.org/reports/reprocessing2010.pdf
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NUCLEAR BANK? NO THANKS!

On April 18 a global campaign against private banks supporting nuclear energy will be launched with the release of a new report and website dedicated to make campaigning easy. The campaign is carried out by the French section of Friends of the Earth, German Urgewald, Austrian Antiatom Szene, Italian CRBM, WISE, the Banktrack-network and Greenpeace International.

(707.6035) WISE Amsterdam - As the report will be launched at press conferences in three European major cities just the week after the publication of this Nuclear Monitor we cannot publish its findings yet. Just go to www.nuclearbanks.org (not yet online) and check the facts on dozens of banks and their involvement in financing the nuclear disaster.
The campaign activities itself will focus on a handful of so-called ‘dodgy deal’s’, projects which should be stopped immediately. Representatives of ngo’s working in the countries were these projects are build will be speaking at the press conferences and will have talks with representatives of the involved banks, both at public meetings and behind closed doors.

The Angra 3 dodgy deal
One of these dodgy deals is the Brazilian Angra 3 reactor, a typical example of a nuclear ‘hang-over’ project, where construction started decades ago and has never been finished. It is a second generation reactor designed by Siemens in the early 1980s. Work started in 1984 but was suspended two years later. While 70% of the equipment is reportedly on site, full construction never got under way. The government announced in 2006 that it intends to finish construction, and in December 2008 the state-owned utility Electronuclear signed an agreement with the French company AREVA to complete the power plant. Brazil’s nuclear utility Eletronuclear has been looking for 1.35 billion euro (US$1.8 billion) from a private partner to complete the project. After everything, the expected cost-overruns and the expected delays, the completion of Angra 3 would mean nuclear power generates just 6% of Brazil’s electricity.

Facts about nuclear safety, local approvals, institutional frameworks and project economics strongly indicate the application of double standards when compared to what is common and required in European countries.

Nuclear Safety

Basic facts:

- One PWR reactor (1,270 MWe) to be supplied by Areva/Siemens and built for Electronuclear
- Cost officially put at 1.8 billion dollars (ca 1.35 billion EUR)
- Construction to start in 2010 and operational in 2015-2016
- Location 23.00 S and 44.46 W (coastline, 130 km West of Rio de Janeiro and 220 km East of Sao Paulo)

Being based on a 30-year-old design, and with many components already fabricated and stored for decades, Angra 3 is a nuclear power plant that falls far behind current reactor technologies. Upgrades can only partly address these issues and Angra 3 will never reach the same standards as, for example, the French Generation III+ European Pressurized Reactor (EPR).

Illegal and unconstitutional approval
The construction of Angra 3 was originally approved in 1975 by presidential decree number 75870/75. The current government resolved in 2007 to resume construction, based on this 1975 decree. However, this original decree was repealed by a presidential decree in 1991.
More importantly, the recent decision to build the third reactor at Angra and subsequent governmental approvals have been found to be in conflict with

the Brazilian constitution Adopted in 1988, Brazilian federal constitution requires that, in addition to an authorizing act of the executive power, any action to construct nuclear facilities in Brazil must be approved by Congress. The construction of Angra 3 was neither discussed nor voted upon in Brazilian Congress. The government is arguing that the reactor was already approved in 1975 before the constitution was adopted, again ignoring the fact that the 1975 decree was nullified by the decree of 1991.

Weak regulatory environment:
The Brazilian nuclear regulator CNEN is not an independent body, and has many conflicting interests including a direct commercial link to the Angra 3 project. While CNEN, as regulator, has the authority to issue licenses to the operator of Angra 3, one of its branches, INB, is simultaneously providing fuel to power Angra's reactors.

The way in which CNEN is organized also poses a conflict of interest. For example, CNEN's institutions are contracted to analyze the impact of accidents occurring in INB factories. CNEN also operates nuclear installations inside research institutes that it licenses and regulates. Nuclep, a group that manufactures the equipment for the nuclear industry, is also part of the CNEN infrastructure. So, in Brazil, CNEN is an umbrella group with its own supplier, operator, contractor, licensor and regulator.

CNEN has a track record of showing a favorable attitude towards the Angra nuclear power plant. For example, in contradiction with legislation, it has repeatedly extended a provisionary operational license to Angra 2 unit despite the fact that satisfactory evacuation plans are not in place and that the Federal Public Ministry has required improvements to this situation since 2001. Similarly, it allows the operation of two existing units despite the fact that not even an interim repository for its radioactive waste has been licensed.
Since the 70s, some Brazilian organizations have been arguing that the CNEN should become an independent body. The Brazilian Physics Society (SBF) is one of the leading proponents of creating this separation. In 1985, by presidential decree, the Brazilian nuclear program evaluation committee was formed. Members of this committee included scientists, engineers, managers and businessmen, whose remit was to produce recommendations to the public administration for the nuclear industry. Its report included a recommendation to create CNEN as an independent regulatory body, but no action has been taken to resolve the innate conflict of interest. A similar recommendation was made in 2007, but to no avail.

The governance structure of CNEN does not reflect the regulatory independence required by the international convention on nuclear safety (CNS) that was adopted more than 10 years ago by the national congress in Brazil.

Similarly, current EU legislation requires that *"Member States shall ensure that the competent regulatory authority is functionally separate from any other body or organisation concerned with the promotion, or utilisation of nuclear energy, including electricity production, in order to ensure effective independence from undue influence in its regulatory decision making."* (EU Directive 2009/71).

Economic Risks
The projected cost of 1.35 billion euro to build a 1,270 MW reactor seems to be too low. Although it may be argued this is due to some equipment having already been purchased in the 1980s, current reactor projects are nevertheless three to four times more expensive per unit of installed capacity.

Also, securing construction funding in euros increases the financial risk of the project, an aspect that is increasingly challenging to manage in a repayment-of-debt scheme. The Brazilian Real has fluctuated by 37% over a one-year period compared to the euro. This volatility will eventually impact the project's cost.

Large-scale of upgrades and adaptations required to integrate new safety requirements into the existing Angra 3 structure may lead not only to higher construction costs, but also increase the risk of unplanned outages during its operation. For example, the Temelin nuclear power plant in the Czech Republic, which used outdated Russian technologies but was upgraded in the 1990s, struggles to achieve a 70% cumulative capacity factor. The first reactor at Angra also demonstrates this problem. Angra has a cumulative load factor as low as 44%, while Angra 2 manages to reach 78%. Angra 1 and 2 took 13 and 25 years respectively to be completed, and their total expenses have reached US$10 billion US dollars for a combined capacity of 2,000 MWe.

Not a Least-Cost Option for CO2 Emission Reduction
Brazil has great potential for renewable energy sources that can deliver electricity at cheaper rates than new reactors. A peer-reviewed analysis published in the journal Energy Policy in 2009 shows that power generated at Angra 3 will be more expensive than hydro, biomass and wind energies. Its production has been calculated at 113 US dollars per MWh, while co-generation with sugarcane bagasse delivers at US$74 per MWh, natural gas at US$79 per MWh, and hydroelectric at US$46 per MWh. It concludes that even wind at US$107 per MWh can deliver more affordable electricity than Angra 3.

Procel, an energy efficiency program of the Brazilian government, also identified the potential of energy efficiency measures that can save 7,000 MW of energy by investing just US$560 million in related measures.

Lack of Transparency
The Brazilian nuclear program does not appear to make any economic sense or to be driven by energy needs, but instead seems to be driven by geo-political strategic interests. People who were previously involved in a secret program to build nuclear weapons, terminated in 1992, continue to be strongly involved – including the current chair of Electronuclear, operator of the Angra reactors, former Admiral Othon Luiz Pinheiro da Silva. In a December 2006 interview, the former creator and coordinator of the Naval Nuclear Program between 1979 and 2004, claimed that nuclear submarines are critical if Brazil is to be considered a major power. Brazil joined the Non-Proliferation Treaty only in 1994, and to

date has not yet ratified its Additional Protocol to safeguards. On several occasions, it has rejected missions by the International Atomic Energy Agency, for instance regular site visits. This all has implications also on existing lack of transparency and public participation around Angra 3.

The involved banks (check the site, on-line from April 19 on!) know all these facts aswell and are not too eager to step in with loans and guarantees. Therefor they seek public money to back-up the risks involved. Interestingly it is the German government who considers to provide financial backup with a loanguarantee by the German export credits agency Hermes (see also Nuclear Monitor 703, January 29, 2010 for more background on this).
Please help this campaign to be succesfull; put the website www. nuclearbanks.org as a link on yours, join the campaign (see possibilities on the site), contact your bank on their nucear policy and join the international days of actions that will be announced soon!

Source and contact: www. nuclearbanks.org and www.banktrack. org

INTERIM STORAGE OF DU WASTE IN UTAH REMAINS TO RAISE QUESTIONS

While the debate on what to do with Savannah River Site's depleted uranium (DU) waste lingers on, the US Energy Department's Inspector General calls a plan to store two trainloads of this DU waste in Texas unnecessary and wasting taxpayers' money.

(707.6036) Laka Foundation - The radioactive material, left over from decades of nuclear weapons production and contaminated with reactor originated radionuclides, was stored in 15,600 drums and intended for disposal at EnergySolutions Inc.'s facility in Clive, 70 miles (110 km) west of Salt Lake City, Utah. This is a facility for the disposal of low-level radioactive waste or Class A waste. Though the Nuclear Regulatory Commission (NRC) recently decided against reclassifying DU as hotter than Class A waste, after the arrival of the first shipment of 5,408 drums from Savannah River Site (SRS) in December, Utah's governor protested further shipments. The Department of Energy (DOE) then idled two trainloads that remain at the nuclear weapons facility in South Carolina.

It wasn't immediately clear if the radioactive waste would remain in South Carolina or be disposed of elsewhere. In a November presentation given to the SRS Citizens Advisory Board, the DOE said if shipments to Utah were interrupted, the waste would be diverted to the Nevada Test Site, 65 miles north of Las Vegas. The total amount of the SRS waste covers 6,500 tons. The cleanup program was accelerated through the Federal Recovery & Reinvestment Act, which allocated US$1.4 billion (1 billion euro) to SRS, mostly to speed up environmental-management projects.

According to the Inspector General's report, the newest proposal calls for moving the material to a facility owned by Waste Control Specialists in Andrews, Texas, for interim storage. The auditors note (April 9): "Clearly, this choice carries with it a number of significant logistical burdens, including substantial additional costs for, among several items, repackaging at SRS, transportation to Texas, storage at the interim site, and, repackaging and transportation to the yet-to-be determined final disposition point." A local newspaper, the Augusta Chronicle is citing information from an unnamed source within the department suggesting that it might be better to keep the material at SRS, where it has been 'safely stored for decades', until a permanent disposal solution is found.

Despite assertions by EnergySolutions that the action is unnecessary, the Utah Radiation Control Board signed off on a new rule that imposes additional restrictions on the disposal of DU. EnergySolutions can take no more DU until it shows its radioactive landfill can contain the radioactive waste for thousands of years. The rule, which requires the Clive facility to conduct a performance assessment for disposal of the radioactive material, will be published May 1 and go into effect by June 1. Yet, EnergySolutions is first in line to accept up to 1.4 million tons of DU in coming years - about half from uranium enrichment plants coming online and half from government stockpiles. DU is different from most other Class A because it becomes most hazardous after 1 million years. About 49,000 tons is already buried at EnergySolutions, and DOE has put the disposal of another 11,000 tons on hold until the state agrees it can come to the Clive facility.

EnergySolutions is building a processing facility for blending more hazardous Class B and Class C waste with Class A waste and has proposed to dispose this waste at its Clive facility. Members of the Utah Radiation Control Board opted against trying to regulate this nuclear industry's practice of mixing low-level radioactive waste with more hazardous B&C waste so that reactors can dispose of waste that now has nowhere else to go. "At very least, DU is incompatible with the state's ban on B&C waste," said board member Jenkins, "It will present an unacceptable risk after 100 years." Meanwhile the NRC is studying on options on how to dispose the DU waste in the mid- and long-term.

The entire report by the U.S. Energy Department's Inspector General is available at http://www.ig.energy.gov/ documents/OAS-RA-10-07.pdf

Sources: Augusta Chronicle, The Salt Lake Tribune, Deseret News, all 13 April 2010.
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STOP NUCLEAR POWER – JOIN THE BALTIC SEA INFO TOUR

The Baltic Sea Info Tour will inform about nuclear power and its risks as well as about the renewable alternatives. The Tour group will travel around the Baltic Sea in summer 2010, informing and emancipating young people and calling citizens of all ages to raise awareness of the challenges of nuclear industry and current development surrounding the Baltic Sea area.

(707.6037) Nuclear Heritage Network - The Baltic Sea Info Tour is arranged by different groups, organisations and individuals who share the concern of radioactive pollution. The Tour topics will be arranged by local people. Everyone can take part and join the Tour by informing, arranging local action, joining the network meetings, spreading information about nuclear issues or just showing up in the events. Every step counts!

The Baltic Sea is one of the most radioactively polluted sea compared to other water bodies in the world. This has happened mainly because of the radioactive releases of nuclear power plants in the Baltic Sea area (mostly due Swedish and Finnish power plants), the radioactive particles distributed from the Tschernobyl accident, nuclear bomb tests in the atmosphere and Sellafield's discharges.

Also the Russian and Lithuanian reactors increased the amount of radioactivity in the Baltic Sea. Additionally the proposed uranium mining projects and final disposal sites as well as nuclear transports are strengthening the risk of pollution for the vital sea between Finland, Russia, Baltic States, Poland, Germany, Denmark and Sweden.

Including the impacts of uranium mining, processing of the ore to produce nuclear fuel and the disposal of the created long-life nuclear waste, the operation of nuclear power plants has an immense impact to the global warming. Nuclear power is expensive and dangerous and the resources used in the nuclear industry would be more beneficial for present and future generations if spent in renewable energy systems.

The Info Tour has started as an action of concerned people of the Baltic Sea community. The tour will inform people about the facts of uranium energy and radioactive pollution of the Baltic Sea. The tour will activate and emancipate people to take part in the events of the local stops. The Tour will advance active courage both locally and in large social and ecological systems.

The tour is an informative event, dedicated to the Baltic Sea, embracing the communities surrounding the Baltic Sea. We want to discuss the challenges with people living across the Baltic Sea and to give more information about certain issues connected to radioactivity, nuclear power and renewable alternatives.

The Baltic Sea Info Tour will consist of different kinds of activities: street actions, information events, workshops, performances, discussions, local gatherings, spreading of flyers and posters. The Tour will include several stops in the Baltic Sea countries. It will start from Finland in June and end in Finland in August 2010 visiting: Russia, Estonia, Latvia, Belarus, Poland, Germany, Denmark and Sweden.

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RUSSIA: SAFETY PROBLEMS SURPLUS WEAPONS-GRADE PU DISPOSITION PROGRAM

On April 12, the Russian environmental group Ecodefense released a major new report focused on the use of plutonium as fuel in Russian nuclear reactors. This is the first independent research done during the last decade that exposes the civil plutonium program and its risks for public health and the environment, and comes as the U.S. and Russia prepare to sign an agreement for each nation to dispose of 34 metric tons of plutonium removed from nuclear weapons by using it to generate nuclear power.

(707.6038) Ecodefense! - The Ecodefense report ('Russian Plutonium Program: Nuclear Waste, Accidents, and Senseless Huge Costs') finds that the cornerstone of Russia's program -the BN-800 breeder reactor- has been under construction for over 25 years, has cost over US$6 billion, and remains far from completion.

In the framework of the Russian-US disarmament agreement, each country will "dispose" of 34 tons of weapon-grade plutonium from dismantled warheads. Presently, the governments are planning to use the plutonium in the form of mixed oxide fuel (MOX) in nuclear reactors. Russian breeder reactors BN-600 (in operation) and BN-800 (under construction) will be used for this plutonium disposition. But breeder reactors may be used for both burning and breeding plutonium, which offers to the Russian nuclear industry the possibility of actually producing more plutonium rather than net destruction of the element. Later, the MOX fuel may also be used in Russian light-water reactors (VVER-1200 design).

Environmental groups in both Russia and the U.S. are opposed to the use of MOX fuel and instead promote safer, cleaner vitrification technology to permanently dispose of plutonium.
The report describes the nuclear facili-

ties that will be used for the plutonium program in Russia: * the Beloyarsk nuclear plant near Ekaterinburg city, * NIIAR (Scientific and research institute of atomic reactors) in Dimitrovgrad city, * GHK nuclear weapon facility near Krasnoyarsk city, and * SHK nuclear facility near Tomsk city. The report also focuses on issues of safety, accidents, nonproliferation and public opinion. A public policy issue raised in the report is the lack of liability coverage for a nuclear accident in Russia. This is particularly troubling given the more than 1,000,000 people living in very close proximity of the proposed MOX factory near Ekaterinburg.

On January 21, 2010, Russian government approved a program of advanced technologies
development worth 128 billion rubles (US$4.3 billion or 3.1 billion euro). Most of the funding will go to breeder reactor development.

Fast breeder reactors operating with MOX fuel are being promoted as "advanced technology" in Russia. But it is a little known fact that the BN-800 has been under construction for over 25 years and its design, which pre-dates the 1986 Chernobyl accident, does not meet modern safety requirements. According to the Russian nuclear industry, this reactor will cost nearly US$4 billion, but independent estimates suggest that US$6 billion already has been spent and construction will be finished not earlier than 2014 and likely later.

In a detailed financial analysis, the report concludes that the plutonium fuel program is only
viable because of US and European subsidy for weapons grade plutonium disposition, but given that it may result in a net increase in plutonium stocks, the Russian program will undermine this goal.

The full report in English is available at http://anti-atom.ru/downloads/RuPuApr2010.pdf

Source: Press release 12 April 2010, Ecodefense! and NIRS
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CHERNOBYL: CONSEQUENCES OF THE CATASTROPHE FOR PEOPLE AND THE ENVIRONMENT

'Chernobyl: Consequences of the Catastrophe for People and the Environment is written by Alexey Yablokov, Vassily Nesterenko and Alexey Nesterenko. ' **This book is in contrast to findings by the World Health Organization, International Atomic energy Agency and the United Nations Scientific Committee on the Effects of Atomic Radiation who based their findings on some 300 western research papers, and who found little of concern about the fallout from Chernobyl. They are leaving out the findings of some 30,000 scientific papers prepared by scientists working and living in the stricken territories and suffering the everyday problems of residential contamination with nuclear debris and a contaminated food supply.**

(707.6039) WISE Amsterdam – This new publication of the Annals of the New York Academy of Sciences (Volume 1181), is a collection of papers translated from Russian with some revised and updated contributions. Written by leading authorities from Eastern Europe, the volume outlines the history of the health and environmental consequences of the Chernobyl disaster. Although there has been discussion of the impact of nuclear accidents and Chernobyl in particular, never before has there been a comprehensive presentation of all the available information concerning the health and environmental effects of the low dose radioactive contaminants, especially those emitted from the Chernobyl nuclear power plant. Official discussions from the International Atomic Energy Agency and associated United Nations' agencies (e.g. the Chernobyl Forum reports) have largely downplayed or ignored many of the findings reported in the Eastern European scientific literature and consequently have erred by not including these assessments.

The senior author, Dr. Alexey Yablokov was State Councilor for Environment and Health under Yeltsin and a member of the Russian Academy of Science – since then he receives no support. Yablokov is an Honorary Foreign Member of the American Academy Art and Science (Boston.) Dr. Vassily Nesterenko, head of the Ukrainian Nuclear establishment at the time of the accident, flew over the burning reactor and measured radiation levels. In August 2009, he died as a result of radiation damage, but earlier, with help from Andrei Sakarov, he was able to establish BELRAD to help children of the area. Dr. Alexey Nesterenko is a biologist/ ecologist based in Minsk, Belarus. The book was expertly translated into readable English by Janette Sherman, Medical Toxicologist and Adjunct Professor in the Environmental Institute at Western Michigan University.

The authors abstracted data from more than 5000 published articles and studies, mostly available only in Slavic languages and not available to those outside of the former Soviet Union or Eastern bloc countries. The findings are by those who witnessed first-hand the effects of Chernobyl. This book is in contrast to findings by the World Health Organization (WHO), International Atomic energy Agency (IAEA) and (United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) who based their findings on some 300 western research papers, and who found little of concern about the fallout from Chernobyl.

While the most apparent human and environmental damage occurred, and continues to occur, in the Ukraine, Belarus and European Russia, more than 50 percent of the total radioactivity spread across the entire northern hemisphere, potentially contaminating some 400 million people.

Based on 5000 articles, by multiple researchers and observers, the authors estimated that by 2004, some 985,000 deaths worldwide had been caused by the disaster, giving lie to estimates by the IAEA and World Health Organization.

All life systems that were studied – humans, voles, livestock, birds, fish, plants, mushrooms, bacteria, viruses, etc., with few exceptions, were changed by radioactive fallout, many irreversibly. Increased cancer incidence is not the only observed adverse effect from the Chernobyl fallout – noted also are birth defects, pregnancy losses, accelerated aging, brain damage, heart, endocrine, kidney, gastrointestinal and lung diseases, and cataracts among the young. Children have been most seriously affected – before the radioactive Chernobyl releases, 80% of children were deemed healthy, now in some areas, only 20% of children are considered healthy. Many have poor development, learning disabilities, and endocrine abnormalities.

The government of the former Soviet Union previously classified many documents now accessible to the authors. For example, we now know that the number of people hospitalized for acute radiation sickness was more than a hundred times larger than the number recently quoted by the IAEA, WHO and UNSCEAR. Unmentioned by the technocrats were the problems of “hot particles” of burning uranium that caused nasopharyngeal problems, and the radioactive fallout that resulted in general deterioration of the health of children, wide spread blood and lymph system diseases, reproductive loss, premature and small infant births, chromosomal mutations, congenital and developmental abnormalities, multiple endocrine diseases, mental disorders and cancer.

The authors systematically explain the secrecy conditions imposed by the government, the failure of technocrats to collect data on the number and distribution of all of the radionuclides of major concern, and the restrictions placed on physicians against calling any medical findings radiation related unless the patient had been a certified “acute radiation sickness” patient during the disaster, thus assuring that only 1% of injuries would be so reported..

Below is the New York Academy of Sciences site for the book. Unfortunately, its selling price is now about US$150, which may limit its distribution:
http://www.nyas.org/Publications/Annals/Detail.aspx?cid=f3f3bd16-51ba-4d7b-a086-753f44b3bfc1

Source: Rosalie Bertell on Globalresearch.ca and
http://sustainableloudoun.wordpress.com/

IN BRIEF

New York thwarts reactor relicensing. The U.S. New York state's Environment Department has told Entergy that its Indian Point nuclear power plant (units 2 and 3) can no longer use water from the Hudson River for direct (once-through) cooling, whereby a large volume of water is drawn from the river and discharged back into it, a few degrees warmer. In March the Environment Department introduced a draft policy requiring certain industrial facilities - including nuclear and other power plants - to recycle and reuse cooling water through "closed cycle cooling" technology with large evaporative cooling towers. Water use from the river is then much lower, to replace that evaporated and allow some discharge to maintain quality. (see Nuclear Monitor 706: 'Proposal: cooling towers required for New York reactors')
Entergy has applied to renew the operating licences for the two reactors for 20 years from 2013 and 2015. It estimates that building new cooling towers would cost some US$1.1 billion (805 million euro) and involve shutting down the reactors for 42 weeks.
World Nuclear news, 6 April 2010 / NIRS statement, 12 April 2010

U.K.: Higher bills for nuclear. UK energy minister Ed Miliband has confirmed the Government intends introducing a new 'carbon levy' on consumer electricity bills. While Mr Miliband insisted the levy was to help all low-carbon forms of generation, it is widely accepted the main reason is to help the financing of building new nuclear reactors.
The Conservative Party also wants to introduce a tax on electricity generation to encourage renewables and nuclear power. A clear commitment to nuclear power was also given by the party's energy spokesman, Greg Clark. He said there would be "no limit" on the growth of nuclear power and they wanted to see a new reactor completed every 18 months.
The Government has also announced it will create a new 'green bank', using private money, to finance low-carbon energy developments.
General elections in the U.K. will take place on May 6.
N-Base Briefing 646, 1 April 2010

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.

The WISE/NIRS Nuclear Monitor publishes international information in English 20 times a year. A Spanish translation of this newsletter is available on the WISE Amsterdam website (www.antenna.nl/wise/esp). A Russian version is published by WISE Russia and a Ukrainian version is published by WISE Ukraine. The WISE/NIRS Nuclear Monitor can be obtained both on paper and in an email version (pdf format). Old issues are (after two months) available through the WISE Amsterdam homepage: www.antenna.nl/wise.

NEW ON NIRS WEBSITE

FOIA documents reveal Bush Administration signed contracts with nuclear utilities for government to take waste from new reactors—enough to fill two Yucca Mountain waste dumps—leaving taxpayers at risk for billions of dollars.

New report from Russia's Ecodefense finds Russian plutonium fuel program may produce more plutonium than is disposed; the report also cites safety and cost problems with Russian surplus weapons-grade plutonium disposition program.

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