

NUCLEAR MONITOR

A PUBLICATION OF WORLD INFORMATION SERVICE ON ENERGY (WISE)
AND THE NUCLEAR INFORMATION & RESOURCE SERVICE (NIRS)

wise
World Information Service on Energy
founded in 1978



MARCH 27, 2008 | No. 670

SELLAFIELD MOX FUEL PLANT PRODUCES ALMOST NOTHING

A nuclear plant built at a cost of GBP 473 million to provide atomic fuel to be used in foreign power stations has produced almost nothing since it was opened six years ago, the government has admitted. The mixed oxide (Mox) facility at Sellafield in Cumbria - which was opposed by green groups as uneconomic - was originally predicted to have an annual throughput of 120 tons of fuel. In 2004, BNFL even had to turn to its biggest competitor, the French group Cogema, for help to try to get the plant operating properly. To no avail, as it turns out.

(670.5859) WISE Amsterdam - In late February, the energy minister, Malcolm Wicks, confessed in response to a parliamentary question that the new Sellafield Mox Plant (SMP), built amid great controversy at a cost of £473m (606.5 million euro, US\$950 million), had comprehensively failed to work. Originally designed to produce 120 tons a year of Mox nuclear fuel - made of plutonium and uranium separated from nuclear waste by reprocessing - it had in fact managed only 5.3 tons in five years of operation (that is 0.8 per cent of planned production).

The SMP had managed only 2.6 tons in any one 12-month period between 2002 and 2006-07. In the four years before 2002, the plant had produced annual figures respectively of 2.3 tons, 0.3 tons, 0 tons and 0 tons. Wicks described the SMP as being based on "largely unproven technology" and pointed out that its estimated annual output had been reduced by 2001 to 72 tons. It was originally predicted to have an annual throughput of 120 tons of fuel.

The technical difficulties at the facility and the failure to get anywhere close to its financial targets will add to concerns about the economics of nuclear power, following the government's decision to

give the green light to a new generation of atomic reactors.

British Nuclear Group (BNG), which operates the Sellafield site, said a range of improvements were being made to the facility but it admitted that the 2007-08 period had again seen production disrupted by various problems. BNG has been forced to meet the needs of Swiss and other contracted customers for Mox fuel through buying alternative supplies from France and Belgium.

The SMP was designed to make new fuel from the recycled uranium and plutonium recovered from used nuclear fuel, which had been reprocessed by the nearby thermal oxide reprocessing plant (Thorp) at Sellafield. A Mox demonstration complex was opened in 1998 but was hit by a scandal involving quality control and the falsification of documents, which led to the resignation of John Taylor, chief executive of BNFL.

Attempts to open the main SMP facility led to high court challenges by Greenpeace and Friends of the Earth, which argued that the government's decision to allow BNG's parent group, BNFL, to proceed with opening the facility was unlawful under European law. The Irish government also took

MONITORED THIS ISSUE:

SELLAFIELD MOX FUEL PLANT PRODUCES ALMOST NOTHING	1
22 YEARS ON FROM CHORNOBYL DISASTER	2
ONLY FOUR VESSELS PER YEAR	4
DESPITE CRACK WARNING NRC OK'S EIGHT UNINSPECTED REACTORS TO OPERATE UNTIL NEXT REFUELING	5
IN BRIEF	5
OLKILUOTO 3	8

unsuccessful legal action to stop the SMP opening over concerns about radioactive effluent from the plant polluting the Irish Sea. Jean McSorley, a nuclear campaigner at Greenpeace, said the Mox plant was - along with Thorp (which is still shut after a leak in 2005) - "another great failure of British nuclear engineering" and pointed to the dangers of accepting the industry's economic models and promises. She pointed out that Thorp had been shut for the past three years because of an accident and continual attempts to reopen it had been thwarted by further problems.

As a result of the SMP failure, Sellafield is planning to ship plutonium under

armed escort to France. The cargo of plutonium, in the form of weapons-useable dioxide powder - a highly prized terrorist material - will be secretly transported from Sellafield in French vehicles to local docks and onto the NDA's ship Atlantic Osprey bound for Cherbourg.

The cargo will replace the plutonium used in orders for MOX fuel that had to be produced in European facilities when Sellafield was forced to sub-contract the orders from the SMP because of the plant's failure to produce the goods on time. According to Martin Forwood (CORE) "This clandestine shipment of highly toxic plutonium puts European waters and

communities at significant and unnecessary risk - simply because of Sellafield's inability to make SMP work. This could be the first of many plutonium-swap shipments as a number of SMP orders have had to be sub-contracted to France and Belgium.

Sources: The Guardian, 3 March 2008; The Independent, 9 March 2008; CORE, Press release, 8 March 2008

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22 YEARS ON FROM CHORNOBYL DISASTER Limited Access to Environmental Information Prevails in Ukraine

Ukraine, the site of the worst environmental disaster in recent history, is still failing to protect the right of its citizens to access environmental information. Serious environmental problems remain in Ukraine, including unsafe storage of obsolete pesticides, military chemicals and radioactive waste. Inadequate treatment of industrial waste causes serious atmospheric and water pollution. According to research, 48% of Ukrainians find the condition of their environment unsatisfactory. Speaking about the dumping of toxic waste in the center of a village a local resident told researchers: 'It was the same information policy as during Chernobyl: actually, none'.

(670.5860) Article 19 - This is revealed in a new report, "*For Internal Use Only: Is Post-Chernobyl Ukraine Ready for Access to Environmental Information?*", launched in February by 'Article 19' in Kyiv, Ukraine, and based on several months research in Ukraine. 'Article 19' is a human rights organization with a specific mandate and focus on the defense and promotion of freedom of expression and freedom of information worldwide.

The study shows how the lack of effective access to information has serious consequences for the people of Ukraine, many of whose health and well-being are affected by environmental damage. The lack of information also has serious consequences for the protection of the environment itself, thereby undermining sustainable development.

The three *oblasts* which are the focus of this report are all facing pressing environmental concerns. Kyiv is at the edge of the Chernobyl 30 km zone, as well as being plagued by other

forms of pollution. Donetsk is the most industrialized region of Ukraine and has chemical and metallurgic factories. Lviv also has chemical and metallurgic factories and has been the recipient of toxic waste from Hungary.

The Chernobyl disaster demonstrated dramatically the need for information to protect people's health and the environment. People were deprived of basic information that would have allowed them to minimize the catastrophe's effects. Information on the overall impact of the accident is still sketchy. Recent smaller-scale public emergencies have revealed once again a tendency by the authorities to release inadequate information and conflicting messages, at times with a view to downplaying the risks involved. This is often justified as a measure to contain panic.

However, the interviews in this report have shown that when people are deprived of information, fear and uncertainty grow, leading to high stress

levels as well as misinformed and therefore counterproductive coping strategies. Affected people also have a psychological need to know who was responsible for an accident and that effective measures have been taken to avoid similar incidents in the future.

Lack of information disempowers. It means that people cannot take informed decisions or scrutinize the authorities' actions, and it prevents people from defending their rights.

In Ukraine there is a clear legal requirement for the dissemination of environmental information. There are international guarantees, particularly through the State's ratification of the Aarhus Convention. Domestic law also provides general constitutional guarantees on freedom of information. The Law on Information contains a number of relevant provisions. Moreover, environmental legislation (primarily the Law on Environmental Protection and the Environmental Impact Assessment Law) contains

specific provisions on the requirement to disseminate environmental information, as well as a prohibition on keeping secret information that has an impact on people's health. However, the existing legal guarantees do not specify in sufficient detail how the right to information can be exercised and what measures public bodies must take to ensure access to information. Different laws also contain contradictory provisions. This points to the need for a number of legal reforms.

A number of factors contribute to the culture of secrecy. They include the political and business elite's perception of natural resources as a means for personal enrichment; widespread corruption; excessive bureaucracy in policy development; the lack of commitment by the authorities to establish effective dialogue with the public; public officials' failure to comply with the legislation and limited political will in resolving environmental problems; insufficient funding and resources for the implementation of policies on environmental information and public participation; the failure by the Ukrainian authorities to prioritize environmental issues; frequent changes in political leadership leading to lack of continuity and loss of experience; and lack of incentives for environment-friendly production.

In Ukraine civil society and the media play an important role in Ukrainian society in educating and informing the public on matters of public interest, including the environment. NGOs have undertaken several educational programs, as well as training for public officials. The latter has had some success (although some public officials have shown little interest). An important instrument used by civil society to increase the transparency of the institutions has been strategic litigation. NGOs have reported success in challenging the system when information was denied. This is important not only to obtain specific pieces of information but also to challenge the overall practice of refusing information without legitimate cause.

There is a small number of excellent, dedicated journalists, investigating and

alerting the public about environmental hazards, and the media have increased coverage of environmental issues. However, in most cases, such information is not sufficiently detailed to enable the public to make informed choices in relation to their health and environment.

Often, the media limits itself to carrying information on environmental catastrophes when these occur, rather than devoting time and effort to investigating complex environmental issues in the public interest. In addition, although media freedom has increased, particularly since the Orange Revolution, some journalists have been harassed when covering sensitive subjects, including environmental issues. This has caused many journalists simply to shy away from these topics. An aggravating factor is journalists' lack of knowledge and experience in environmental issues and in investigative journalism: a number of journalists interviewed admitted to limited knowledge in these areas. This can be addressed by providing more opportunities for journalists to receive high-quality, specialized training. Similarly, many civil society organizations would benefit from training to develop the know-how required to promote access to environmental information effectively.

Even if the media and civil society had more resources, they could not replace the State as the primary disseminator of information. It is encouraging that some mechanisms for information sharing and consultation (such as public councils and public hearings) have been established. These represent a significant step towards transparent and participatory governance. However, they need to be substantially strengthened if they are to have a real impact. Even some of the public officials interviewed recognized that some such mechanisms are little better than 'mock' procedures. In order to make these mechanisms more effective, national and local authorities need to establish detailed policies to increase the level of environmental information available and public participation in decision-making.

The Internet has become an important

means of disseminating information in Ukraine, and public bodies now have websites. The Internet is an important information tool, and it often accessible to young people, particularly students, who, according to Eco-Pravo Kyiv, make up the social group that is most active in the area of environmental protection. However, two related problems remain. Firstly, overall only a small section of the population has access to the Internet. Secondly, the information on public websites is often overly general. The improvement and regular update of Internet sites (including, for example, the publication of reports and the results of EIAs) and the creation of readily accessible databases would improve access to information and reduce the need to lodge requests. This would also reduce the negative effects of a system in which the granting or refusal of information often depends on the discretion of an individual official. Environmental bodies' press releases and liaison with the media also need to be enhanced.

This and other problems are exacerbated by the limited awareness of environmental issues among the general population. Although many people are acutely aware of the hazards posed by radiation, in reality only a minority is concerned about general environmental issues. This is a result of the lack of educational policies by the State, and the still (overall) limited media coverage of environmental issues. Understandably, most people are primarily interested in environmental hazards that have a direct impact on their lives. Their need for information emerges in cases where their neighborhoods are threatened by the construction of environmentally hazardous facilities; the felling of trees and elimination of green zones near their homes; the excessive density of housing; or environmental emergencies. In addition, people are frequently concerned about how poor environmental conditions might have an impact on their - often dire - financial situation. In these cases, people may request information from State bodies, but the bureaucratic obstacles are at times so daunting that they prefer to approach the authorities only when absolutely necessary. More often, those

requesting information are representatives of civil society or the media.

<http://www.article19.org/pdfs/publications/ukraine-foi-report.pdf>

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The full report can be found at:

Source and contact: Article 19, by Anoush Begoyan

ONLY FOUR VESSELS PER YEAR

Anyone willing to build a nuclear power station has to line up in Japan. There is the only plant in the world, Japan Steel Works Ltd.,(JSW) capable of producing the central part of a nuclear reactor's containment vessel, in a single piece. Currently the company makes four of the steel forgings a year. Forging is the term for shaping metal by using localized compressive forces. Hot forging is done at a high temperature, which makes metal easier to shape and less likely to fracture. Plans to double capacity in the coming years are underway but already under constraint due to the run for steel on the world markets. About 600 tons are required to make the central reactor-vessel part. Areva, building the new EPR in Flamanville, France, has already had to revise its estimate for the reactor with 10% from the original estimate, as a result of rising raw materials costs.

(670.5861) WISE Amsterdam - The Japanese steel company makes good money as potential builders have to pay US\$100 million upfront, sometimes even ten years before the equipment will be delivered. And the builders are in line, several of them have been reserving slots for Japan Steel gear, even though they not expect to have reactors build before 2015.

According to the World Nuclear Association as many as 237 reactors may be built globally by 2030, an average of more than 10 a year. That compares with 78, or fewer than four a year, started since the 1986 Chernobyl meltdown in Ukraine. That is an impossible task for the Japanese steel firm. All countries but Russia (who makes its own forgings) depend on Japan. And it would take any competitor more than five years to catch up with Japan Steel's technology. In the United States the industrial and manufacturing infrastructure that existed in the 1970s has been dismantled. The majority of the hundreds of facilities that then produced nuclear components disappeared after the halt in new plant orders and cancellation of more than 100 existing orders in the last 30 years.

One of the first capabilities shut down was the facilities that made the largest components, such as pressure vessels, for nuclear power plants. Even though the US industry is talking about re-

instead of the more than 600 tons required today. Another alternative is to turn back the technological clock and weld together two smaller forgings. That technique was used over the past 40 years in the U.S. and France and is still applied in China.

The first step in the process to make large nuclear components is what they call forgings. So, for example, picture a reactor vessel head, which is like the closure piece, or top hat, for a reactor vessel. You need a manufacturer who can pour a hot ingot of steel and press that into a rough shape of that closure head, and give you this roughly machined forging, roughly in the shape of a head. Then that head is shipped to a manufacturing facility that does the precision machining, cladding, surface finish, and welds on any attachments, such as the control rod drive mechanisms, etc., and then it ships it.

To make the 600-ton ingot, Japanese workers heat steel scrap in an electric furnace to as high as 2,000 degrees Celsius (3,600 degrees Fahrenheit). Then they fill each of five giant ladles with 120 tons of the orange-hot molten metal. Argon gas is injected to eliminate impurities, and manganese, chromium and nickel are added to make the steel harder. The mixture is poured into a blackened casing to form ingots 4.2 meters wide in the rough shape of a cylinder. Five times over three weeks, the ingots are pressed, reheated and re-pressed under 15,000 tons applied by a machine that rotates them gradually. The heavy forging is needed to make the steel uniformly strong by aligning the crystal lattices of atoms that make up the metal, known as the grain.

establishing a nuclear industry, the first step, the forgings, are still only made by the Japanese.

American and Korean rivals are working hard to break the Japanese almost monopoly and Areva, the world's biggest reactor builder, is considering modifying its newest design to be able to make a vessel from a 350-ton ingot

Of course all depends on the real developments of the nuclear markets. So far talks about the nuclear renaissance have been proven to be rhetoric rather than reality.

Japan Steel is cautious about expanding too rapidly. Orders plummeted after the German decision (in 1998) for a gradual phase-out. JSW was unprofitable for three straight years. The US market, seen as crucial for the way the nuclear industry will be able to develop, more and more power producers are putting their applications on hold, having to negotiate pricing and details with suppliers while waiting for the outcome of the presidential elections. Additional lead time may need to be included in the reactor pressure vessel procurement schedule depending on ability of JSW to supply the required reactor pressure vessel large ring forgings in a timely manner. This potential shortfall is a significant

construction schedule risk and could be a project financing risk. JSW has supplied about 130 or 30% of the currently operating nuclear reactor vessels in the world.

JSW is aiming to produce sufficient forgings to supply the equivalent of about 8.5 sets a year by 2010. The problem is the term "equivalent" because it is unclear how much of the forging capacity is dedicated in

practice to new nuclear projects. JSW also supplies, for example, fossil fuel turbine and generator rotors to China.

Of course, more countries are thinking of producing vessels for their domestic nuclear market (even the UK for instance), but it is an illusion to think that will solve the problem in case of a growing nuclear capacity, it certainly will not in the coming decade.

Sources: Bloomberg, 12 March 2008; Executive Intelligence review, 11 August 2006; World Nuclear Industry Status Report 2007, M. Schneider and A. Froggatt

Contact: WISE Amsterdam

DESPITE CRACK WARNING NRC OK'S EIGHT UNINSPECTED REACTORS TO OPERATE UNTIL NEXT REFUELING

On March 14, 2008 the Nuclear Regulatory Commission approved the continued operation of eight US Pressurized Water Reactors (Seabrook, Braidwood-2, Comanche Peak-2, Palo Verde-2, Summer, South Texas-1, Vogtle-1 and Waterford-3) which have not inspected for potentially safety-significant pipe cracking around nozzle pipe welds in the reactors' pressurizer component. Ten days earlier, NRC called an emergency meeting for March 13 after reviewing alarming analysis showing serious flaws in welds of dissimilar alloys on five of six nozzles in a pressurizer removed from the St. Lucie reactor. Three flaws were discovered to run fully circumferential around the pipe and range in depth from 69% to 80% through the wall of the safety nozzle pipe.

(670.5862) **Beyond Nuclear** - US pressurized water reactors had first been advised by NRC in the spring of 2007 to shut down for safety-related inspections to be completed by December 31, 2007. NRC granted extensions to nine reactors, including the Diablo Canyon unit 2 which recently began its refueling and inspection outage, allowing them to run until regularly scheduled outages by June 2008. A March 11, 2008 NRC press release raised the possibility that the reactors might need to shut down immediately for inspection and repairs because of the St. Lucie findings. A pressurizer nozzle pipe break can result in the rapid depressurization of the reactor potentially causing other component failures and a Loss-Of-Coolant-Accident.

The NRC's on again-off again vacillation over whether to stand behind its call for prompt emergency inspections arose out of concerns in October 2006 when NRC and industry

discovered extensive cracking on the same component at the Wolf Creek pressurized water reactor. This was the first time that multiple primary water stress corrosion cracking had been identified by circumferential cracks on welds of dissimilar materials on the nozzles of the pressurizer. Once started, such cracks can grow independently and merge together potentially resulting in a surprise pipe break before any leak is detected.

At the hastily called March 13, 2008 emergency meeting, industry argued before a packed auditorium at NRC's Rockville, Maryland headquarters that the "indications on the pressurizer safety nozzle welds did not represent an immediate safety concern." The meeting revealed conflicting interpretations of ultrasonic testing (UT) results. EPRI first used a single qualified UT analyst that determined the St. Lucie flaws could be evidence of primary water stress corrosion cracking that "would require immediate repair." A subsequent "confirmatory" re-analysis

by an industry team using computerized scanned 3D UT images and radiography interpreted it was not cracking but fabrication flaws (i.e. embedded artifacts in weld slag).

Once again, NRC extended benefit of the doubt to reactor operations versus prompt shut down to inspect and safeguard public safety. This scenario, indeed gamble, is disturbingly reminiscent of the agency's November 2001 abandonment of an Order to shut down the Davis-Besse reactor for prompt inspection of stress corrosion cracking responsible for what was later discovered to be extensive corrosion in the reactor vessel head potentially weeks away from rupture.

Source and Contact: Paul Gunter, Beyond Nuclear, 6930 Carroll Avenue, Suite 400 Takoma Park, MD 20912, USA Tel: +1-301.270.2209 Email: info@beyondnuclear.org

IN BRIEF

USEC: ACF to cost US\$3.5 billion. Cost estimates for the American Centrifuge Plant have jumped by about 50% from USEC's projection a year ago, to about US\$3.5 billion (2.2 bn euro), the company said in a progress report on the enrichment plant project. In February 2007, USEC said its target cost estimate was US\$2.3 billion, which included amounts spent to date but did

not include contingency and financing costs. In September, the company said that based on procurement trends, a "general contingency" of 15% to 20% on top of its original estimate would be reasonable. USEC says it's still in the midst of preparing a project budget but expects the figure will be about US\$3.5 billion, excluding financing costs or overall contingency costs. USEC is still sticking to their announced timetable, which calls for initial deployment of the plant in late 2009. USEC stock, which was trading above US\$9.00/share before the announcement, has lost more than one-third of its value since then.

Nuclear Fuel, 3 March 2008

German RWE to invest in Belene? German utility RWE is poised to become the key investor in the planned Belene nuclear power plant. A source close to the process said that Bulgaria short-listed RWE and Belgian Electrabel, owned by France's Suez for a 49 percent stake in the 4.0 billion euro (US\$6.18 billion) plant at the Danube River town of Belene earlier in March. Power grid operator NEK would retain 51 per cent in the plant. Reuters is quoting an anonymous source saying RWE is the clear favorite for now "There are talks between the two bidders to see whether they can share the minority stake between them, with RWE having the leading role."

The source said RWE has offered about 400 million euros in investment immediately so that the project to build two 1,000 megawatt reactors starts quickly. The global credit crunch makes the financing of the plant, whose capital cost could reach six billion euros, difficult and RWE's offer has played a vital role. Two French banks, Societe Generale and BNP Paribas, have expressed interest in structuring the debt for Belene. Bulgaria picked Russia's Atomstroieksport, controlled by gas company Gazprom, to build the twin 1000-MW reactors at Belene, the site where it planned a second nuclear power plant, whose construction was frozen after the fall of communism. France's Areva and Germany's Siemens would act as subcontractors. Bulgaria wants the 2,000 megawatt nuclear plant to make the country a major electricity exporter in the Balkans again after it was forced to shut communist-era reactors as a condition of joining the European Union. RWE is not yet active in the electricity market in Central Europe, though they have some activity in Romania and the gas distribution in the Czech Republic.

Reuters & Sofia Echo, 24 March 2008; Email Jan Haverkamp, 24 March 2008

US: NRC cut public out of meeting on new nukes. Federal regulators abruptly halted a public meeting on March 11, after problems arose with Progress Energy's application for new nuclear plants, then continued private discussions with company officials. Watchdog group NC WARN (Waste Awareness & Reduction Network) said the move violates federal policy. The charge against NRC comes amid widespread criticism that the review process for proposed new reactors is heavily slanted against open involvement by public interest groups, or local and state governments. The March 11 session was the first scheduled discussion of the technical aspects of Progress' February 19 application, which is thousands of pages long.

Representatives from Progress Energy were the ones to suggest that issues be resolved 'after the meeting.' Nothing being discussed was proprietary or safeguards-related, so all of the meeting should have been public. The problems discussed involved site geology and the availability of cooling water. "This is an early warning sign for the so-called Nuclear Revival," said NC WARN. "For Progress Energy to already be dodging difficult issues - until the doors are closed doors - does not bode well for the chance of completing a new design reactor safely or on budget." WARN noted that cost estimates for new plants have tripled in the past two years, and that project delays or cancellations are likely. In the 1980s, Progress and other utilities cancelled 60 plants in midstream due to what Forbes magazine called "the worst managerial disaster in business history."

NC WARN, News release, 11 March 2008

Namibia: Farmers alarmed by water permit for uranium mine. Farm owners in the Valencia area in Namibia's central northwest are up in arms over the government granting Forsys Metal's Valencia Uranium project a permit to extract 1,000 cubic meters of water a day. In February, Forsys Metal announced on its website that it had received a permit for the extraction of groundwater for the Valencia Uranium Mine from the Ministry of Agriculture, Water and Forestry. It said the permit allows it to extract up to 1,000 cubic meters of water a day - "a sufficient quantity to continue with the development of the mine". The permit is valid for two years, during which time 730,000 cubic meters of water would be extracted. A farm uses less water in 36 years than Valencia intends to extract in a month. Seventy per cent of the Valencia project is owned by Forsys Metals, while a Namibian BEE company, Ancash Investments enjoys a 30 percent share.

Namibian, 7 March 2008

Nuclear phase out in Belgium: still standing. On Thursday 20 March the new Belgian federal government was established. The governmental declaration does not make any reference to the nuclear phase out law. This means that the phase out proceeds as planned, with the first reactors to be closed in 2015. The government will continue research into transmutation of nuclear waste. The government will order a new analysis of the Belgian energy mix. A group of national and international experts should come forward with an advice, which should enable the government to evaluate the phase out by the end of 2009. Given that the current government is not expected to last for long, this de facto means that the next government will again have a discussion on the role of nuclear in the Belgian energy mix.

Email Bram Claeys, 22 March, 2008

Fuel to be removed from Chernobyl's still active reactors in April. The Ukrainian Emergency Situations Ministry plans to withdraw nuclear fuel from all reactors of the Chernobyl nuclear power plant by April 26 as part of the government's plans to

finally shut down the plant, the site of the world's worst nuclear disaster. "A plan of actions was worked out to stop the operation of the Chernobyl nuclear power plant. I guess as early as in April we will withdraw the last fuel elements from the plant's reactors," Emergency Situations Minister Volodymyr Shandra told a press conference. "Thus, by the 22rd anniversary of the catastrophe, all the reactors, except for the fourth, will be without any nuclear fuel. It will be a very serious step towards providing the security of the Chernobyl plant." Shanndra also said that in autumn of 2008, the building of a confinement enclosure over the ad hoc cement sarcophagus that was dumped on the site of the meltdown in 1986, and which is cracked and crumbling, will commence. "The financing of design works has already opened. I believe this autumn the design works will be completed, and the building will kick off," the Financial quoted him as saying.

Bellona Foundation, 18 March 2008

S.A.: Nuclear industry backs down. The powerful South African nuclear industry has backed down and withdrawn the complaint it laid with the Broadcasting Complaints Commission (BCC) over the screening by Carte Blanche of *Uranium Road*, a documentary about the country's nuclear industry. The hearing, planned for February 20, was cancelled because a settlement was reached with M-Net. It is understood that the settlement involves Carte Blanche screening a follow-up program on the nuclear industry. Earthlife Africa believes that the nuclear industry has in this way managed to make claims about the veracity of the film and yet has avoided having to substantiate their criticism of the documentary in a public forum. Earthlife Africa believes that the nuclear industry representatives agreed to a settlement because of the publicity surrounding the hearing, and that they were keen to avoid public scrutiny.

Uranium Road is a documentary about the history of the nuclear industry in South Africa as well as the present status of nuclear power in the country. It was screened on Carte Blanche, M-Net's current affairs program, in November 2007. It raised questions about the nuclear industry and was intended to generate public debate. Dr Rob Adam, who was interviewed in the film, laid a complaint on behalf of NIASA (Nuclear Industry Association of South Africa).

Press release, Earthlife Africa Cape Town, February 20, 2008

U.K.: Heart disease link. A study commissioned by British Nuclear Fuels and the Nuclear Decommissioning Authority has found a link between heart and artery disease and the exposure of nuclear industry workers to radiation. The study looked at the health records of 65,000 people employed at Sellafield, Capenhurst, Spingfields and Chapelcross between 1946 and 2005. Scientists found a strong statistical association between increasing radiation exposure and heart and circulation diseases. The results of the study have been published in the International Journal of Epidemiology.

N-Base 560, 6 March 2008

German nuclear industry: Die Linke jeopardizes ending phase-out. Nuclear advocates in Germany are afraid that the rise of the recently-formed Left party -- Die Linke -- could scuttle efforts by Germany's two pronuclear parties (the right-of-center Christian Democrats, CDU/CSU, and pro-business Free Democrats, FDP) to form a national parliamentary majority in 2009. Such a coalition could end or at least stall the scheduled shutdowns of a half-dozen German power reactors. The Left party was formed in mid-2007 out of the former Communist party which, until 1990, ruled the German Democratic Republic, GDR, and from disgruntled members of the Social Democratic Party, SPD. The Left party -- like the SPD and the Greens -- opposes nuclear power generation.

The Left party currently represents about 20% of the popular vote in all six state parliaments in the ex-GDR, but it didn't cross the 5% popular vote hurdle to take seats in a western German state parliament until the January 28 elections in Hesse and Lower Saxony. Analysts predict that support for the Left party may grow in western states and that the group might establish itself as Germany's fifth national parliamentary party. If that happens, they said, it will be far less likely that the country's two pronuclear parties will be able to form a government after the next federal election in 2009. Until now, Germany's nuclear industry has been counting on the CDU/CSU and FDP together winning the 2009 election and then overturning the phase-out.

Nucleonics Week, 7 February 2008

Depleted uranium turns earthworms into glowworms. Significant levels of radioactive uranium isotopes were found in the flesh of worms at the Ministry of Defence's Dumfries weapons range last year, according to a report published in the Journal of Environmental Monitoring. Worms are a crucial part of the ecosystem, aerating the soil and aiding the nutrient uptake of plants. If they are contaminated, it suggests the wider environment is tainted. The report said: "Many of the soil samples from the Dundrennan Firing Range had uranium concentrations and isotopic signatures indicative of contamination with DU. Furthermore, plants and earthworms collected from above and within contaminated soils respectively also had uranium isotopic signatures strongly influenced by DU, indicating that DU was indeed assimilated into biological tissues."

More than 6000 DU shells have been fired into the Solway Firth at Dundrennan, amounting to more than 20 tons of nuclear waste. The tests have been linked to increased rates of cancer and leukaemia in the area. Depleted uranium is used to make hard tips for armour-piercing rounds. When they explode, the uranium turns into a fine powder which is carried on the wind for miles around. In Iraq and Kosovo, the use of the shells has been blamed for horrific birth defects as well as being implicated in causing Gulf war syndrome.

Sunday Herald (Scotland, UK), 23 March 2008

Fact sheet: Olkiluoto 3

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World's largest, first-of-a-kind nuclear reactor is being built in Olkiluoto, Finland by the French company Areva. The construction started in 2005 and was the first nuclear plant ordered in developed countries for more than a decade. The project has been plagued from the onset by quality problems, delays and cost overruns.

Promises and reality

In Finland, parliament has the final say on nuclear projects. Here is what the parliament was told about the project before their vote by TVO and by the pro-nuclear trade and industry ministry that produced the material that "guided" the parliament in their decision.

Olkiluoto 3 is often presented as a showcase of an open process in a democratic country. The process might have been democratic but the information that the democratic decisions were based on has turned out to be false and misleading.

Promise: Olkiluoto 3...	Reality
<i>...will cost EUR2.5 billion and take 4 years to build.¹</i>	The contracted price was EUR3.2 billion and the agreed construction time 4.5 years. The cost overrun is EUR1.5 billion so far, putting realized cost at about EUR5 billion. Construction will take at least 7 years. ²
<i>...is the easiest and cheapest way to reach Kyoto targets.³</i>	The emission reductions that OL3 was claimed to deliver were overblown. It was supposed to reduce CO ₂ emissions by 7.5 million tons per year, but now the reductions are expected to be a third of this ⁴ . The delay of the reactor means that it will not help in reaching the Kyoto target practically at all since it will come to operation only a year before the Kyoto target period ends. A lot of emission reduction options were abandoned because Olkiluoto 3 was expected to deliver the needed reductions. Reaching Kyoto targets would have been easier and cheaper without Olkiluoto 3.
<i>...will deliver cheap electricity, saving consumers EUR0.5 billion a year⁵</i>	According to Finnish heavy industry, the delay of OL3 will cost electricity consumers EUR3 billion - or EUR600 per person - in higher prices. ⁵ Electricity price during 2008-2012 would have been lower had Olkiluoto 3 not been built.
<i>...is a market financed private investment⁶</i>	The French export credit agency Coface and several public banks headed by Bayerische Landesbank are involved in ensuring a very low interest rate and favorable terms for the project. ⁶ About 60 % of direct investment comes from companies controlled by Finnish state and municipalities. ⁷
<i>...will offer jobs to Finnish workers. Half of the investment will stay in Finland.¹</i>	All significant subcontracts have been won by foreign companies and even in Olkiluoto itself, about a third of the workforce is Finnish. ⁸ A maximum of 25% of the investment stays in Finland. There would have been more jobs and business opportunities had Olkiluoto 3 not been built and renewable energy sources be allowed to grow instead. ⁹
<i>...is going to reduce Finland's reliance on energy imports from Russia⁹</i>	Imported gas is used for district heating and peak load generation - nuclear power cannot provide either. Also electricity is imported mainly in situations of high demand. Because of the failure to increase energy efficiency in buildings as well as the in the housing and services sector, Finland will be more reliant on Russian electricity and gas after Olkiluoto 3 is in use than before the decision to build it. ¹⁰
<i>...will not hinder development of energy efficiency and renewable energy. New policies will be introduced.¹</i>	Development of renewable electricity sources, especially wind, has lagged behind and development of combined heat and power has ceased. ¹¹ Despite huge potentials, Finland is ranked by Ernst&Young the third least attractive country for investments in renewable energy and least attractive for wind. The ranking covers 25 countries. ¹² (see also figure 1)

Safety problems¹³

Olkiluoto 3 was also supposed to be way safer than present reactors, "set a new standard" for nuclear safety. In early 2007, the Finnish nuclear safety authority STUK had detected 1500 safety and quality problems in the OL3 project, ranging from

minor to critical.¹⁴ The authority themselves said that the number of problems is so large that it is possible that all of them are not detected¹⁵.

It is alarming that there have been problems in manufacturing all the key parts of the primary circuit of OL3. The primary circuit is the subsystem of a nuclear power plant that is probably most crucial to safety. The primary circuit is subject to extreme heat, pressure and radiation for decades. Its components are hard, some impossible, to replace once the reactor is in use.

Examples of problems

- The primary coolant circuit was found to have too large and irregular grain size. The problem was caused by an attempt by the subcontractor to save time and reduce costs. All eight pipes have been recast but it is unclear whether the new methods have actually resolved the problem or caused new ones. Failure of the primary coolant circuit can initiate a severe nuclear accident.
- Steel liner of reactor containment was manufactured by a Polish machine yard that had no earlier experience of nuclear projects. Safety standards were violated in welding and holes were cut in wrong places. The bottom of the liner is wavy and it was damaged during storage. The substandard quality of the liner can lead to higher radioactive releases in case of an accident.
- Concrete base slab of the reactor is more porous than was allowed, making the structure more vulnerable to chemically reactive substances. This can lead to long term deterioration of the reactor containment building. The concrete has a high water content, which could, under certain accident conditions, lead to rapid formation of cracks.

What caused the problems?

- Olkiluoto 3 is constructed under a tight schedule, with considerable cost pressure. The same is likely to hold for any future nuclear projects. The unrealistic price and timetable of Olkiluoto 3 have been a strong incentive for Areva to cut down prices and to refuse to perform time-consuming corrections when problems arise. Areva's attempts to reduce costs led the company to select cheap, incompetent subcontractors, overlook safety related problems and not to provide nuclear safety training to workers.
- Construction of Olkiluoto 3 was allowed to commence before the design of the reactor was finalized ("fast track licencing"), even though this should not be legal in Finland. Nuclear industry has high hopes of cutting down lead times through this procedure and governments in e.g. the US and UK are under pressure to legalize it. Because of fast track licensing, Olkiluoto 3 subcontractors have used outdated blueprints and Finnish authorities have been at times unable to supervise work as they haven't had the design documents.
- New reactor designs are inherently harder to build and control because of larger size and fuel burn-up, which places high demands on construction.
- The stagnation of nuclear construction over the last decade or two has caused a lack of competent personnel and companies. Together with complicated project structures (Olkiluoto 3 involves over 1000 subcontractors from over 25 countries) and long control chains, this makes quality assurance prone to failures.

Waste storage

In Olkiluoto, nuclear waste company Posiva is conducting a research project on the possibility of burying highly radioactive nuclear waste permanently underground. No permission to build a nuclear waste storage site has been granted and at least five years of more research is needed before the company is even ready to apply for a permit. There are several concerns and open questions that have not been addressed.

The status of the project¹⁶

- The government has made a decision in principle that construction of a waste dump in Olkiluoto would be in the overall interest of the society if the environmental requirements can be met. The decision allows the construction of an underground rock characterization facility which is now underway.
- Little site specific research was undertaken before the decision, that's why the decision is "in principle". The only stance that government authorities have officially taken so far is that they cannot without further research exclude the possibility that the requirements can be met.

Concerns

- Basically all research at the site is conducted by the waste disposal company itself without real independent review. The Finnish authorities have commissioned independent experts to give a second opinion and they have raised exactly the same concerns as environmental organizations - too much haste and too few observations, problems being overlooked. The recommendations of these experts have not been followed in most cases though.
- When the storage site would be closed it would be fully at the responsibility of the society. There are no plans or money set aside for monitoring the site or retrieving the waste and cleaning up the mess in the case of leakage.
- The bedrock in Olkiluoto is very old and full of cracks, and most importantly the groundwater there flows directly to the Baltic sea, which dramatically aggravates the possible impacts of any leaks in the repository. Olkiluoto was chosen for waste storage because of political reasons - the population living near the reactors is much less critical because of decades of intense "education" by the nuclear operator.
- The plan is to pack the waste in copper canisters, because copper is the most corrosion resistant metal after gold and silver. It was assumed that the canisters would last thousands or tens of thousands of years, but new peer-reviewed research published in the Science magazine shows that the canisters could be corroded in a century.

- The understanding of the long term dynamics of the bedrock has advanced hugely after the waste disposal concept applied in Olkiluoto was put together. The bedrock is much more dynamic than previously believed, for example there can be strong earthquakes associated with ice ages, which undermines the whole idea of stable bedrock.

The waste disposal project has proceeded faster than anywhere else in the world and that has led to overlooking some expert recommendations and too much haste in initial phases of site characterization. There is no real need for the hurry, since the waste will have to cool down in intermediate storage sites for decades after the reactors are closed down. The nuclear industry, however, desperately needs to be able to say that they have a "solution" to the problem of nuclear waste - in order to get to build more reactors.

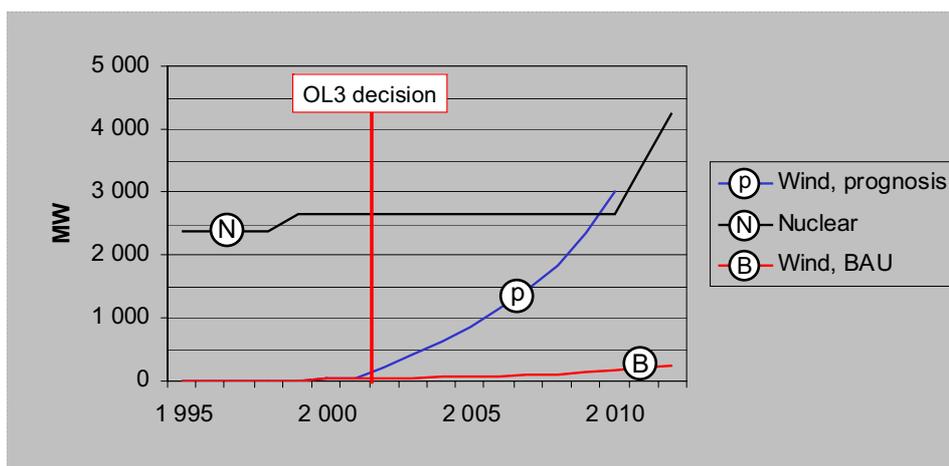


Figure 1. In 2001, Wind power capacity in Finland was projected to reach 3000 MW by 2010 (blue curve), which could have created 10 000 jobs. After the decision on OL3, made in 2002, interest in renewables evaporated and the prospects for wind power look bleak (red curve).

NOTES:

- ¹ Finnish cabinet of ministers, January 2002 - decision-in-principle on the construction of OL3. <http://www.tem.fi/files/13606/tvo1401.pdf>
- ² AFX News Limited, 28 Sep 2007: TVO says won't share nuclear reactor cost overruns with Areva. <http://www.forbes.com/markets/feeds/afx/2007/09/28/afx4165822.html>
- ³ Valtioneuvosto 27.3.2001: Kansallinen ilmastostrategia VNS 1/2001. [Finnish cabinet of ministers 27 March 2001: National climate strategy.]
- ⁴ Finnish Energy Industries 2008: Sähkötuotantokenaariot vuoteen 2030. <http://www.energia.fi/>
- ⁵ Kauppalehti (Finnish financial newspaper) 11 Sep 2007: Olkiluodon myöhästyminen maksaa kolme miljardia euroa. <http://www.kauppalehti.fi/avar/plehti/index.jsp?xid=2546439&date=2007/09/11>
- ⁶ European renewable energies federation press release 24 Oct 2006. http://www.eref-europe.org/dls/pdf/2006/eref_pr_241006.pdf
- ⁷ TVO Ownership and finances. <http://www.tvo.fi/www/page/261/>
- ⁸ Finnish Broadcasting company YLE 11 Oct 2007:

- Ydinvoimalan kotimaisuusaste voi jäädä tavoitteista. <http://www.yle.fi/uutiset/24h/id72082.html>
- ⁹ Wind power alone could have created 10000-20000 jobs: Tuulivoima Suomessa - Vientinäkymiä ja päästövähennyksiä. CLIMTECH 2/2002. www.vtt.fi/pro/climtech/material/climtech_2-02_fin2.pdf.
 - ¹⁰ Energy scenario report commissioned by the Finnish government as a basis for the 2005 energy strategy. Forsström, J. and Lehtilä, A. 2005: Skenaarioita ilmastopolitiikan vaikutuksista energiatalouteen. VTT Processes. <http://www.vtt.fi/int/pdf/workingpapers/2005/W36.pdf>
 - ¹¹ See for references and graphs Lauri Myllyvirta 2007: Real, nuclear-free energy solutions for Finland. <http://www.olkiluoto.info/en/18/3/127/>
 - ¹² Ernst&Young 2007: Renewable Energy Country Attractiveness Indices Q3. http://www.ey.com/GLOBAL/content.nsf/International/Oil_Gas_Renewable_Energy_Attractiveness_Indices
 - ¹³ For a detailed analysis and references, see Hirsch H., Neumann W. Progress and Quality Assurance Regime at the EPR Construction at Olkiluoto - Safety Implications of Problems Encountered. May 2007. <http://www.greenpeace.org/raw/content/finland/fi/dokumen tit/progress-and-quality-assurance.pdf>

- ¹⁴ Helsingin Sanomat International edition 11 Aug 2007: Further nuclear reactor construction delays could lead to electricity shortage.
- ¹⁵ Finnish Radiation and Nuclear Safety Authority STUK 2006: Management of safety requirements in subcontracting during the Olkiluoto 3 nuclear power plant construction phase. http://www.stuk.fi/stuk/tiedotteet/2006/en_GB/news_419/_files/76545710906084186/default/STUK%20Investigation%20report%201_06.pdf
- ¹⁶ The decision in principle by the Government concerning Posiva Oy's application for the construction of a final disposal facility for spent nuclear fuel produced in Finland. 2001. http://www.stuk.fi/ydinturvallisuus/ydinjatteet/loppusijoitus_suomessa/en_GB/luvat/_files/73810747422542880/default/decision_in_principle.pdf

The NUCLEAR MONITOR

The Nuclear Information & Resource Service was founded in 1978 and is based in Takoma Park, Maryland. The World Information Service on Energy was set up the same year and is housed 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.

The 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, a Ukrainian version is published by WISE Ukraine (available at www.nirs.org). Back issues are available through the WISE Amsterdam homepage: www.antenna.nl/wise and at www.nirs.org.

Receiving the Nuclear Monitor

US and Canadian readers should contact NIRS to obtain the Nuclear Monitor (address see page 11). Subscriptions are \$35/yr for individuals and \$250/year for institutions.

New on NIRS Website: www.nirs.org

March 27, 2008: Stop the Import of Radioactive Waste! Support HR 5632.

March 21, 2008: Testimony of former NRC Commissioner Peter Bradford to South Carolina PSC on the economics of Duke Power's proposed Lee reactors, nuclear power and climate and more. PDF Very useful!

WISE AMSTERDAM/NIRS

ISSN: 1570-4629

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Editorial team: Dirk Bannink and Peer de Rijk.

With contributions from WISE Amsterdam, Beyond Nuclear, CORE, Earthlife Africa, Greenpeace International and Laka Foundation.

Next issue of the Nuclear Monitor (671) will be mailed out on April 17, 2008.

Greenpeace EPR-campaign

As they have chosen the development of the EPR (Evolutionary Pressurized Reactor) as their campaign focus for this year, WISE has decided to facilitate Greenpeace International with at least one page per issue of the Nuclear Monitor. We think this work is crucial and we think the provided material and news is useful for all of us, everywhere.

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