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S-AFRICA: ESKOM: RECORD LOSS; PBMR "INDEFINITELY POSTPONED"

Eskom, South Africa's state-owned utility, has reported a record annual loss and has warned of a funding gap for an expansion program needed to prevent a repeat of the blackouts the country experienced in 2008. The company, which supplies about 95% of South Africa's electricity and more than 60% of Africa's, reported a loss of 9.7 billion rand (US$ 1.25 billion) for the year that ended 31 March. In the previous year, Eskom made a loss of 210 million rand (US$ 27 million).

(694.5971) WISE Amsterdam - The utility foresees a funding shortage of some 80 billion rand (US$ 10 billion) for its expansion program aimed at reducing the risk of power shortages. In January 2008, as domestic supply reached its limit, South Africa suffered crippling blackouts and electricity exports to neighbouring Botswana and Zimbabwe were stopped. This led to a wider grid failure affecting Zambia.

In August 2009, Bobby Godsell, chair of the utility, noted, "We need to mobilize greater equity resources to fund the build program. The government has already provided 60 billion rand (US$ 8 billion) in a loan with equity characteristics. Government revenues are likely to be severely constrained in the near future. We need to find other sources of expansion funding, perhaps in the form of a development bond that will enable South Africans to invest in the expansion of our country's energy system."

"The capital costs of our build program have escalated considerably," Godsell added.

"Prior to the recent global economic crisis, construction costs were escalating worldwide and across all industries. The global recession has created new market circumstances."

And the nuclear program?

In early 2007, Eskom's board approved a plan to boost electricity output to 80 GWe by 2025. This included the construction of 20 GWe of new nuclear capacity, which would see the contribution of nuclear energy grow to 25% from the present 5%. The plan for the nuclear new-build program would kick-start with up to 4 GWe of pressurized water reactor (PWR) capacity, to be constructed from about 2010 with commissioning in 2016. Five sites in the Cape Province were under consideration, although the most likely initial site (Nuclear-1) would be that of Koeberg, the site of South Africa's only existing nuclear power plant. The Nuclear-1 project was established after the very ambitious scenario for development and construction of the Pebble Bed Modular Reactor (PBMR) failed to meet even the most modest time schedule.

Having already made "considerable progress" in the process to procure a PWR, Eskoms board of directors decided in December 2008 not to proceed with the project due to 'the magnitude of the investment'; the companies own financial constraints and the global economic situation. The investment was increasingly impossible to justify, with a plunging rand, global

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lines of credit frozen, and a new government with potentially different priorities.

On September 11, addressing the World Nuclear Association Annual Symposium in London, UK, Jaco Kriek, CEO of the PBMR company, said that South Africa's pebble bed modular reactor (PBMR) Demonstration Power Plant (DPP) project has been indefinitely postponed due to financing constraints. He said the PBMR company has had to adopt a new business model "to reduce the funding obligations on the South African government."

Sources: World Nuclear News, 28 August 2009 / Nuclear Monitor 681, 16 December 2008: 'Eskom cancels PWRs; major blow to nuclear expansion' / World Nuclear News, 11 September 2009

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U.S.A.: INDUSTRY EFFORTS TO OVERTURN STATE BANS ON NEW NUCLEAR REACTORS FAIL

The so-called "nuclear renaissance" is finding few friends among state lawmakers in the United States. The nuclear power industry has been shut out across the board in 2009 in its efforts in all six states -- ranging across the nation from Kentucky to Minnesota to Hawaii -- where it sought to overturn what are either explicit or effectively bans on construction of new reactors, according to the Washington based Nuclear Information and Resource Service (NIRS). Efforts to overturn bans also have failed to advance in Illinois and West Virginia and Wisconsin.

(694.5972) NIRS Washington - Beyond failing to reverse a single state-level ban on new reactors, the industry also suffered a wide range of major defeats, including an effort to repeal a ban on "Construction Work in Progress" (CWIP) payments that would have been imposed on Missouri ratepayers to finance a new nuclear power plant, which was then promptly mothballed. Industry efforts to get nuclear declared "renewable" by the states of Indiana and Arizona also failed to achieve results. Also going nowhere is a California bill to lift the state's pioneering law banning new reactors until a high-level waste dump is in place. That follows a 2008 California statewide referendum drive with the same focus that failed for lack of sufficient signatures to get it on the ballot.

Michael Mariotte, executive director, NIRS, said: "While the nuclear power industry and a few members of Congress claim the U.S. is on the verge of a nuclear power resurgence, the industry looks more like a critical patient struggling to get by on life support out in the real world beyond the Beltway. No one seriously expects the industry to go away. But the truth is that things will be even tougher for their state lobbyists in 2010 now that the freeze on Yucca Mountain has taken long-term waste disposal off the table and also in the wake of new evidence of runaway construction costs that make nuclear power even more of a boondoggle."

Dave Kraft, director, Nuclear Energy Information Service, Chicago, IL., said: "Authorizing construction of new nuclear reactors without first constructing a radioactive waste disposal facility is like authorizing construction of a new Sear's Tower without bathrooms. Neither makes sense; both threaten public health and safety." Jennifer Nordstrom, Carbon-Free Nuclear-Free coordinator, Institute for Energy and Environmental Research, Madison, WI., said: "Telling states to build new nuclear plants to combat global warming is like telling a patient to smoke to lose weight: There are too many other serious downsides that cannot be ignored. Fortunately, it is both technically and economically feasible to go both carbon-free and nuclear-free by 2050. Here in Wisconsin, we have a carbon-free, nuclear-free coalition in support of Wisconsin's current law on nuclear power, and a 100 percent renewable Wisconsin."

Commenting on the defeat of an industry-sought CWIP repeal in the Missouri Legislature this year, Mark Haim, chair, Missourians for Safe Energy, Columbia, MO., said: "New nuclear plants are far too risky and expensive to attract investor funding. Utilities will only build them if they can transfer the risk to the taxpayers or their ratepayers. Here in Missouri AmerenUE attempted to repeal a voter-enacted state law that bans Construction Work in Progress charges. Their goal was to get the ratepayers to assume the risks. When our legislators heard from consumer, senior, low-income and industrial groups all opposing CWIP, the CWIP repeal went nowhere. Once Ameren realized they couldn't get CWIP, they announced that they were abandoning efforts to build a new nuclear reactor. The pattern is clear, investors find nuclear too risky and utilities will only go down the nuclear path if their customers or the taxpayers underwrite the project."

According to NIRS, the nuclear industry's 2009 defeats in 10 or more state capitols -- including all six efforts to overturn bans on new reactors (in Minnesota, West-Virginia, Wisconsin, Hawaii, Illinois, Kentucky) -- were offset by only one win. Georgia state lawmakers approved CWIP, empowering a subsidiary of the Atlanta-based Southern Co. to collect US$2 billion (Euro 1.37 billion) from its customers before a single watt of power is produced from two planned nuclear reactors. Outside of the South, CWIP bail-outs for the industry have made little headway to date.

Source: Press release, 27 August 2009
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POTENTIAL NUCLEAR NEWCOMER COUNTRIES

According to the World Nuclear Association's World Nuclear News, some 60 countries are considering the use of nuclear power, in addition to the 30 that already do so. The figure comes from the International Atomic Energy Agency (IAEA), which held a four-day workshop to develop tools to help those countries make the decision. It said that 20 of the states it is helping could have a program in place to use nuclear by 2030.

(694.5973) World Nuclear Industry Status Report 2009 - "Nuclear is a 100-year-long-commitment," said Yury Sokolov, who is in charge of the Nuclear Energy department of the IAEA. "A national energy policy should involve a proper assessment of a country's energy needs," and after that can a possible role for nuclear power be defined, if appropriate. Sokolov is then 'forgetting' the commitment for long-lived nuclear wastes, which is, too say the least, a bit longer than 100 years.

One key element in the IAEA's current toolkit for countries interested in nuclear energy is a book which details essential steps on the path to the use of nuclear power. Among them are the establishment of an independent expert safety regulator, an appropriate legislative framework and the development of a public debate on nuclear.

So, what is the reality of these plans? In August, the World Nuclear Industry Status Report 2009 (written by M. Schneider, S. Thomas, A. Froggatt, D. Koplow) was published. Main conclusion of the report is that a nuclear 'renaissance' is not happening. Part of the report is a more detailed look to potential newcomer countries.

Between 2006 and 2008 alone, the IAEA has received requests for technical cooperation from some 43 Member States. The IAEA accounts for the introduction of nuclear power in 20 new countries by 2030 in its high projection and on five newcomer countries in its low projection. As detailed in the following table, not all countries that ask for assistance are actually planning to introduce nuclear power plants. Rather, the IAEA notes that some are merely "interested in considering the issues associated with a nuclear power programme".

Only one newcomer country, **Iran**, is already in the course of building a nuclear power plant.

France has been particularly active in negotiating new nuclear trade or cooperation agreements with potential newcomer countries. According to Philippe Pallier, director of the newly created Agence France Nucléaire International (AFNI), France received requests by "several tens of countries" for assistance to implement a civil nuclear power program. Agreements were signed or are under negotiation in particular in North Africa and in the Middle East, including **Algeria**, **Jordan**, **Libya**, **Morocco**, **Tunisia** and the **United Arab Emirates**. In addition, interest in nuclear energy has been demonstrated by **Egypt**, **Israel**, **Jordan**, **Kuwait**, **Qatar**, **Syria**, and **Yemen**. The US government has signed a nuclear agreement with the **United Arab Emirates** and memoranda of understanding on nuclear cooperation with **Saudi Arabia** and **Bahrain**.

Jordan has set up a Committee for Nuclear Strategy and received initial proposals by KEPCO (South Korea), AREVA, Atomstroyexport and AECL (Canada). Construction is projected to start as early as 2012.

In Asia potential candidates for French atomic help include **Thailand** and **Vietnam**. China, Russia and South-Korea are said to have offered assistance to **Bangladesh** to build a nuclear power plant, a "46-year old plan", the *Financial Express* notes.

In Europe **Albania** and **Croatia** are discussing the possibility of building a joint nuclear plant. **Montenegro** and **Bosnia** have been invited to join the project. The Italian utility ENEL is said to have evaluated the feasibility of the project.

Portugal is said to be reviewing a nuclear project that could serve Spain as well. However, in the past the government has rejected nuclear proposals and Spain has currently a firm nuclear phase out policy.

Lithuania invited **Poland**, **Estonia** and **Latvia** to build a joint "Baltic" nuclear plant to replace the remaining second

Table 1: Positions of Potential Nuclear Newcomer Countries.

Definition of group	Number of Countries
Not planning to introduce nuclear power plants, but interested in considering the issues associated with a nuclear power program.	16
Considering a nuclear program to meet identified energy needs with a strong indication of intention to proceed.	14
Active preparation for a possible nuclear power program with no final decision.	7
Decided to introduce nuclear power and started preparing the appropriate infrastructure.	7
Invitation to bid to supply a nuclear power plant prepared.	1
New nuclear power plant ordered.	-
New nuclear power plant under construction.	1

Ignalina reactor that will be shut down by the end of 2009 according the country's EU accession agreement. However, even after the shutdown of Ignalina, power consumption in the other countries would not justify the construction of a large nuclear plant. Financing is also a major issue.

Belarus, the country that was worst hit by the Chernobyl disaster in 1986, has received offers for a nuclear plant from Atomstroyexport, AREVA and Westinghouse.

Of 38 potential nuclear newcomer countries listed by the World Nuclear Association, 15 don't have nuclear experience on research-reactor level (considered as one of the prerequisites for the operation of a commercial plant) and 20 have an electricity grid that is smaller than 10,000 MW (considered by the IAEA as the minimum grid capacity to add an additional large unit - 1000MW or 10%- of any type in order to prevent grid interface problems). Seventeen countries have both research-reactor experience and larger than 10,000 MW grids.

What are the prospects of a nuclear power program in these countries?

Australia is a large uranium producer but the introduction of nuclear power always faced significant controversy. A December 2006 report to the Prime Minister, the Switkowski Report, suggested the rapid introduction of a nuclear power program in the country. An international panel of experts, including three of the authors of this report, concluded that the Switkowski Report was highly biased and that the targets were unrealistic. Nothing has happened since. Any significant follow-up over the coming 20 years in industrial terms is highly unlikely. Switkowski acknowledged in March 2009 that once the people accepted nuclear power "it would be at least another 15 years before a reactor could be built". In fact, the newly elected Australian government will put that timeframe even further away. As Martin Ferguson, Minister for Resources and Energy has recently restated, "the Government has a clear policy of prohibiting the development of an Australian nuclear power industry".

It has been reported that in November 2007 the **Chilean** President asked the Energy Minister to look into the nuclear power option. A modest effort seems ongoing, as in 2009 the government allocated CP$430 million (US$665,000) to study nuclear power. Even such a minor expenditure raised significant criticism by the environmental community in the country. There are no short or medium term prospects for a nuclear power program.

In **Egypt** it is already 35 years since the first nuclear power plant was proposed. The plan never materialized. More recently Egypt signed nuclear cooperation agreements with Russia and China. In December 2008 the government announced that it had selected the US company Bechtel (later transferred to Worley Parsons) to provide assistance in selecting a reactor provider and to train staff. A 1,000 MW plant is planned to start up by 2017.

Nuclear power projects in **Indonesia** have a 20-year history. In 1989 the National Atomic Energy Agency (BATAN) carried out the first studies. In 2007 the Korea Electric Power Corp (KEPCO) agreed to develop a new feasibility study for two 1,000 MW reactors. Cooperation agreements were also signed with Japan and Russia. Indonesia's Minister for Research and Technology was quoted in March 2008 as stating that the country would need four 1,200 MW units by 2025 and that the first one was to go online by 2016. Construction would have to start in 2008. "Otherwise, we will be behind schedule", he stated. Indonesia will be behind schedule. No call for tender has been announced yet. The nuclear plans have raised concerns and protests because of intense volcanic and earthquake activities in the areas envisaged to host a plant, in particular in Central Java. There is little prospect for near or medium term nuclear power plant operation and no target dates have been announced.

Israel has developed a full-scale nuclear weapons program and thus has strong nuclear capabilities. Several arguments speak against a short and medium term nuclear power program in the country. With a grid size of just 10,000 MW a nuclear plant would be clearly oversized. The country has not signed the Nuclear Non-Proliferation Treaty and is therefore technically isolated. Nuclear power plants are sometimes called pre-deployed nuclear weapons. There are few places where this perspective seems more pertinent than in the case of Israel. And finally, Israel is a major player in the renewable energy sector. An Israeli company currently plans to construct in California the world's largest solar project, a 1,300 MW plant. A similar project with 500 MW will be started up by 2012 in Israel.

The Berlusconi Government has introduced legislation that would pave the way for the reintroduction of nuclear power in **Italy**. Four EPRs could be built with construction starting as early as 2013, under an agreement signed in February 2009 by the French utility EDF and the largest Italian utility ENEL. However, Italy is the only country that shut down its nuclear program after the Chernobyl accident in 1986 and a referendum in 1987 reinforced the decision. Four operational reactors and four units under construction were abandoned and no nuclear electricity was generated after 1987. Twenty years later, Italy continues to face significant decommissioning and waste management costs. There is no final repository for high-level waste and the public remains hostile. Italy had built up a significant nuclear industry and still has a strong nuclear lobby. More recently ENEL announced investments in nuclear plants outside the country, in particular in the Slovak Mochovce plant and the French Flamanville-3 unit. This strategy seems much more realistic than any short or medium term revival of nuclear power in Italy itself.

Kuwait announced plans in March 2009 to set up a national nuclear energy commission and has introduced draft legislation to achieve this. The country is in the very early stages of designing a possible nuclear power policy. With only 11,000 MW, its grid is very small. Applications in the short and medium term are unlikely.

The Indian nuclear industry has stated that it would be ready to assist

Malaysia in developing a nuclear power program "if there is a genuine interest, as nuclear power production is a long term commitment". There are no short or medium term perspectives or ambitions.

In **Norway** a government appointed committee recommended in February 2008 that "the potential contribution of nuclear energy to a sustainable energy future should be recognized." However, as the OECD's Nuclear Energy Agency's Norway country profile states: "Norway does not have a nuclear power generation programme."

The **Philippines** abandoned a nuclear power project in the past. A 600 MW Westinghouse reactor, Bataan-1, was ordered in 1974 and building started in 1976. The nearly complete project was abandoned by the incoming Aquino government days after the Chernobyl accident in 1986. However, payments apparently continued until 2007. In February 2008 the IAEA visited the site at the request of the Philippine government. There have been successive attempts from Members of Congress to introduce bills mandating the rehabilitation of the plan, the latest in December 2008. "The government has to assess what the new licensing requirements should be, how to modernize the two-decades old technology to current standards, and how to confirm that all aspects of the plant will function properly and safely. It is not the IAEA´s role to state whether the plant is usable or not, or how much it will cost to rehabilitate", the IAEA stated. The power plant site is close to an earthquake prone zone and the dormant Pinatubo volcano. Considering the disastrous experience with the initial investment, the absence of an appropriate nuclear framework (legislation, safety authorities, etc.) and significant opposition against the project in the country, it seems unlikely to go ahead.

Poland ordered five Russian designed reactors between 1974 and 1982. Work started on two units at Zarnowiec but all orders were officially cancelled by 1990. The current Polish government has revived the nuclear plans and stated that a first reactor should be operational by 2020. The state owned power utility PGE announced plans in January 2009 to build two 3,000 MW plants in the country. In addition, Poland has joined the Lithuanian Energy Organisation (LEO) alongside Latvia, Estonia and Lithuania with the project of a "Baltic plant" in a Visaginas called project. Originally a new plant replacing the Ignalina plant, which will close by the end of 2009, was planned to start up as early as 2015. No new realistic time frame nor financing schemes are available. No call for tender has been issued.

In **Portugal** "in 2004 the government rejected a proposal to introduce nuclear power but this is now being reviewed", writes the WNA. However, Portuguese public opinion is overwhelmingly opposed to nuclear power and there are no plans. As the OECD's Nuclear Energy Agency's Portugal country profile states: "Portugal does not have a nuclear power generation programme."

In **Thailand** there have been nuclear power plans since the 1970s, none of which ever materialized. Under the previous government, the energy minister revived plans for the construction of four nuclear reactors with a total of 4,000 MW coming online by 2020-2021. However, the incoming government has not reiterated any of these plans.

While the IAEA does not identify the countries in the various categories in Table 1, it is clear that **Turkey** is the only potential newcomer country that has already launched a call for tender. But in September 2008 it had received only one offer, by the Russian Atomstroyexport (ASE), amongst the six potential bidders. In principle, the procedure had to go back to the starting point, since Turkish law does not allow for the attribution of such a contract if there is only one bidder. However, negotiations have been continuing around the offer from the Russian consortium, which includes ASE, Inter RAO UES and the Turkish company Park Teknik. The bid, based on the BOO (Build-Own-Operate) model, covers the construction of four 1200 MWe AES-2006 VVER reactors to be built near Mersin in the Akkuyu district. In February 2009 the project was subject to discussions between the Russian and Turkish presidents. Financing of the project remains a key problem. It has been reported that the initial Russian offer was to sell the power from the to-bebuilt plant at a price that would represent more than three times the current wholesale power price in Turkey. A revised offer would still be more than double current wholesale levels. However,
Akkuyu was the location of an earlier abandoned nuclear project that was based on a 100% prefinancing scheme and still failed. Turkey lacked, and continues to lack, consistent nuclear infrastructure and the project received fierce opposition by the local population. The latest proposal only revived the local protests.

The **United Arab Emirates (UAE)**, following recommendations by the IAEA, set up a Nuclear Energy Program Implementation Organization (NEPIO) and the Emirates Nuclear Energy Corporation (ENEC) as a public entity with initial funding of US$ 100 million; and it has initiated steps to develop nuclear legislation. The move is following a government position paper on the "Evaluation and Potential Development of Peaceful Nuclear Energy". By 2020, the Emirates envisages operating three 1,500 MW units, but no decision was taken as of middle of May 2009. Although the UAE has signed a far-reaching nuclear cooperation agreement with France, there is strong resistance in the US Congress to the implementation of a similar agreement signed by the previous US administration at the very end of its term on 15 January 2009. "Given the UAE's past history as the major transshipment point for goods destined for Iran's nuclear and missile programs, serious concerns remain about its eligibility for a nuclear cooperation agreement with the U.S.", stated Congresswoman Ileana Ros-Lehtinen, the ranking Republican member of the House Foreign Affairs Committee. The strong bi-partisan opposition in the USA could seriously hamper any attempts by the UAE to go ahead with a nuclear power program, even if President Obama has officially authorized implementation. Also, the UAE would have to very substantially increase overall installed capacity and

the grid, since a single 1,500 MW plant corresponds to about 10% of the currently installed capacity.

Venezuela passed a decree "on Development of the Nuclear Industry" as early as 1975, but never did develop a nuclear power program. In September 2008 President Chavez was quoted as saying "we certainly are interested in developing nuclear energy, for peaceful ends of course - for medical purposes and to generate electricity". Russia and France have offered assistance in building up a nuclear program in Venezuela. However, apparently there are no concrete decisions or plans yet.

In 1996 **Vietnam** signed an agreement with South Korea for "Cooperation in Research into the Peaceful Uses of Nuclear Energy". Later cooperation agreements were also signed with other countries including Canada, China, France, Japan and Russia. In mid 2008 a nuclear law was passed with the view of constructing two 1,000 MW units starting in 2014 with a targeted grid connection of 2018. Vietnam is lacking general nuclear infrastructure and would have to invest considerably in grid expansion in order to absorb the production of the two units that represent almost 20% of the currently installed capacity.

Conclusion
It remains unlikely that any of the potential new nuclear countries can implement fission power programs any time soon within an appropriate technical, political, legal and economic framework. None of the potential newcomer countries have proper nuclear regulations, an independent regulator, domestic maintenance capacity and the skilled workforce in place to run a nuclear plant.

The head of the French Nuclear Safety Authority has estimated it would take at least 15 years to build up the necessary regulatory framework in countries that are starting from scratch. Furthermore, few countries have sufficient grid capacity to absorb the output of a large nuclear plant. This means that the economic challenge of financing a nuclear plant would be exacerbated by the large ancillary investments in the distribution network that would be required.

The countries that have a grid size and quality that could apparently cope with a large nuclear plant in the short and medium term encounter other significant barriers: a hostile or passive government (Australia, Norway, Malaysia, Thailand), an essentially hostile public opinion (Italy, Turkey), international non-proliferation concerns (Egypt, Israel), major economic concerns (Poland), a hostile environment due to earthquake and volcanic risks (Indonesia), lack of all necessary infrastructure (Venezuela). Many countries face several of these barriers at the same time.

The report World Nuclear Industry Status 2009, Commissioned by the German Federal Ministry of Environment, Nature Conservation and Reactor Safety and published in August 2009, is very interesting reading. It can be found at:
http://www.bmu.de/english/nuclear_safety/downloads/doc/44832.php

Sources: World Nuclear news, 27 July 2009 / World Nuclear Industry Status Report 2009, Mycle Schneider, Steve Thomas, Antony Froggatt, Doug Koplow

Contact: WISE Amsterdam

GEOLOGY AND NUCLEAR WASTE IN FINLAND

The issue of final disposal of used nuclear fuel has not yet been resolved. Use of nuclear power includes a difficult moral question: do we have the right to make use of uranium resources and just leave the resulting waste for the next thousands of generations to worry about? Finland, together with Sweden, are internationally often seen as countries close to a final disposal facility.

(694.5974) Finnish Association for Nature Conservation - In Finland, the legislation now forbids the export of nuclear waste. The plan is to use bedrock of Olkiluoto - site next to a nuclear plant - for final disposal. On this process, the key issue is the long-term safety. Spent nuclear fuel is maybe the most dangerous material which exists. There is not a permission to build or use an end-disposal site anywhere, the Finnish company Posiva has only a test-permit at the moment. Several years of research are still needed before even an application of the final disposal site can be posted.

Bedrock in Olkiluoto is full of cracks, because of the location. During a future ice-age, as it did in the past, the glaciers extend fully in top of Olkiluoto island. This creates heavy earthquakes, rifts and cracks to the bedrock. Mostly this site was choosen because of political reasons, it is next to a nuclear power plant and the local people are not so much against the final disposal site. There were other candidates also, but those created a lot of local resistance.

A survey commissioned by the STUK - the Finnish Radiation and Nuclear Safety Authority - has estimated the long-term safety of the Posiva project. According to this survey by professor in geology Matti Saarnisto, long-term safety of the final disposal site is speculative and is not based on scientific facts. Professor Saarnisto has been a research professor at the Finnish Geological Survey and the Secretary General at the Finnish Academy of sciences.

First of all, the depth to which permafrost can extend during an ice age has been incorrectly estimated. Permafrost can cause massive pressure on the end-disposal capsules and crack them. Posivas estimates the depth of the permafrost a bit over 180 meters. According to professor Saarnisto, the same kind of mathematical models have been used in Canada and the result have been about 700 meters. One can ask, why Posiva doesn't plan to put the final disposal site deeper, f.e.800 meters? Answer can be, that the structure of the

bedrock on that depth is so inconvenient that the implementation is very expensive or even impossible.

The reversibility and monitoring of nuclear waste are impossible to realize, as the nuclear waste site will be either partially or wholly submerged in water or continental ice for most of the timeframe being examined. Long-term safety for the site means several hundreds of thousands of years. Professor Saarnisto wrote: 'somewhere in the next 120 000 the depository will be covered by a continental glacier of the Baltic basin waters for some 40 000 years without any possibility to control it'. The controllability and reversibility is anyway needed - if something goes wrong, the nuclear waste capsules need to be returned to the surface.

The prediction of earthquake occurrences is inadequate, according to professor Saarnisto. Huge downward and upward movements of the bedrock are one of the main risks of the depository, together with glacial loadings and permafrost. Posivas report of long-term safety does not deal with these issues properly. Posiva notes that a single breakup of a capsule wouldn't have environmental effects, but this position is presented without arguments.

Several depository sites all over the world have run into serious trouble and the projects have been terminated. What to do with the nuclear waste if end disposal in bedrock seems to be impossible to operate? First of all, we should stop producing more of it..

Further reading:

- 1: 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.
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- 2: Matti Saarnisto 2008: Evaluation report on the Posiva report 2006-5. Radiation and Nuclear Safety Authority(STUK). available on demand from STUK.
- 3: Posiva (2008): Expansion of the Repository for Spent Nuclear Fuel. Environmental Impact Assessment Report.
http://www.posiva.fi/publications/Posiva_YVA_selostusraportti_en_lukittu.pdf.
- 4: Expected Evolution of a Spent Nuclear Fuel Repository at Olkiluoto (Revised October 2007) December 2006, Posiva.
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Source and contact: Janne Björklund, nuclear campaign coordinator, Finnish Association for Nature Conservation
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GORLEBEN REVELATIONS AND ELECTIONS SPARKS ANTI-NUCLEAR REVIVAL

On September 5, some 50,000 people marched in the German capital Berlin, in a demonstration against nuclear energy. It was the largest anti-nuclear demonstration in Germany since 1986, when in the months after Chernobyl hundred-thousands of people took the streets. The demonstration was meant as a warning to politicians that anti-nuclear sentiment is still strong and people will engage against any attempt to flaw the phase-out of nuclear power in Germany after the general elections on September 27.

(694.5975) WISE Amsterdam - The protest was initiated by local groups from the Wendland, the region in Germany where Gorleben is situated. Gorleben was designated in the 1970's to be location where the countries nuclear waste will be disposed of in salt mines.

Meanwhile, more and more becomes known over the last few months about how Gorleben was selected.

Gerd Luettig, a retired geology professor involved in the 1970s search for a salt deposit to be made a nuclear dump, claimed that a West German provincial leader placed a nuclear waste dump near the border with communist East Germany out of revenge for the East Germans doing the same on their side of the border. In early August 2009, Luettig told ddp news agency that is how Gorleben came to be chosen in 1977 by the then Conservative premier of Lower Saxony state, Ernst Albrecht. Out of 100 salt deposits investigated, all of them in northern Germany, Gorleben was in the final shortlist of eight. The Federal government identified three promising sites, all in Lower Saxony. Gorleben was not among them. After opposition from state officials of Lower Saxony, the federal government let them choose its own site.

Lüttig says Albrecht wanted a location near the border because the East Germans "got us into hot water with their final repository at Morsleben". Gorleben and Morsleben are about 95 kilometers

More plutonium in Asse II research mine. There is more than twice the amount of plutonium stored at the Asse waste dump in Germany than previously estimated. Ministers said there was 28 kilograms of plutonium in the Asse II dump, not the nine kilograms previously estimated by operators Helmholtz. The Federal Office for Radiation Protection took over operation of the facility earlier this year after unauthorised material was found there. Low- and intermediate level nuclear waste was deposited at the Asse Research mine in the 60s and 70s for research purposes. These experiments have been terminated, but the waste remains in the pit. Brine influx into the allegedly stable and dry repository was known even when the deposition began.
Bloomberg, 29 August 2009 / Nuclear Heritage Information leaflet

apart. Both villages were close to the border that separated the two Germanies.

Lüttig says West German geologists and Albrecht's state government knew from talks with East German geologists, that the Morsleben former salt mine "was technically defective" and water was flowing into it. "We always feared - and that enraged Mr Albrecht - that one day Morsleben would be flooded and radioactively polluted water could flow towards Helmstedt", then the crossover point at the border, "and despoil a whole landscape there".
Thereupon the premier had declared, "then we'll do the same", Lüttig says. "In further talks Albrecht gathered arguments. He said the county was after all thinly populated and its council had asked him to do something there and that it would benefit the county. Albrecht focussed on that more and more." Lüttig said he and his team had found Gorleben "barely suitable" and only named it "because it's a relatively large salt deposit."

Later in August, it emerged that the former Federal government of Chancellor Helmut Kohl had brushed over scientific objections to the project in the 1980s. A report by the Frankfurter Rundschau newspaper claimed that the Kohl government had "sugarcoated" an experts' report saying that the underground Gorleben Salt Dome in Lower Saxony was not in fact suitable for long-term storage of dangerous nuclear waste. The newspaper report said that in 1983 the Kohl cabinet put pressure on the scientists advising the government on the options for nuclear-waste storage to approve the Gorleben site, and had then paraphrased their report making it appear more positive, apparently in an effort to save money. The scientific objections to the Gorleben site centred on the concern that the sediment around the salt-cave is not strong enough to prevent the escape of radiation.

One day after the revelations, on August 26, 2009, Environment Minister Sigmar Gabriel said that the salt dome Gorleben "is dead." Gabriel said: "Under those circumstances, research (at Gorleben) can't be continued." Germany's Federal Office for Radiation Protection backed the minister. A spokesman of the office told the Frankfurter Rundschau that the start of the Gorleben project "has many birth defects that are not compatible with today's open and transparent policies and is therefore controversial".

German Chancellor Angela Merkel's conservatives Christian-Democrats want to continue pursuing Gorleben, while the Social Democrats are in favor of looking for additional, potentially more promising locations. The Conservatives dislike that plan because most of the alternative candidates are located in states dominated by party colleagues

Despite some 1.5 billion euros (US$ 2 billion) having been spent on research there since 1979 the site has however never become operational for long-term waste storage. Because of the massive public protests, the German government in 2000 stopped researching Gorleben, but that moratorium expires in October 2010 at the latest.

In the September 27, 2009, general elections the phase-out of nuclear power is an important issue. A continuation of the ruling yellow-red government (Christian-Democrats and Social Democrats) is likely to hold on to the planned phase-out (which will lead to the closure of 7 nuclear reactors in the next 3 years.) A pro-nuclear yellow-black coalition (Christian-Democrats and Liberals, favored by chancellor Merkel), was leading in the polls, but over the last few weeks the lead disappeared, and the outcome is very much unsure. A yellow-black coalition will most likely suspend the phase-out but is not in favor of new build.

On the website *http://www.ausgestrahlt.de/aktionen/anti-atom-demo-59/berichte.html* you can find many press reviews of the September 5 demonstration. Scroll down to find international media.

Sources: www.Indymedia.de, 8 August 2009 / EarthTimes, 25 August 2009 / UPI, 26 August 2009

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Invitation

Nuclear Waste Problems - from Mining to Reactor Waste

International Conference, 17-18 Oct. 2009, Stockholm, Sweden

➟

International speakers will give presentations about issues as

- Which consequences does radiation has on the biologic diversity?
- Is deep underground disposal the solution for radioactive waste?
- Does a nuclear power station during 'normal' operation emits radiation? If so, how much?

The conference is in English. Costs are 55 euro per person, including refreshments and lunch. Travel and accomodation are at own costs.

17 October:

- ASSE II - A Notorious Nuclear Repository in Germany
- Depleted Uranium (DU) in Weapons - Action group against Radioactive Warfare, Sweden
- Radioactive Emissions into Air from Nuclear Reactors - Dr. Ian Fairlie, UK
- Medical Effects of Radiation - Ulla Slama, Physician, Finland
- Male Supremacy in the Nuclear Industry - Ewa Larsson, Green Women, Sweden
- Uranium: not only mining - Professor Gordon Edwards, Canada

Workshop 1: International cooperation in the environmental movement on radioactive waste issues.
Workshop 2: Uranium mining and Indigenous Peoples.
Workshop 3: Health effects of radiation.
Workshop 4: Other aspects of nuclear waste.
Report from the working groups, discussion and summary

18 October:

- Swedish Final Repository for Low and Medium Level Nuclear Waste (SFR), Lars-Olof Höglund, Nuclear Engineer, Sweden
- Central Interim Storage Facility for Spent Nuclear Fuel (CLAB), Roland Davidsson, National Organisation of Energy Associations (SERO), Sweden
- High Level Nuclear Waste and the European Pressurized Reactor, Lauri Myllyvirta, Greenpeace, Finland
- Nuclear Waste in the UK, Dr. David Lowry, UK
- High Level Nuclear Waste & Very Deep Boreholes, Dr. Johan Swahn, The Swedish NGO Office for Nuclear Waste Review (MKG), Sweden
- High Level Nuclear Waste & The Dry Rock Deposit Method, Dr. Nils-Axel Mörner, Sweden
- Nuclear Waste in Russia - Andrey Ozharovskiy, Ecodefence, Moscow
- Problems and Financing of Nuclear Waste in Japan, Dr. Göran Bryntse, Sweden
- Nuclear Future - Ulla Klötzer, Finland
- Press conference / coffee and tea
- Panel discussion

☞ Please, register at: http://www.nonuclear.se/register
The registration deadline is 6 October 2009

IN BRIEF

ElBaradei: Threat Iran 'hyped'. On September 14, the 53rd IAEA General Conference confirmed the appointment of Mr. Yukiya Amano of Japan, a Japanese career diplomat, as the next IAEA Director General. Mr. Amano assumes office on 1 December 2009, succeeding Dr. Mohamed ElBaradei to the Agency´s top post. His appointment is for a term of 4 years - until November 2013.
Meanwhile, in an interview with The Bulletin Of Atomic Scientists, Elbaradei stated that there is no concrete evidence that Iran has an ongoing nuclear weapons program. "But somehow, many people are talking about how Iran's nuclear program is the greatest threat to the world. In many ways, I think the threat has been hyped." ElBaradei said there was concern about Iran's future nuclear intentions and that Iran needs to be more transparent. "But the idea that we'll wake up tomorrow and Iran will have a nuclear weapon is an idea that isn't supported by the facts as we have seen them so far," said ElBaradei.
Bulletin of Atomic Scientists, 24 August 2009 / IAEA, 14 September 2009

France: charges dropped for publishing document. The public prosecutor in Paris has decided not to press charges against Stephane Lhomme, the spokesperson for the anti-nuclear Sortir du Nucleaire organization. Lhomme had been under investigation since 2006 for breach of national security in connection with the publication of a classified document acknowledging weaknesses in the EPR reactor design's ability to withstand the crash of a commercial jetliner. After he was arrested many organizations published the documents on their website. 30,000 People, several of them wellknown political figures, intellectuals, writers and artists, signed a petition demanding the case to be closed.
Lhomme revealed in 2006 that he was in possession of an internal Electricite de France document, stamped "defense confidential," that acknowledged weaknesses in the EPR's resistance to an aircraft crash, a major issue after the terrorist attacks with airplanes in the US on September 11, 2001. The revelation came during public inquiry and licensing proceedings for EDF's first EPR unit, Flamanville-3. Lhomme was charged with endangering national security by revealing the contents of a classified document.
Nucleonics Week, 27 August 2009

SE tries to stifle opposition. Plans by Slovak utility Slovenske Elektrarne (SE) to stifle opposition to its contested Mochvoce 3, 4 nuclear power reactors have mistakenly been leaked to Greenpeace. The leaked documents show that SE, which is jointly owned by Italian energy giant ENEL and the Slovak State, intends to manipulate public hearings on the environmental impact assessment for the project which involves the construction of two new Soviet-era reactors. The documents also mention strategies to "prevent [a] public hearing in Vienna", "reach the lowest possible media & public attention" and "avoid antinuc [sic] unrests [sic]". "These tactics are more akin to communist era manipulation and show that the Mochovce nuclear project is in dire straits," said Jan Haverkamp, Greenpeace EU dirty energy policy officer.
Construction of the Mochvoce 3,4 nuclear reactors started in the 1980s but was halted after the velvet revolution. After privatization of state utility SE to the Italian electricity giant ENEL, the Slovak government demanded from ENEL to finish the project. Because the reactors are from a 1970 Russian design and much of the civil construction already has happened in the 1980s, it is not possible to replace it with a modern design. As a result, the safety level of these nuclear reactors is lower than what is currently considered appropriate, especially after the 9/11 attacks.
Greenpeace 11 September 2009

US enrichment plant denied loan guarantee, or not? US enrichment company USEC is preparing to 'demobilize' - or cancel - its partially built uranium enrichment plant after the US Department of Energy (DoE) denied its application for a loan guarantee in July. As mentioned in the July 16 Nuclear Monitor In Briefs, loan guarantee from the Department of Energy was essential for continued construction. The American Centrifuge Plant is mid-construction at Piketon, Ohio. The US Nuclear Regulatory Commission (NRC) granted a construction and operation license for the plant in April 2007. The plant had been scheduled for commercial operation in 2010, but financing for the plant has long been a concern and earlier this year USEC announced that it was slowing the plant's schedule pending a decision on the DoE loan guarantee. The company applied for loan guarantees amounting to US$2 billion (Euro 1.37 billion) in July 2008. After the DoE decision in late July, however, the company said it is initiating steps to demobilize the project in which it has already invested US$1.5 billion.
Two weeks later, in a surprising announcement, the Department of Energy said it has agreed to postpone by six months a final review of USEC's loan guarantee application for the American Centrifuge Plant in Piketon, Ohio. The additional time will allow USEC to address financial and technical concerns about its application that caused the DoE to deny the loan guarantee.
Sources: World Nuclear News, 28 July & 5 Augusts 2009

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.

Receiving the WISE/NIRS Nuclear Monitor

US and Canada based readers should contact NIRS for details of how to receive the Nuclear Monitor (address see page 11). Others receive the Nuclear Monitor through WISE Amsterdam.
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Nuclear Monitor needs more contributors

The Nuclear Monitor exists for more than three decades already. In 1978 the first issue was produced, although it was called "The WISE News Communiqué" at that time.

Since 1978 many things have changed, but to produce 20 issues of the magazine annually is still a struggle. And equally important for that matter. Our readers (you) value both quality and quantity.

The Nuclear Monitor is produced by a very small group of people. We do not pay for articles being written for us, we never did and it's hard to imagine we ever will. But that small group is looking for some help.

In short: we are looking for people, especially in Asia and Africa, but also in Australia and the America's, who are willing to write about local and regional developments concerning (anti-) nuclear issues.

We think that currently the content of the magazine leans too much on West-European sources and contributors. To have a more balanced and global perspective, we need people with knowledge of, and access to, non-English and/or non-German sources and background. There are so many things we are not aware of, even in this digital highway day and age. It is simply not enough to read all the wires from the big agencies, we want the stories from the ground, the grassroots fighting the nuclear industry, the reports of actions and campaigns, the incidents and accidents that not make it to the mainstream media, the analysis no-one wants to make because they are 'too difficult'

So, if you want to contribute - be it regularly or sporadic- to the Nuclear Monitor, or want to become more involved in the (production) of the magazine please contact WISE-Amsterdam at wiseamster@antenna.nl

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