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THE PROLIFERATION RISKS OF ITER

The decision regarding where the new International Thermonuclear Experimental Reactor (ITER) will be located, Cadarache (France) or Rokkasho Mura (Japan) is expected to be resolved when ITER partners meet (at a yet unknown date). Dr. Andre Gsponer and Dr. Jean-Pierre Hurni, director and senior researcher at the Swiss based Independent Scientific Research Institute (ISRI), have published a report on the proliferation aspects of ITER and fusion research.

(603.5574) WISE Amsterdam – There are several valid arguments against the construction of the ITER reactor and continued research into fusion energy; tremendous costs, safety risks, radioactive waste to name a few. The ISRI researchers focussed on the strategic-political and military-technical implications of the fusion research and reviewed two aspects of the proliferation risk: the availability of tritium, which can be used both in fusion reactors and nuclear weapons, and scientific knowledge on fusion physics.

Tritium and nuclear weapons

The oldest design for nuclear weapons consists of pure high-enriched uranium and/or plutonium materials. The Nagasaki bomb for instance contained 6 kilograms of plutonium and 120 kilograms of uranium; to compress the materials and start the chain reaction, 2,500 kilograms of high explosives surrounds the nuclear core making the bomb large (1.3 meters), heavy (about 3,000 kilograms) and deliverable by airplane only.

“Boosting” technology has made it possible to decrease the weight and size of a weapon. Its core materials remain the same but prior to detonation, the center is injected with a mixture of deuterium-tritium gas. Compressed by chemical explosives, an initial chain reaction begins with subsequent X-rays and neutrons heating the gas at the center. The pressure and temperature of the gas is sufficient to start the fusion reaction, the mixture rapidly burns out generating an intense pulse of neutrons. These fusion neutrons cause the rest of the core to fission, which generates most of the yield of the explosion.

In “boosted” bombs, fusion is used to produce neutrons for fission making them very different from powerful “hydrogen” or “thermonuclear” bombs where fusion itself is more important and causes the main yield.

A few grams of tritium are sufficient to “boost” bombs made of a few kilograms of military- or reactor-grade plutonium making them smaller and

lighter than conventional designs and deliverable by missiles instead of bomber planes. “Boosted” bombs contain only 4 kilograms of plutonium or 12 kilograms high enriched uranium, weighs less than 100 kilograms and is about 30 centimeters in diameter. Their reduced size and weight also makes these weapons a terrorists object of desire given that they could be deliverable using a vehicle and do not require testing.

“Boosted” bombs can be perceived as ‘user friendly’ in that the prospect of accidental nuclear explosion is considered near impossible. In storage, the deuterium-tritium gas is contained in a separate reservoir outside the core, should an accidental explosion of the chemical explosives components occur, the relatively small amounts of plutonium or uranium involved would not be sufficient for a full nuclear explosion.

This means that reactor-grade plutonium, which is relatively unstable and prone to spontaneous fission, could be utilized at significantly reduced risk given the small amounts of material required in a “boosted” bomb.

“Boosting” is essentially used all modern nuclear weapons, including those in Israel, India, Pakistan and possibly North Korea. The development of “boosted” bombs thus confirms the tremendous importance of tritium to the issue of non-proliferation of fission weapons.

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WEAPONS TRITIUM FROM REACTORS

The Watts Bar NPP in the U.S. has been used for weapons-grade tritium production since October 2003. Rods with lithium have been inserted between the uranium fuel elements and the irradiation by neutrons converts it to tritium. The production of new tritium for the U.S. weapons stockpile is considered necessary as tritium (with a half-life of 12 years) decays by about 5.5 percent per year however production in the Department of Energy (DOE) reactors halted due to shut downs for safety reasons. In order to prevent the costly building of new reactors, the DOE chose to use civilian NPPs, a plan that raised protests from many anti-nuclear organizations. The proposed Watts Bar and Sequoyah reactors are vulnerable to severe accidents as their containment systems are considered to be inadequate, which will make also them more vulnerable to terrorist attacks, especially if they become “part of the nuclear weapons complex”.

Objections were not heard as they were considered “inadmissible” and thus no public hearings were ever held.

There are doubts as to whether tritium production is truly necessary, under the START II and 2002 Moscow treaties, tritium will be extracted from dismantled nuclear bombs. Only 240 lithium rods were loaded in Watts Bar, not the 2,304 that had been approved in the license. No rods at all were loaded in the Sequoyah reactors. The rods will be de-fueled in April 2005 and transported to the Savannah River Site, where an extraction facility will be operational in late 2007. It is possible that the sharp reduction in rod irradiation is simply due to the construction delay, but it is also possible that DOE is now recognizing what many have said before – that the need for new tritium has been exaggerated.

Bulletin of the Atomic Scientists, January/February 2004

Tritium and ITER

At present, only small amounts of tritium are shipped globally for industrial or scientific use, it is estimated that the current world market corresponds to the shipment of about 100 grams annually, mostly produced in Canada.

Tritium is already used for various industrial applications, for example luminous dials and gun sights, but only in minute quantities (micrograms). In comparison the ITER project will require the international shipment of large amounts of tritium.

Once operational, ITER's tritium inventory will be about 2 kilograms with an annual consumption of 1.2 kilograms: amounts comparable to several thousands of “boosted” nuclear weapons. To operate on a commercial-scale, reactors would require an inventory of 10 kilograms. Currently, the total amount of tritium in the U.S. weapons stockpile is some 100 kilograms, an average of 10 grams tritium per warhead so the inventory of 2 kilograms in the ITER will be enough to “boost” 200 nuclear weapons.

The expected six annual transports of tritium to the ITER reactor will pose certain risks, theft or hijack being of most concern. Although the tritium will most likely be produced in Canadian CANDU reactors, it is possible for a special facility (like an accelerator) to be built in the host country. This would go some way to addressing the issue of unsafe transports but does not resolve the threat of theft.

It is much easier to conceal significant amounts of tritium and given that the required amounts are smaller (grams

instead of kilograms), much less radioactive and more difficult to detect, effective procedures will need to be put in place to ensure the security of the material.

After withdrawing from the ITER project five years before, in January 2003, the U.S. decided to rejoin the project. This is seen as a calculated political move to gain influence over the project from a proliferation view. Since its withdrawal in 1998, Pakistan and India have conducted nuclear tests and North Korea has been working on nuclear weapons. As the (suspected) weapons of these countries are deliverable by missiles, they are likely to be “boosted” bombs, containing tritium.

For this reason, any international enterprise, like ITER, in which large amounts of tritium are to be used becomes a sensitive undertaking with which the U.S. must participate in order to exert as much influence as possible.

Other fusion proliferation risks

Tritium may be the most important proliferation risk in fusion reactors, but there are other proliferation aspects to consider.

Every fusion reaction produces neutrons that can be used for breeding technologies: the wall of a fusion reactor could be covered with a blanket of uranium to breed plutonium. This advanced concept of fusion is called the “fusion-fission hybrid” and such a fusion reactor could be misused to produce weapons-grade plutonium. It is calculated that a fusion-fission hybrid could breed more than 5,000 kilograms of plutonium annually, compared with “only” 500 kilograms in a conventional heavy-water reactor of the same power.

Fusion research has another spin-off effect: the development of super-conductive magnets, which is of importance to strategic military developments in outer space, ballistic missile defense and electromagnetic guns.

Another technology being studied for fusion energy is the Inertial

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25 YEARS AGO

What happened 25 years ago? We go back to news from our 1979 WISE Bulletin, comparing anti-nuclear news “then” and “now”.

Then

In issue 4 of the *WISE Bulletin* we wrote about the health hazards of the nuclear weapons production plant Aldermaston, U.K.: “At Aldermaston Atomic Weapons Research Establishment last August [1978], the Ministry of Defense closed down the laundry. Three women who worked there suffered plutonium contamination of the lungs. [...] One of the women has not worked in the laundry for some years, but she still carries a lung burden of plutonium above the permitted maximum and fears that it may have even been higher. (*WISE Bulletin* 4, March 1979)

Now

Britain’s nuclear bomb factory at Aldermaston was opened in 1952. The facility has a bad record concerning safety and health issues. About 100 workers have been injured (or even died) because of their jobs, five people have died in fires or explosions and nine workers died as a result of suspected radiation contamination. The plant experienced several accidents, including a number of plutonium fires and radiation leaks.

In 1978, an official inquiry, resulting in the Pochin Report, investigated Aldermaston’s health and safety standards and recommended that staff shortages be resolved, solid and liquid waste buildings replaced and standards of general site maintenance improved. Fifteen years later, Greenpeace concluded that none of the recommendations had been fully implemented. The Greenpeace report of their investigation contains detailed descriptions of the plant’s facilities and a list of known accidents. Another inquiry was conducted by the U.K. Health and Safety Executive (HSE) in 1994 and found that Aldermaston’s health and safety standards did not match those found elsewhere in the nuclear and high hazard industries. (*Aldermaston; Inside the Citadel*, Greenpeace, 1993; *WISE News Communiqué* 463, 13 December 1996)

In 1989, Aldermaston was mentioned as a possible cause of the high incidence of childhood cancer in the area. The Committee on Medical Aspects of Radiation in the Environment (COMARE), which also observed a raised incidence in leukemia around Sellafield and Dounreay, concluded that the increased number of childhood cancers around Aldermaston were “unlikely to be due to random variation or biased selection”. But discharge data from the Ministry of Defense failed to provide a clue as to why the increase had occurred. (*WISE News Communiqué* 318, 29 September 1989)

In 1999, confidential internal documents were leaked to *The Observer* once again confirming Aldermaston’s bad records. A list of more than 100 breaches of safety was found over 12 months of operation, including eight breaches of ‘criticality’ rules. (*WISE News Communiqué* 520, 29 October 1999)

In 2002, the Ministry of Defense announced a huge expansion plan, worth more than 2 billion pounds (US\$ 3.8 billion). The new investments were said to include the production of new nuclear weapons, so called “mini-nukes”. (*Guardian*, 18 June 2002)

For those interested in campaigns: Aldermaston women’s peace camp has a website with campaign updates and news at www.aldermastonwpc.gn.apc.org. They also publish the newsletter *Aldermaston Update!* that can be found on the same site.

Confinement Fusion (ICF). In ICF, tiny pellets (containing deuterium-tritium) are put in a reaction chamber and targeted by high-energy lasers. ICF technology enables the physics of nuclear weapons to be studied on a laboratory-based scale, which could make any clandestine research difficult to detect.

ICF technology could result in a fourth generation of nuclear weapons without plutonium or uranium. In such weapons, deuterium-tritium pellets could be detonated with the lasers instead of by the conventional chain reaction, which will require the development of much smaller high-

energy laser devices. Any country with an understanding of ICF and laser technology could develop such a weapon easily without being detected.

The underlying technology and knowledge of high-energy lasers for ICF could be used to develop laser enrichment technology, which could make it possible to enrich uranium to 100% uranium-235 (weapons quality) in one stage.

Japan

The ISRI researchers concluded that “siting ITER in countries such as Japan, which already has a large separated-plutonium stockpile, and an ambitious

laser-driven [fusion program], will considerably increase its latent (or virtual) nuclear weapons proliferation status, (i.e. its ability to manufacture nuclear weapons on short notice) and foster further nuclear proliferation throughout the world”.

Although ostensibly a non-nuclear weapons state and proponent of disarmament, Japan is confronted with the weapons capability of other countries in the Asia region (Pakistan, India, and North Korea).

With the possible siting of ITER in Japan, the country would have full access to large-scale tritium technology

and with its stockpiled plutonium and reprocessing options all necessary technology to produce “boosted” nuclear weapons will be at its disposal. Regardless of Japan's intent, the siting could have a destabilizing effect in the region and may push other countries to increase their efforts for more advanced nuclear weapons.

Source: *ITER: The International Thermonuclear Experimental Reactor and the Nuclear Weapons Proliferation Implications of Thermonuclear-Fusion Energy Systems*, A. Gsponer and J-P. Hurni, ISRI, 4 February 2004. To be found at <http://arxiv.org/abs/physics/0401110>.

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25TH ANNIVERSARY OF THREE MILE ISLAND 28 MARCH 2004

As part of the BE SAFE precautionary campaign (spearheaded by the Center for Health, Environment, and Justice, www.chej.org), NIRS/WISE calls for an International Week of Action to commemorate the disaster and to oppose the “Nuclear Power Relapse.”

A diverse coalition of groups are planning events for the week leading up to the anniversary addressing such issues as: opposing new nuclear reactors; ensuring radiation clean-up standards; halting the deregulation of nuclear waste; stopping military exemptions from radiation protection regulations; in the U.S., stopping Yucca Mountain and Skull Valley high-level waste dumps, preventing the Mobile Chernobyl waste shipping programs; highlighting how Native Americans suffer disproportionate impacts from uranium mining, milling, and waste dumps.

NIRS/WISE encourages groups in the U.S. and around the world to commemorate TMI's 25th anniversary by holding an event in their locale. Ideas for activities range from information distribution, press conferences, protests against new reactors/facilities/issues affecting your community, movie nights/letter writing parties, watching “China Syndrome” (ironically, currently playing in Harrisburg cinemas), and much more.

Contact Kevin Kamps (kevin@nirs.org) or Diane D'Arrigo (dianed@nirs.org) at NIRS (+1 202 328 0002) for additional ideas or information.

KHAN: THE DUTCH CONNECTION

Although it beggars belief that one man alone could have been responsible, Dr A. Q. Khan admitted to leaking nuclear secrets to North Korea, Libya and Iran – despite earlier reports claiming it had been with the knowledge and approval of senior military officials. Following his confession on a live broadcast on 3 February, Khan apologized to the nation and was swiftly pardoned by President Musharraf who later added that there would be no independent inquiry into the case.

(603.5575) Laka Foundation –

Between 1960 and 1963, Dr. Abdul Qadeer Khan followed metallurgical engineering courses at the Technical University in Germany (Berlin). In 1967, he received his MSc. degree at the Delft Technological University (Netherlands) and became Doctor of Engineering at the University of Leuven (Belgium) in 1972.

After his doctorate in 1972, he began work for the FDO laboratory in Amsterdam (Netherlands), a sub-contracting research institute for the Urenco plant in Almelo. Urenco is a consortium set up by the Dutch, British and German governments to provide enrichment technology. FDO was at the time involved in research and development of centrifuge technology. Khan also worked at the Urenco enrichment plant at Almelo itself but left the Netherlands suddenly in 1975. By 1976, he had joined the Engineering

Research laboratories (ERL) in Kahuta, Pakistan, to set up a uranium enrichment industrial plant.

In 1981, the then president of Pakistan General Muham-mad Zia-ul-Haq renamed the ERL the Dr. A. Q. Khan Research Laboratories (KRL). It became the main laboratory for Pakistan's nuclear weapons pro-gram and its centrifuge plant was used to produce Pakistan's high-enriched uranium for nuclear weapons.

It was not until July 1978, that questions were raised about Khan's activities during his time in the Netherlands. In England an anonymous source, believed to be the Israeli secret service, tipped off an MP about a shipment to Pakistan by Emerson Industrial Controls of high-frequency inverters (inverters are an important part of the centrifuge process and stabilize the flow of electricity).

Eventually bells began to ring and in January 1980 a Dutch parliamentary commission concluded that security at Urenco and FDO was lax; that Khan smuggled blueprints for enrichment technology out of the country and had been able to order equipment that could be used in uranium enrichment from Dutch companies. The report also said that even after Khan had left in 1975, it was possible for him to obtain sensitive materials and technology through his contacts.

In 1983, two companies, FDO and Van Doorne (rotor suppliers), and Khan were summoned by the Dutch state and in October Khan was sentenced in absentia to 4 years. However, in 1985 the sentence was nullified because it was not clear that Khan actually had received the writ. Both companies were cleared of all charges.

Khan continued to visit the Nether-

lands in the 1990s and in 1998 Dutch customs intercepted several shipments to Pakistan ordered by Khan's contacts (meanwhile Pakistan tested a nuclear weapon and Khan was named the "father of the Islamic bomb").

One of his contacts in the Netherlands is said to be Henk Slebos (the famous middleman "Hank S", mentioned by Pakistan authorities recently). Slebos was sentenced to one-year imprisonment in 1985, because of a breach of customs-laws: he exported advanced materials (an oscilloscope) to Pakistan and helped the development of the Pakistan nuclear program.

The Dutch Ministry of Economics blocked five shipments from Slebos to Pakistan in 1998. The shipments contained dual-use goods without a declaration by the Pakistani authorities that these were meant for peaceful purposes. Slebos never attempted to obtain a proper export license and likely cancelled the deal. Slebos had, and still has, several trade companies (Slebos Research, Gemco, Bodmerhof) for "hard-to-find materials" (quote from his website www.slebos.com). In September 2003 Slebos was one of the sponsors of ISAM 2003 (International Symposium on Advanced Materials); organized by KRL.

Sources: *The Observer*, 9 December 1979; *Financial Times*, 3 March 1980; *Trouw* (NL), 3 July 1985; *Vrij Nederland* (NL), 6 June 1998; Press release Dutch organization against arms-trade, 3 September 2003; *De Groene Amsterdammer*, 6 September 2003; *Personal Information*, A.Q. Khan, 2003

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GERMANY'S HALF-HEARTED APPROACH TO WASTE DISPOSAL

The political and legal responsibility for the implementation of final disposal lies with the Federal Government in Germany and given its ostensible commitment to a phase-out policy, this article considers the hazar-dous, controversial and costly business of waste disposal and the preparations being made to address the issue.

(603.5576) Helmut Hirsh – Following a proposal from the state of Lower Saxony, the government in 1977 selected Gorleben as the site for final disposal of all types of radioactive waste, including high-level waste. It was planned that the repository would be ready to receive the first waste containers before the year 2000.

The salt dome at Gorleben was to act as host formation for the waste; however, the high quality of the salt was not the reason the site was selected. Political considerations were more influential and the site was chosen for the following reasons:

- It is situated in a poor agricultural region with high unemployment so it was assumed that residents would welcome any industrial enterprise, even nuclear waste.
- The surrounding region has low population density thus no vigorous local resistance could be expected.
- Furthermore, Gorleben lies in a region then close to the border of the GDR. Many of the people endangered by the repository lived on the other side of this border and could not take

part in protests or file objections against the plans, for obvious reasons.

To date, no waste has been sent into the Gorleben salt dome, site investigation has not officially been completed and the licensing procedure has yet to begin. It would appear that despite the best-made plans, the site selection is not a dead cert. The people in the region continue to resist the plans to this day and neither the pro-nuclear politicians nor the nuclear industry support the proposals.

In addition to delays caused by regional resistance, there are sound scientific reasons to abandon the site:

- The layers of clay covering the salt dome have gaps, permitting free circulation of ground water above the dome.
- The salt dome actually has contact with ground water; salt has been dissolved in the recent geologic past.
- A repository in the Gorleben salt dome would not be protected by multiple barriers, as is generally required in nuclear technology.

Since 2000, there has been a moratorium on further work

(suspended for 3-10 years) on the Gorleben salt dome but this could soon be lifted, or alternatively remain until 2010. (See *WISE News Communique* 532.5186 "Germany: Government and utilities reach agreement on phase-out")

The German Federal Government plans to have a repository for high-activity waste ready by 2030 – in about 27 years. The original 1977 plan was to have a repository within 22 years, which means that the goal is actually 5 years further away now than it was thought to be in 1977 - this could be called 'negative progress'.

The Gorleben situation is similar, although more complicated from a juridical point of view, to the Konrad repository project intended for non-heat-producing wastes; low-level and some intermediate-level wastes, including waste from dismantling of nuclear power plants. Despite years of delays and persistent open questions regarding long-term safety, in 2002 the Konrad repository was licensed but as yet no waste can be disposed of there. The license is not immediately executable (in contrast to the usual practice for nuclear projects), and legal proceedings have been instituted

against the repository by neighboring municipalities. Konrad is not permitted to go into operation until those proceedings are concluded, which could take several years.

The so-called German 'nuclear phase-out' is in fact a lengthy process that allows for the gradual shut down of plants that have more or less operated for their planned commercial lifetime anyway. The Stade NPP, shut down in late 2003, closed for economic reasons alone and between now and 2010, only a couple of NPPs will be shut down. Furthermore, immediate dismantling of a decommissioned NPP is not the safest strategy - allowing decay time of several decades can significantly reduce risk and radiation exposure associated with dismantling.

Hesitant Approach

The red/green coalition government came into power in Germany in 1998 and by the following year, the Federal Minister for the Environment, Trittin, had established an expert commission (AkEnd, 'Arbeitskreis Auswahlverfahren Endlagerstandorte') with the task of developing site selection procedure for a nuclear waste repository. The commission submitted its final report in December 2002 and proposals included:

- A stepwise procedure to select, starting with the whole area of Germany, several potential site regions to begin with, subsequently narrowing the choice to select at least two sites for in-depth investigation.
- Geologic criteria to be applied during the site selection process.
- A procedure for public participation, to give all people concerned a say in the selection process.
- Criteria incorporating social and regional planning aspects to be taken into account in the process.
- A timetable for further procedure. In particular, public discussion and, possibly, revision of the AkEnd proposal according to the outcome of this discussion was to follow in the years 2003 and 2004 ('Phase II').

As a basic condition for the work of AkEnd, Trittin had postulated that only one repository for all waste categories was to be built in the end - meaning that Konrad would be excluded because the site is unsuitable for high-level waste. This stipulation was severely challenged by the majority of AkEnd members on scientific grounds and recently, the Federal Accounting Office (Bundesrechnungshof) also criticized the "one-repository-concept", for financial reasons (see box).

The work of AkEnd certainly constitutes a step in the right direction, in spite of its shortcomings (for example, alternatives to waste disposal in geologic formations were not considered; retrievability of waste not taken into account; social and planning criteria are not binding).

However, despite having a plan, there has been no further progress since the end of 2002. Phase II (broad public discussion) should be halfway complete by now yet has not even begun and is unlikely to begin in the near future.

Both industry and the political opposition are against the AkEnd proposal with the red/green government apparently hesitant and irresolute in efforts to implement it.

Future Deadlock?

The present situation in Germany can be characterized as deadlocked. The nuclear industry and the opposition parties insist that the Gorleben moratorium be lifted and that the site investigation be concluded as swiftly as possible. They claim that the site will very likely be found suitable despite its problems, therefore should be used so as not to waste the 1.3 billion Euro (US\$ 1.6 billion) spent so far. They also demand that the Konrad repository go into operation as soon as possible and believe that nuclear plant operators should not be forced to pay for the procedure as proposed by AkEnd. The Federal Government, on the other hand, wishes to implement the AkEnd proposal but are inconsistent in their endeavor.

The central, most important idea of the AkEnd procedure is to start site selection from zero, without prejudice, from a so-called 'white map' of

GERMAN ACCOUNTING OFFICE REPORT

The internal report of the Bundesrechnungshof (Accounting Office) on the costs of German waste policy concluded that the "one-repository-concept" could cost as much as 10 billion Euro (US\$12.4 billion). The moratorium on research at Gorleben and the exclusion of Konrad resulted in Environment Minister Trittin choosing to build one single repository for all waste categories. The search for a new single site will lead to the following costs:

- compensation to utilities that financed excavation and conversion works at Gorleben and Konrad: 1.5–3.2 billion Euro (US\$ 1.9-4 billion);
- transport and interim storage of low/medium level waste in absent of Konrad: 1.9 billion Euro (US\$ 2.4 billion);
- search for a new single repository: 6.8 billion Euro (US\$ 8.4 billion).

Minister Trittin has denied responsibility for the extra costs and accused the Accounting Office of meddling in politics. Trittin stated previously that one single repository has lower operational costs than two separate sites.

**Nucleonics Week, 5 February 2004;
Ministry of Environment press
release, 5 February 2004**

Germany. However, the government does not want to give up the sites of Gorleben and Konrad (the existing moratorium applies only to Gorleben whereas Konrad was licensed in 2002). The result is a half-baked mixture of a new approach with old mistakes, a policy that is self-contradicting.

It is not really surprising that the government could not assert itself and win over opposition and industry to their standpoint, since it seems unsure of what it wants.

At present, the Federal Ministry for the Environment is considering new structures and a new division of responsibilities for the implementation of final disposal projects. The favored model appears to be the founding of a corporation to perform the task on behalf of the federal

authorities (indirect federal administration, "mittelbare Bundesverwaltung") as opposed to the present construction of direct federal responsibility. The members of the corporation would be all major producers of nuclear waste, i.e. the nuclear power plant operators.

The obvious shortcoming of this model being that if implemented, the NPP operators would be responsible for executing the new approach, with the AkEnd procedure for new site selection, they actually despise. Thus, it would be a classical case "to give the goat the gardener's job", to quote a well-known German idiomatic expression.

Costs of Disposal and Decommissioning

As in the other EU countries, German NPP operators had to establish reserve funds for the expected costs of waste management and disposal, as well as decommissioning.

The sources differ slightly concerning the exact volume of those funds. However, it is clear that at present, the overall amount lies in the vicinity of 35 billion Euro (US\$ 44 billion). The shares of waste management and disposal on the one hand, decommissioning on the other are roughly 55 %: 45 %. A company like Rheinisch-Westfälisches Elektrizitätswerk (RWE) has funds of about 10-11 billion Euro (US\$ 12-13 billion), a very sizeable amount, in the order of 10 % of the overall balance sheet of the RWE company group.

The German funds also appear large compared to the funds in other countries. Alone, they constitute about 50 % of all such funds in the European Union (15 old members). The funds in France, where there are over three times as many NPPs operating as in Germany, are only about a third of the German funds.

The reason the coffers are well filled in Germany is not that the German NPP operators are particularly conscientious. From their point of view, the money can be put to better use and the situation as it is in Germany permits each company to use its own funds as it sees fit meaning that it is free to invest the money, take over other firms etc. The profit thus gained increases the company profit and power and allows it an unfair advantage over the market. The most severe problem associated with this model is that it remains questionable whether the funds will really be available when needed since they might at that time be locked in investments.

An obvious alternative solution would be to have the disposal and decommissioning reserves in funds under public control, rather than within the clutches of the NPP operators. So far, however, the red/green coalition government has shown no willingness to pursue such an alternative. On the contrary, the German government, fearing that German utilities would otherwise withdraw from the 'nuclear phase-out' agreement opposed even the very cautious reforms proposed recently by

MORSLEBEN ALERT

Action group Greenkids of Germany will hold a weekend seminar from March 20-21 to discuss options for tens of thousands of cubic meters of radioactive waste stored at the Morsleben repository.

The federal German government inherited Morsleben on reunification in 1990. The salt mine, 100 kilometers east of Hanover had been designated as a "final storage" site for nuclear waste by the communist East German government.

The federal government planned to continue operating the site until several thousand tons of salt crashed from the ceiling leading to the plan being scrapped. Activists are demanding that waste currently stored there is removed. Public consultation on the closure will be held in 2005.

For more information, contact Greenkids by email at mail@greenkids.de, by post at PF 320119, 39040 Magdeburg, Germany and by phone on +49 162 78 68 204.

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PFS DUMP CRAWLS AHEAD DESPITE TRIBAL MELTDOWN

A coalition of eight U.S. nuclear utilities led by Xcel Energy (formerly Northern States Power) of Minnesota aims to "park" 40,000 metric tons (44,000 U.S. tons) of irradiated nuclear fuel on the Skull Valley Band of Goshutes Indians reservation in Utah. This represents 80% of the commercial high-level waste currently existing across the country. 4,000 cross-continental train shipments would be required to transport the wastes. This would be a for-profit venture for its charter members, in that non-member utilities would pay a storage fee.

(603.5577) NIRS - Despite bogged down licensing proceedings and the indictment of its tribal partner on federal felony charges, the Private Fuel Storage (PFS) proposal moves closer to opening. PFS proposes "interim"

storage at Skull Valley for 20 to 40 years until the U.S. governments proposed national burial site at Yucca Mountain in Nevada would open and could take the wastes. Opponents in Utah question whether four decades

can be called "temporary," and what would happen if Yucca never opened.

The waste targeted for PFS is roughly the amount expected to be generated in the U.S. that would be in excess of

Yucca's legal cap for commercial waste of 63,000 metric tons. The growing fear is that Skull Valley would become a de facto permanent high-level radioactive waste dump on the surface of the desert just 45 miles upwind from metropolitan Salt Lake City. For the nuclear power industry, PFS represents an attempted "end run" around the ongoing opposition to the controversial Yucca proposal by moving the wastes much closer to Nevada as soon as possible, while establishing an overflow dump for excess wastes it wants to generate at old reactors granted 20 year license extensions as well as new reactors.

The PFS nuclear utility coalition had hoped to be shipping waste to Skull Valley by now but has been hit with multiple delays. Last March, the U.S. Nuclear Regulatory Commission's (NRC) Atomic Safety Licensing Board (ASLB) postponed granting a license due to the potential for accidental crashes into PFS by military aircraft (See *WISE/NIRS Nuclear Monitor* 585.5502: "U.S. PFS blocked, but for how long"). In May, NRC Commissioners ordered the ASLB to expedite its 6-year long process and make a decision by the end of 2003 but by August, the ASLB announced it would not meet that deadline citing delays by PFS. (1)

Lawyers working for Nevada against the proposed Yucca Mountain high-level radioactive waste dump agreed to represent Utah on its arguments that PFS should be blocked due to the risk of aircraft crashes. The ASLB's ruling on the matter could set an important precedent, in that Yucca is also immediately adjacent to another Air Force bombing range. (2)

In early September, the ASLB further postponed its ruling until mid-April 2004, citing the complexity of the analysis of the consequences of an aircraft crash, the large number of expert witnesses and follow-up questions involved, and the strict security safeguards required by the NRC Commissioners after 11 September 2001, supposedly to prevent terrorists from using revelations to

plan an attack on PFS. The NRC ordered that all paperwork, and even conversations about it, be limited to specifically authorized persons only and that phone, fax, email or Internet can no longer be used to communicate information. Documents can no longer be left unattended - even during toilet breaks - and must be under lock and key if no authorized handler is present. Utah's expert witnesses are based in several states and overseas, but NRC limits collaboration to overnight shipping of documents.

The ASLB hearings are conducted behind closed doors. "Just reviewing PFS's documents has been difficult," said Connie Nakahara, an attorney representing Utah against the dump. (3) Such measures are ironic given the Nuclear Energy Institute's post-9/11 confidence that aircraft crashes would not breach radioactive waste storage containers. (4)

Such strict security rules may set poor precedent, effectively blocking meaningful public involvement in the NRC's upcoming licensing proceeding for Yucca. When NRC staff announced their need to further review PFS's aircraft accident consequences analysis, PFS requested that ASLB suspend the proceedings until it could answer NRC's queries about the storage containers' ability to withstand a jet crash. ASLB's final ruling is not now expected before mid-June, 2004. (5)

Despite such delays, PFS has won many battles recently. On New Year's Eve, the ASLB ruled in favor of PFS and against the Southern Utah Wilderness Alliance on one of the last remaining contentions against the dump. Despite a bill pending in the U.S. Congress, "America's Redrock Wilderness Act," that would preserve the north Cedar Mountains bordering Skull Valley as perpetual wilderness free of roads and train tracks, the ASLB ruled that although "SUWA has worked diligently to preserve such [wilderness] values elsewhere in the state...we must say that those values are neither apparent nor affected here." ASLB's ruling would grant PFS the go-ahead to build a rail line down Skull Valley for waste

trains. Altogether, the ASLB has dismissed nearly three dozen contentions against the dump, including ones filed by Utah concerning earthquake dangers and PFS's financial viability. Utah can appeal ASLB decisions to the NRC Commissioners as well as to the federal courts. (6)

The NRC Commissioners are still pressing for a prompt license decision by ordering both Utah and PFS to have any appeals prepared, fast-tracking a process usually left till after the ASLB ruling. Despite new Utah Governor Olene Walker's resolve to carry on where her predecessor left off (anti-PFS Gov. Mike Leavitt recently became U.S. Environmental Protection Agency administrator), the state has spent nearly US\$4 million in recent years fighting PFS, and may be running out of money. (7)

Just two days after the U.S. Court of Appeals for the District of Columbia Circuit heard arguments on the Yucca Mountain controversy, Utah argued before the same court that Congress never authorized NRC to license a private interim storage site for high-level waste, although two of the three judges on the panel expressed immediate skepticism. (8)

Meanwhile, the tiny Skull Valley tribe itself is undergoing a meltdown. Disputed pro-dump tribal chairman Leon Bear has accused opponents, including anti-dump member Margene Bullcreek and her two daughters, of treason and threatened to expel them from the tribe. Bullcreek's attorney has petitioned the federal courts alleging that Bear has sought to restrain and silence her opposition to PFS and argued "If the court does not immediately intervene to review the actions of Leon Bear...[the Bullcreeks] will have no hope of retaining their membership in their band, which is central to their very cultural, social, legal and spiritual identity." (9) Expulsion from the tribe has been compared to a "tribal death penalty." (10)

Showing that radioactive waste is as much a divisive social poison as it is a

radioactive one, the 121-member tribe suffered a bombshell just before Christmas when rival leadership groups were indicted on federal felony charges, the culmination of a two year investigation by the Internal Revenue Service, Dept. of Interior (DOI), and Dept. of Justice that included an FBI raid on tribal offices that seized financial documents. Pro-dump chairman Bear faces two charges of embezzling tribal funds, one count of embezzling federal program funds, and three counts of tax fraud. He faces up to 29 years in prison and a US\$1.5 million fine. Bear is also under investigation for his role in setting up suspicious tax havens involving a Swiss bank and a shadow company based in the British Channel Islands. (11 & 13)

A rival leadership group asserts it replaced Bear's council at a tribal election in September 2001 but the U.S. Bureau of Indian Affairs (BIA) refused to recognize the election and still supports Bear's authority. Dissident council members Marlinda Moon, Sammy Blackbear, and Miranda Wash face five counts each of bank fraud and aiding and abetting, as well as one count each of theft from tribal accounts despite Blackbear's assertion that they were simply freezing funds to prevent Bear from stealing any more. (12)

If convicted, each could face over 150 years in prison and US\$5 million in fines. They have pleaded not guilty and go to trial 19 March. Blackbear argues that the charges fly in the face of the 2001 election, which he says show they have tribal support. He also says the charges against him are an attempt to undermine his civil rights lawsuit against BIA, DOI, and DOI Secretary Gale Norton for actions and inaction amounting to "an overall discriminatory plan to target Indian reservations for the effectively permanent storage of the nation's high-level nuclear waste." A federal judge in Utah dismissed his case in September 2002, but Blackbear has appealed the ruling. (13)

Some incredible statements followed the indictment of Bear. Despite signing

the dump contract with Bear 7 years ago, without the knowledge or consent of the rest of the tribe, a PFS spokeswoman responded "We are fully committed to this relationship with the band and with the project, and we fully expect to go forward. Our contract is with the band and not with him." The BIA said it would support PFS as long as the tribe continues to and perhaps reflecting Bush Administration pro-nuclear power policy, the U.S. Attorney prosecuting the case said, "The charges today have nothing to do with high-level radioactive waste and Bear's efforts to bring it here." (13)

Dump opponents called for a halt to the PFS licensing proceeding. "I can't imagine a scenario under which we find it acceptable to store high-level nuclear waste when the leaders or individuals in charge for managing the facility are facing...the charges raised here. I'm hopeful the federal agency including the NRC and the BIA and others would be weighing the gravity of this situation," said Diane Nielson, executive director of the Utah Dept. of Environmental Quality.

"The licensing process should be suspended until this mess is sorted out. It doesn't look good when the star player has been indicted," said Jason Groenewold, director of Families Against Incinerator Risk and HEAL Utah. (14)

Despite her hard won success at blocking any irradiated nuclear fuel shipments to Skull Valley thus far, Margene Bullcreek concluded, "The waste already has destroyed our tribe." (9)

Most recently, the NRC Commissioners rejected Utah's request that a dozen of its contentions against PFS, several alleging inadequacies in the Environmental Impact Statement, be reconsidered. The Commissioners did agree, however, to hear further arguments on whether PFS's proposals for "detecting and removing contamination" from waste transport/storage containers at the site would be adequate. (15)

Sources:

- (1) "N-waste decision to be delayed," Salt Lake Tribune (SLT), 1 August 2003.
- (2) "Anti-Yucca lawyers to aid in Utah battle: firm to focus on probability of an aircraft crash at site," Deseret Morning News (DMN), 17 August 2003.
- (3) "Goshute plan suffers setback: Regulatory limbo, NRC has delayed its opinion on the safety of storing nuclear waste on the Indian reservation," SLT, 27 September 2003
- (4) "EPRI Analyses Show Nuclear Plants Can Withstand Aircraft Crashes," Safety and Security at Nuclear Power Plants, Security Effectiveness: Independent Studies and Drills, Nuclear Energy Institute, 2002: www.nei.org/index.asp?catnum=2&catid=279
- (5) "Design concerns delay plans for nuclear storage site," SLT, 11 October 2003.
- (6) "Goshute rail won't ruin wilds: panel rejects eco-groups claims of spoiled scenery," SLT, and "Goshute N-waste site on track as panel gives OK to rail line," DMN, both on 1 January 2004.
- (7) "Walker picks up banner in N-waste battle," SLT, 1 December 2003.
- (8) "Appeals court hears arguments on Goshute N-waste," SLT, 17 January 2004.
- (9) "3 Goshutes fighting 'lock-up': lawyer wants writ of habeas corpus for dissident kin," DMN, 30 July 2003.
- (10) "Goshutes duo fights to protect status: 2 fear actions after they questioned leader's authority," DMN, 12 July 2003.
- (11) "Goshute tribal leaders face another legal battle: judge seeks answers on papers related to Starlike Properties," DMN, 9 January 2004.
- (12) Phone conversation with Blackbear, late December 2003.
- (13) "Rival leaders of Goshute tribe indicted by Feds," SLT, and "4 Goshutes charged with fraud: indicted include leader of Skull Valley Band," DMN, both on 19 December 2003.
- (14) "Moratorium urged on N-waste," DMN, 19 December 2003.
- (15) "NRC rejects most – but not all – protests against Utah nuke waste project," The Energy Daily, Feb. 10, 2004.

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For more information on the ravages Utah has suffered during the Atomic Age (uranium mining, above-ground nuclear weapons testing, and nuclear waste dumping) see the DMN's February 2001 "Toxic Utah" series at deseretnews.com.

IN BRIEF

North Korea: Six-party talks set. The second leg of six-party talks on North Korea's nuclear weapons programs is due to begin on 25 February in Beijing; also host to the first round of talks last August. North Korea issued yet another offer to *freeze* its program in return for immediate U.S. concessions however the offer was again rejected by the U.S. reiterating its insistence that North Korea commit to *dismantling* its programs before concessions can be made. Despite hopes for productive talks, there are no expectations for a swift conclusion. (See also *WISE/NIRS Nuclear Monitor* 602.5572 "North Korea welcomes U.S. delegation")
BBC News, 3 February 2004

San Onofre shipment cancelled. Southern California Edison (SCE) has cancelled its controversial plans to ship a reactor vessel around South America to South Carolina. (See *WISE/NIRS Nuclear Monitor* 602.5571 "U.S. waste transport via Cape Horn challenged") An Argentinean judge recently issued an order banning the shipment from the country's territorial waters. SCE claim the change of plan was necessitated by delays finalizing arrangements causing them to miss the last window of opportunity to meet the deadline for delivery at the disposal site. The reactor vessel will now remain at San Onofre until "appropriate arrangements are made for permanent disposal".
San Diego Union Tribune, 3 February 2004

France: new text for secret defense decree. The French government published new text for the "secret defense" decree late January in response to protest that arose when the first draft was published on 9 August. The decree stipulated that information related to physical protection, emergency planning or transports of any "*nuclear materials*" will be characterized as national defense secrets (see *WISE/NIRS Nuclear Monitor* 595.5551: "New French regulation makes nuclear as secret as military activities"). According to the government, the new proposal is "more restrictive", i.e. better specified what information will be

exempt from publication. Anti-nuclear organizations have called the new text unacceptable" and a Supreme Court challenge of the original decree initiated by Greenpeace will be maintained.

NuclearFuel, 2 February 2004

Caribbean rejects nuclear shipments. The issue of nuclear shipments was addressed at a high level meeting of the (46) Small Island Development States (SIDS) on 3 February, where the decision was made to oppose transportation of radioactive materials through the Caribbean region effective immediately. The Nassau Declaration and Draft Strategy was agreed because of "...growing concern with security and environmental implications of the disposal and transport of radioactive materials and the lack of adequate liability and compensation regimes..." The declaration is issued at the time when a transport of high-level waste is expected to travel through the Caribbean and the Panama Canal on route to Japan from France. www.barbadosadvocate.com, 3 February 2004

U.K. nuclear dustbin ambitions. A document prepared for the Department of Trade and Industry (DTI) on 30 January calculates possible profits of up to GBP 650 million (US\$ 1.1 billion) for BNFL if intermediate-level waste is retained at Sellafield reprocessing plant instead of being returned to the country of origin. The consultative document, prepared by consultancy firm NAC International, acknowledged the problem of where the waste would be stored given that the earliest possible approval for a deep under-ground repository is 2005, meaning that wastes would have to be stored above ground in the interim. The document has been criticized by opposition parties in the U.K. because NAC International also carry out private consultancy work for BNFL and lead author of the report, Geoff Varley, was employed by BNFL for 13 years. NAC have denied any conflict of interest.

**The Independent 2 & 3 February 2004;
BBC News, 2 February 2004**

US Savannah River Site delayed. The Bush administration will delay construction at the Savannah River Site (SRS) by at least 10 months according to budget documents released on 2 February. Construction of the MOX plant, part of a US\$ 3.8 billion project at SRS, was to begin by July but is now delayed until May 2005. Last year, Congress committed about US\$ 400 million to the plant and President Bush now proposes an additional US\$ 368 million for 2005. Disagreements with Russia over construction of a companion facility have delayed the American plant, according to Department of Energy documents released as part of President Bush's proposed 2005 budget. The dispute with Russia centers on liability over plant construction in Russia. U.S. contractors want legal protection in the event that the American-designed Russian plant encounters problems. The Russian plant is supposed to be constructed in roughly the same time frame as the U.S. plant, but the Russian plant is behind schedule.
The State, 4 February 2004

Feasibility study on Indonesian NPP. According to the head of the Indonesian Nuclear Energy Development Center of the National Nuclear Power Agency (Batan), Arnold Y. Soetrisnanto, the agency is to commence a feasibility study into proposals for a nuclear power plant (NPP) this year. The disputed Muria NPP (PLTN) will be built in Jepara regency, Central Java. The plant will consist of six generator units, each capable of generating 1,000 megawatts. The scheme would cost US\$12 billion, says Soetrisnanto, and would be completed in 2016. A preliminary study claimed that people living near the site of the project supported it, but those living further away were opposed. The government will involve private parties in the funding of the project, including Korea Hydro & Nuclear Power Company. Anti-nuke activists are protesting against to plan and the Forum Jaringan Nasional Masyarakat Anti Nuklir Indonesia (FJN MANI) will hold a workshop on 24/25 February in Jepara. The organization hopes that local people will work together with FJN MANI to halt the plan.
The Jakarta Post, 10 February 2004

Bush's proposal to inflate Yucca budget irresponsible. President Bush's proposal to boost the budget for the Yucca Mountain nuclear waste dump to US\$ 880 million and change how the project is funded is irresponsible given the pending legal challenges against the project and unresolved questions about the site's safety, watchdog Public Citizen said on 2 February. In the 2005 preliminary budget, Bush allocated much of the additional funding (increased by 50% from 2004) to develop and operate the transportation system for shipments to Yucca. The budget also calls for the purchase of truck, rail casks and other equipment for waste shipments in 2010. According to Wenonah Hauter, director of Public Citizen's Critical Mass Energy and Environment Program, the idea of buying equipment for transporting waste before questions about the safety of the site are resolved, and even before

the routes and mode of transport are determined, is ludicrous. The Department of Energy has been working on answering 293 scientific questions regarding Yucca Mountain's ability to keep radiation from contaminating the surrounding environment since September 2001. So far only 83 questions have been answered and accepted by the U.S. Nuclear Regulatory Commission. The U.S. Court of Appeals for the District of Columbia is deciding a slate of lawsuits against the project.

Public Citizen, 2 February 2004
(www.citizen.org)

Sweden/Norway: protests against operation approvals. Anti-nuclear groups are protesting against the decision to restart of Norway's Halden research reactor and license renewal recommendations for Sweden's two Studsvik reactors. Officials at the

Swedish Nuclear Power Inspectorate (SKI) said that improvements in security and procedures justify allowing continued operation but added that more work needs to be done. The Swedish Antinuclear Movement has filed protests with regulators saying that the 45-year old units are unsafe and too old. According to SKI, safety has improved markedly in past years. The Norwegian Radiation Protection Authority (NRPA) gave approval for the restart of 44-year old Halden, down since July for repairs to cracks in primary circuit pipe welding, late January. Environmental organization Bellona claims that the reactors are leaking heavy water, which could lead to tritium emissions being released into the atmosphere.

Nucleonics Week, 5 February 2004

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