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SECURITY UPGRADES FOR U.S. REACTORS; WASTE CASKS VULNERABLE TO ATTACK

The U.S. Nuclear Regulatory Commission (NRC) is soon expected to order security upgrades at the nation's nuclear power stations. Although details of the plans are unavailable, questions have already arisen over their effectiveness. Meanwhile, with Bush about to consider Yucca Mountain, a video showing a missile blasting a hole in a nuclear waste cask highlights concerns about nuclear waste transports.

(563.5372) WISE Amsterdam - In an unusual move, news of the planned upgrades came not from the NRC itself, but from industry lobby group Nuclear Energy Institute (NEI). According to the NEI, specific details of the modifications will not be disclosed for security reasons, but they will be related to employees, training and physical barriers around the plants.

Ultimately, some of the plants may need some "bricks and mortar adjustments" to guard against a possible airline attack, according to Tom Ridge, Homeland Security Director, speaking at the National Press Club on 7 February.

U.S. officials are concerned that the al Qaeda network could be plotting a second airline attack, this time on a nuclear plant.

"Our sense today is that these plants are sitting ducks", said Paul Leventhal, president of the Nuclear Control Institute. Leventhal also criticized the NRC's review of security measures at nuclear installations, calling it a "topless to bottomless review" which is "meaningless and infinite in its scope".

Waste casks vulnerable

With President Bush shortly to consider Spencer Abraham's recommendation on building a nuclear waste repository at Yucca Mountain, the security problems of nuclear waste transports have been highlighted by a videotape obtained by Nevada lawmaker Shelley Berkley.

The video shows a 1998 test in which an anti-tank TOW missile blew a grapefruit-sized hole in a Castor V/21 nuclear waste cask.

The test was carried out to show the strength of a new concrete compound. When the cask was covered in concrete – as is usual for waste casks stored on-site at nuclear power stations – it survives the missile attack. However, without the concrete, the missile blows a hole in the nuclear waste cask.

The TOW missile is quite common as far as military hardware goes, being used by the military in over 40

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countries. It can be fired from a launcher on a flatbed truck.

Sending the nation's nuclear waste to Yucca Mountain would require thousands of nuclear waste shipments by truck and train through 43 U.S. states. A missile punching a hole in a nuclear waste cask could create a "Mobile Chernobyl" scenario in which a radioactive plume would disperse particles of irradiated fuel over a wide area.

Sources: Reuters, 11 and 14 February 2002; *Platts Nuclear News Flashes,* 7 February 2002; *Las Vegas SUN,* 8 and 12 February 2002; *Why we call it "Mobile Chernobyl"* (NIRS Southeast factsheet)
Contact: NIRS

INTERNATIONAL NUCLEAR DUMP PLAN SHELVED

The Pangea Resources International company has cancelled its commercial program to realize a multi-national nuclear disposal site. Pangea Resources Australia directed its last plan to construct an underground disposal site in West or South Australia. As there was little support for the project, Pangea recently decided to end its commercial activities and change its organization into "a widely based interest group".

(563.5373) WISE Amsterdam – The decline of Pangea Resources International started at the end of October 2001, when shareholder BNFL suspended its financial support for the project. The partner shareholder Enterra Holding Ltd. (EHL), parent company of the Canadian geotechnical company Golder Associates, quit at the same time. BFNL considered itself as too "lonely" in the project and did not want to be the sole proponent of an international disposal site, and thus the sole target of resistance against it. Another reason to stop the project was the long time scales that would be needed to realize any repository project and especially an international disposal site.

The Swiss waste management authority Nagra was in the past also a shareholder of Pangea Resources Australia but relinquished its small stake in the company in 2000. It did not want to risk a conflict with its goal of siting a national disposal site in Switzerland.

Pangea Resources International has already ceased its commercial operations and daughter company Pangea Resources Australia will do so in the next months.

The team that ran Pangea is now preparing a rebirth as a "widely based interest group". Former Pangea chairman Charles McCombie said at a London radwaste conference in December that talks have started with 10 organizations in 10 countries to set up such a group, but he refused to make public the names of the organizations until final decisions have been taken. The proposed name for the group is Pangea International Association.

History
The idea for Pangea was developed by two Golder Associates members who observed that there was little progress in waste disposal projects worldwide. They thought that a proposal for a multi-national disposal site would have a chance and created Pangea Resources Australia in 1997. According to them, Australia is the best place in the world for the long-term isolation of nuclear waste because of its big land mass.

Pangea's plan for a site in Australia consisted of a disposal facility that would receive annual shipments of 700 canisters of high level waste, 2,000 tons of spent fuel and 20,000 m^3 of intermediate level waste. The cumulative amount of spent fuel to store in 40 years was 75,000 tons, about 20% of the world's total amount of spent fuel. Pangea Australia spent some US$15 million on studies concerning Australia.

Candidate countries to send their nuclear waste to a multi-national disposal are countries that have relatively small volumes of high-level reprocessing waste or spent fuel or have little financial resources to construct a disposal site on their own. Countries that have been identified in 1998 by an IAEA working group on international storage as possible clients for a multi-national disposal site are: Pakistan, Armenia, Slovenia, Netherlands, Brazil, Mexico, South Africa and the Czech Republic. All of these will have accumulated less than 1,000 tons of high-level waste by 2010.

The proposal for a dump in Australia became public in 1998 when a promotion video was leaked to

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The **next issue** of the *WISE/NIRS Nuclear Monitor* (564) will be mailed out on 8 March 2002.

Oops! In the last issue, there was a mistake in the e-mail address for Outi Hannula in Finland - outih@vihrealiitto.fi is the correct address.

Australian nature conservation groups. The idea that Australia would become the dump for nuclear waste from all over the world raised a lot of protests. The federal government declared not to support Pangea's plans. The formal position of the government did not give much confidence when it appeared that the premier's former chief of staff had met with Pangea representatives.

A disposal site for low level waste is planned in Billa Kalina, Southern Australia. The opponents of that site feared that it eventually would become the high level waste dump that Pangea was looking for. Pangea conducted a feasibility study into the construction of a disposal site at Officer Basin in West Australia. The government of the State of West Australia adopted as a reaction in 1998 a law that required the state's permission for any international waste project. Its premier at the time, Richard Court, warned BNFL that the project was a "mission impossible".

Pangea also looked at other possible host countries after public and political opposition in Australia increased. Other countries that were considered by Pangea as possible hosts are Argentina, South Africa, Namibia and China.

Apart from the Pangea proposal for a multi-national disposal site for high level waste, other ideas have floated around in the last decade. An international working group studied in 1994 the possibilities of an international storage (see *WISE News Communique* 475.4710: "IAEA symposium on the future of nuclear energy"). The Palmyra Island and the Marshall Islands in the Pacific were subject of discussion (*see WISE News Communique* 459.4557: "Palmyra waste storage still not out of the question" and 418.4136: "Marshall Islands nuclear dump?"). Recently, Russia approved the import of spent fuel for storage (see *WISE News Communique* 552.5300: "Russia open for nuclear waste import").

Sources: www.theage.com.au, 23 January 2002; *NuclearFuel*, 4 February 2002; website Pangea Resources International: www.pangea-international.com; (draft) factsheet on Pangea, Laka Foundation (Netherlands), 2000

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PUSH FOR A NEW PWR IN FRANCE

France has to start developing more renewable energy in the next ten years, but must also at once start building a new PWR reactor : this is the message given by the Ministry of Finance and its Industry arm in a report given to Prime Minister Jospin at the end of January.

(563.5374) Noël B. Danel - According to the French financial daily *La Tribune*, Christian Pierret, a junior Minister in charge of Industry and Energy, has to start at once the building of a pilot reactor on the model of the EPR (European Pressurized Reactor). Although Germany's Siemens is no more part of the partnership, this represents a new attempt by Areva, the French nuclear conglomerate, to push for immediate construction of a reactor.

The Minister insisted in a separate letter to Jospin that the nuclear "part" should not be removed. In another letter the CEO of Framatome expressed his support. The content of the letters was described in *La Tribune*, which commented that Pierret took a risk by advocating this pilot reactor in the report.

Presently, no new construction is allowed according to the political agreement concerning the participation of the Greens in the Socialist-led government of France.

The final version of the report, posted on the Ministry's web site, seems watered down compared to the original. The text recalls that there is no need for new nuclear reactors before 2010 or after. Rumor has it that Pierret, who also said he would soon abandon politics, is now looking to "parachute" into the nuclear industry, and this would explain the strong lobbying.

According to French law dating from the EU Electricity Liberalization directive, the report to Jospin is to be submitted for approval by the Parliament by the fall of 2002. The text then forms the base for the periodic investment plan in energy, the "*programmation pluriannuelle d'investissement de production*" (PPI).

One huge untold part of the debate in France is the duration of the 58 existing PWR reactors. Officially they are licensed for 30 years. The new report mentions some 40 years or more for their duration.

This means that the first reactor, in Fessenheim (Alsace) could be closed in 2017 and not in 2007, and then the bulk of the reactors would last until the third decade of the millenium.

Repeated reports come with further dates, not the least the Charpin-Dessus-Pellat report of 2000, where in most scenarios reactors continued until 45 years old.

This describes a relative consensus in the nuclear industry and among politicians, but no technical report describes what work would be necessary and in what condition the reactor vessels would be by the end. It also does not seem clear who will

take responsibility for such a decision and when.

What is clear though, is that no need for new reactors is envisaged, even by its advocates. Only "pilots" to enable exports of reactors are now advocated because growth in power demand is slow and exports are limited by transmission lines.

Launching such a reactor would of course help AREVA to go public on the stock market, as was mentioned when the conglomerate was started a year ago.

One more argument of Christian Pierret in his letter is that the 11 September terrorist attacks in the US "only reinforce the interest in new reactors, with much more built-in safety standards against terrorism". Such foresight must seem amazing, because most of the studies for the European Pressurized Reactor are now about ten years old. But in France, wonders never cease for all things nuclear.

Source: Noël B. Danel, Paris

Contact: WISE Amsterdam

"ATOMIC WARRIOR"

French nuclear corporations CEA-Industrie, Cogema, Framatome ANP and FCI have got together to form a new conglomerate called Areva. To get its name known, Areva decided to sponsor France's entry in the America's Cup yacht race, naming the yacht "Défi Areva" (Areva Challenge). However, this soon hit opposition from environmental groups. In New Zealand where the race starts and where memories of France's sinking of Greenpeace's "Rainbow Warrior" are still strong, the yacht has been dubbed "Atomic Warrior". In France, the anti-nuclear network Réseau "Sortir du Nucléaire" is planning meetings in the towns of Vannes and Loreint in Brittany, where the "Défi Areva" team is based. Brittany has no nuclear power stations - plan after plan ended up being shelved after tens of thousands of people took part in protests.
Web site www.arevagroup.com; *The New Zealand Herald,* 15 February 2002; Union Démocratique Bretonne press release, 12 January 2002

CERNAVODA 2: EXPORTING NUCLEAR RISKS

In the next weeks, the European Commission (EC) and the Italian and Canadian governments are going to take the final decision on the approval of loans, credits and financial guarantees totalling nearly US$700 million for the completion of the controversial second reactor of the Cernavoda Nuclear Power Plant in Romania (see *WISE News Communique* 560.5354, "International opposition to Romania's Cernavoda-2").

(563.5375) Campagna per la riforma della Banca mondiale - It is likely that Export Credit Agencies from Canada (Export Development Canada) and Italy (SACE) will wait for the EC's decision before approving their credits and guarantees for companies involved in the project (Atomic Energy of Canada Ltd (AECL) and Ansaldo Energia from Italy). The European Commission is to decide on the concession of a 350 million Euro (US$305 million) Euratom loan to the government of Romania. According to European officials, the assessment of the Cernavoda 2 project will shortly be reviewed, and then will be passed to the EC for a final decision. This should happen in the next weeks, but it is still unclear whether this decision will be conditional on the approval of the 2 billion Euro (US$1.74 billion) replenishment of Euratom's funds by EU Member States (see box "More cash for Euratom?" in *WISE News Communique* 545.5261, "Russia: Adamov accused of corruption").

International NGOs, co-ordinated by Friends of the Earth Europe, recently questioned the eligibility of the Cernavoda 2 project for Euratom lending. According to the European Council's 1994 decision for granting Euratom loans to certain non-EU countries, these loans are supposed to be used for safety upgrades of existing reactors and not for the building of new reactors. This interpretation – that the loans are meant for older Soviet designed reactors – seems to be shared by the Commission in its new Communication of 21 January 2002, which is trying to argue the case for more Euratom funds.

According to the EU Directorate-General on Enlargement Affairs, the EC commissioned under the PHARE programme four studies in the last years in order to better assess Cernavoda 2 project's implications: the Environmental Impact Assessment (EIA) study, the Safety Study, the Economic Justification Study and a Financial Study. The *Campagna per la riforma della Banca mondiale* has asked the EC to make these studies public and to submit them to public consultation with Romanian and international NGOs before the loan approval. DG Enlargement committed to disclose just the EIA in the next weeks, but not the other studies which, according to the Commission, are subject to the new European Regulation on commercially confidential information.

As concerns the Canadian and Italian governments, Export Development Canada, which is intended to lend a US$250 million credit, and AECL made public on 1 December 2001 the

Environmental Assessment Summary produced by the Canadian company itself – thus generating a "conflict of interest" - and invited NGOs to submit their comments for a 45-day-long period. The Nuclear Awareness Project of the Sierra Club of Canada coordinated an international NGO review of the paper, that found the AECL study extremely inadequate, partial and incomplete. NGOs also requested that the full study be made public and subjected to a fair consultation for a longer time.

On the other hand, apparently SACE from Italy is going to review the Euratom-funded EIA against its environmental guidelines before taking a final decision on the approval of a 150 million Euro (US$131 million) financial guarantee covering political and commercial risks associated with Ansaldo's operations in the Cernavoda 2 project. At this regard, the Romanian Parliament already approved at the beginning of 2002 a sovereign counter-guarantee for Export Credit Agencies financing Cernavoda 2.
At the end of January a joint Fact-Finding Mission from CEE Bankwatch and *Campagna per la riforma della Banca mondiale* visited Romania and the Cernavoda NPP in order to better understand the economic, environmental and social implications of the controversial Cernavoda 2 project – the Mission's final report is available at www.bankwatch.org. EU officials confirmed to the Mission that the rationale for the Cernavoda 2 is still unclear, alternatives have not been adequately explored and the power capacity increase is inconsistent with the EC recommendations for the Romanian energy sector reform as pre-accession conditions.

Furthermore, local NGOs informed the Mission that informal public consultations promoted in Romania by project sponsors about the project last year were attended only by "pro-nuclear" NGOs, many of which have been founded by officials currently working for State nuclear agencies.

According to the Romanian Environment Ministry, final official consultations on the Romanian EIA, which is currently being finalized by national experts, should take place in March 2002 according to the Romanian Environmental Protection Law. Only after that will the Cernavoda 2 project be environmentally and technically licensed by the Romanian government.

In the meantime construction works at Cernavoda 2 started again - after a five year halt - at the end of last year thanks to a US$80 million contribution by the Romanian government aimed at getting new foreign equipment supplies.

Source: Antonio Tricarico, Campagna per la riforma della Banca mondiale

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WHEN THE "TURBOGENERATOR OF LAST RESORT" FAILS

A recent incident at Flamanville nuclear power station in France shows yet again how vulnerable nuclear reactors are. In a scenario common to several nuclear accidents, a combination of operator error and faulty safety systems turned a relatively small problem into a major incident which damaged essential equipment.

(563.5376) WISE Amsterdam – The problem started with an error which was made during maintenance work on an electrical panel.

This panel supplies power to the instrumentation and control system – basically, the sensors and control room displays which show what is happening in the reactor, plus the electronics and switching systems that carry out reactor operators' commands, such as turning pumps on and off.

The instrumentation and control system is essential to the reactor's operation so there are two identical copies: system A and system B.

Both have backup power supplies in case the main power supply fails. Even if both the main and the backup power fails, there is a diesel generator to provide emergency power.

The reactor's designers clearly considered it extremely unlikely that all three power sources for the instrumentation and control system (main, backup and diesel generator) should fail at the same time.

Nevertheless, mindful no doubt of the disastrous consequences of a major nuclear accident, they provided an extra power source – batteries – for some absolutely vital pieces of control equipment.

At Flamanville-2 on 21 January 2002, a combination of faulty equipment and operator errors culminated in a situation where these batteries were the only power source left to instrumentation and control system A. What is more, only absolutely vital parts of the system had battery backup, so most of system A had no power at all.

Cascade of failures
The incident began when an error was made while replacing electrical

components on one electrical panel. A test revealed the error, but when operators tried to restart the faulty circuit manually, the system generated spurious commands which cut off the external power supply to system A.

Shortcomings in the instrumentation and control system prevented switching to the backup power supply or the diesel generator. As a result, there was a power loss to all of system A except the components provided with a battery backup.

The power loss to system A triggered the automatic shutdown of the reactor. However, whenever a reactor is shut down, residual heat must be removed from the reactor core, and the instrumentation and control system is needed to control this process.

The operators still had system B available for this, but it was six hours before the reactor reached cold shutdown.

To make things worse, the cooling system for the primary pump seals then failed. The power loss to instrumentation and control system A prevented automatic switchover to the back-up system.

As well as the normal and the back-up cooling systems for the pump seals, there is an extra back-up system consisting of the ominously named "turbogenerator of last resort" (*turboalternateur d'ultime secours*) connected to a pump. Its name refers to the fact that it only comes into action when all external power to system A and system B fails.

An incident that began with one electronic component ended up costing EdF an estimated 1.5 million euros (US$1.3 million).

At Flamanville on 21 January 2002, the "turbogenerator of last resort" started up, but an overload protection system then shut it down again.

The operators eventually managed to start the cooling system for the pump seals manually. By the time they succeeded in doing this, the primary pump seals had been without cooling for 1 hour 25 minutes, and the temperature had reached 76.2 degrees Celsius.

Luckily this was below the maximum allowed temperature of 95 degrees, because if the seals get hotter than this, there is a danger that they may get damaged, resulting in loss of primary coolant, which in the worst-case scenario can ultimately lead to a meltdown.

After about two hours, the operators managed to get the power working again on circuit A. But, when the power came back online, additional equipment failures occurred. An emergency feed pump for the steam generators started up, then overheated and was seriously damaged.

The cause for this is still unknown. The injection pump for cooling the primary pump seals was also damaged after it started up without lubrication.

As if all these problems were not enough, there was also a leak from the generator, and hydrogen was detected in the turbine hall. The workers had to be evacuated from the turbine hall, and extra precautions had to be taken before repairing the leak.

After all the damaged parts were replaced, the safety authority gave permission to restart the reactor on 30 January. They also ordered Electricité de France (EdF) to carry out a detailed analysis of the incident.

Initially EdF classified the incident as Level 1 on the International Nuclear Event Scale (INES), which has 7 levels. However, the French nuclear regulatory agency ASN considered the combination of faults so serious that it upgraded the incident to INES Level 2.

Conclusions

The nuclear industry is proud of its "defense-in-depth" design, and claims that it makes accidents almost impossible. However, in this case, a combination of operator error and shortcomings in the complex control systems destroyed a lot of the "defense-in-depth" as system after system failed.

An incident that began with one electronic component ended up costing EdF an estimated 1.5 million euros (US$1.3 million).

The incident raises another question: How many other reactors all over the world have similar shortcomings in their instrumentation and control systems? The question is an important one, because shortcomings that violate a reactor's "defense-in-depth" also violate its safety case.

Sources: ASN press release and technical note, 1 February 2002; *Nucleonics Week,* 7 February 2002

Contact: WISE Amsterdam

LOCAL OPPOSITION

Flamanville, together with the La Hague reprocessing plant, are situated near Cherbourg on the Cotentin peninsula, which juts out into the English Channel. Local anti-nuclear groups such as CRILAN (Committee for Reflection, Information and Anti-Nuclear Struggle) have opposed both plants for many years – decades even – with demonstrations, legal actions and suchlike. For more information, contact:

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K2/R4 NEGOTIATIONS

CEE Bankwatch Network/WISE Amsterdam - New negotiations have been held on the conditions for a loan from the European Bank for Reconstruction and Development (EBRD) for the completion of the Ukraine reactors K2/R4.

On 13 December 2000 the European Commission approved a Euratom loan of US$585 million, subject to the confirmation by the EBRD of the effectiveness of their 7 December 2000 decision on a US$215 million loan for the same project. As all conditions were fulfilled, the EBRD and the Commission decision were ready to be confirmed and the loans were expected to be signed in early December 2001.

But on 28 November 2001, some days before signing the contracts with the EBRD and European Commission, the Ukrainian Prime Minister Anatoly Kinakh requested additional discussions on certain loan conditions that Ukraine considered unachievable, and consequently refused to sign the EBRD loan contract.

On the request of Ukraine, a joint Working Group (WG) was established to explore solutions that would address the issues of their concern and render the project acceptable. The WG met biweekly until early February 2002 to discuss project cost, the Project Financing Plan, electricity tariffs, the Decommissioning Fund and nuclear liabilities and insurance. Substantial work remains to be done before a solution is fully defined.

One of the conditions which the EBRD required is an immediate hike in electricity rates, which would have meant a 30% rise in consumer rates. The issue of increasing electricity rates played an important role in the move on 28 November 2001 not to sign the contract. To agree to such an increase at that moment was impossible in the run-up to national elections scheduled for March 2002. According to Prime Minister Kinakh, the negotiations in the WG had led to agreement on reduction of the project costs and on mitigation of the bank's requirement for increasing electricity rates. The required hike in electricity rates could be smaller if the total project costs could be lowered.

Assuming the project is satisfactorily adjusted at technical level by the WG, it will have to be re-approved by all parties, a process that will require full political support. In any case, a decision is not expected until after the Ukrainian parliamentary elections of March.

Sources: *Nucleonics Week*, 3 January and 7 February 2002; CEE Bankwatch Network, 13 February 2002
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PETTEN HFR TO BE CLOSED TEMPORARILY

In our previous issue we reported about safety problems at the Dutch High Flux Reactor (see *WISE/NIRS Nuclear Monitor* 562.5366: "Petten reactor to "convert" to HEU?"). On the day of our publication, the regional newspaper *Noordhollands Dagblad* reported about a crack in the reactor vessel. That news caused more commotion and it was eventually decided that the reactor would close on 18 February for two weeks for a safety review.

(563.5377) WISE Amsterdam – More documents and information on Petten's safety problems became available as parliament members asked questions following articles in the Dutch press. On 25 January, a report from the Dutch Nuclear Physics Authority (KFD) was sent to the parliament (1).

After inspections, their main conclusion was that internal safety specifications were not followed, not mentioned in procedural lists and insufficiently known to managers of the reactor.

The KFD concluded that the license for the operation of HFR dated back to 1960 with different amendments of later date. Some incidents, like the operation for some days without a main emergency pump and a leakage of a fuel element, were considered not to be a violation of the license as the license included only little specifications for reactor operation. The internal safety specifications were, however, violated in these cases. Other incidents, like failing to make notes of reactor problems in operational journals, the lack of regular meetings between operators and management and miscalculations in a radiation experiment, were also not considered to be in violation with the license but also not in violation of the internal safety specifications (2). That the license of the HFR had not

been violated is no wonder as it is 40 years old (with some later amendments) and did not set clear requirements for reactor operation. These requirements were worked out in the internal safety specifications, which had been violated and were insufficiently known and used by the management.

The hairline crack in the reactor vessel was known since the construction of the vessel in 1984. In that year, the original vessel was replaced and a weld in the top part of the structure was not properly welded. The crack is 4 centimeters long and 2 centimeters deep (3).

During an inspection in the summer of 2001 it looked like the crack had grown. But a new sophisticated inspection method had been used so it is also possible that this method only showed the real size of the hairline crack, which appeared to be bigger than earlier assumed (4).

The results were reported to the KFD but the reactor was restarted before the KFD could give a final judgment. Then, after the restart had taken place, the KFD gave permission to operate the reactor for two months. Within these two months it concluded that the crack did not pose a serious risk to the reactor (5).

There is no immediate risk that radioactivity would be released if the crack really burst. The reactor vessel is open on the topside and is located on the bottom of the reactor basin, which is like a swimming pool filled with water (6). So, leakage is not the issue. Though one can be concerned about what could happen to the vessel structure if the upper parts broke.

On 28 January, Netherlands Energy Research Foundation (ECN) director Frans Saris sent a letter to the reactor operator company Nuclear Research & Consultancy Group (NRG) and reactor owner Joint Research Center (JRC) of the European Commission. In that letter he warned that he could not guarantee the safety for 100% and requested the provisional closure of the reactor until a safety assessment proved that resuming operations would be safe.

A meeting at the ministry of Environment four days later learned that the on-site Reactor Safety Committee had fulfilled "no serious role in the reactor's operation" and that certain tests were carried out without consulting this committee. On 4 February, minister Pronk asked NRG

FRM-2 LICENSE DELAYED

The issuing of the final license for the German Research Reactor FRM-2 will be delayed as the German federal government has rejected a draft license. The draft license was sent in August 2000 by the State government of Bavaria to the Federal government for approval. The federal Reactor Safety Commission (RSK) and the Radiation Protection Commission (SSK) studied the draft license and have late last year sent their conclusion to the federal Ministry of Environment (see *also WISE News Communique 557.5334*: "Germany: FRM-2 reactor to be converted to 'medium' enriched uranium"). On 1 February, the Ministry announced that additional requirements should be laid down in the license proposal and that only a license for an initial test period can be issued by the Bavarian state government.

According to the Ministry: certain handling procedures for emergency situations were not present in the instruction manual; there was no control system for checking on failures of fuel elements; a study on recent incident experiences in other research reactors had not been made; the risk of swelling fuel elements and eventual consequences for water cooling capabilities had not been considered; and recent developments in safety requirements were not investigated (fire protection). Special considerations were given to the use of high-enriched uranium (HEU). The FRM-2 has no plan for final storage of the weapons-grade spent fuel, after an initial period of on-site interim storage. Besides, the Ministry requires a justification for the use of HEU. The draft license has been sent back for Bavaria to include the missing issues and must be returned to the Ministry before 1 May.

The delay in the approval of the final license is also becoming a political issue. According to industry magazine *Nucleonics Week*, the Greens in the federal Red-Green government would like to prevent the issuing of the final license before the next elections in September. They fear they will lose votes if they are responsible for the opening of a new nuclear reactor. On the other side, Bavarian State Premier Edmund Stoiber will lead the Christian Democratic Union and Christian Social Union in the national elections. The strongly pro-nuclear Stoiber will certainly make an issue of the FRM-2 license delay and raise other nuclear issues.

Sources: *Nucleonics Week*, 24 January 2002; Ministry of Environment background paper, 1 February 2002; Ministry of Environment press release, 1 February 2002

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to temporarily close the reactor, which NRG agreed to do (7).

Strangely enough, Pronk had to ask NRG to voluntarily close the reactor as he has little formal powers to order a closure. As the reactor is owned by the European Community (JRC), European laws apply for the site. According to article 1 of the Protocol on privileges and immunities of the European Community, the European Community's real estate is inviolable.

This means that as the HFR is owned by the European Community, Dutch authorities are not allowed to search the premises, or take them over by requisition, confiscation or expropriation. The Dutch government would need explicit permission from the European Court of Justice before it can take any compulsory measure against JRC.

Only in case of a real emergency situation he can force a closure based on article 37b in the Dutch Nuclear Energy Law (8).

The agreed closure date on 8 February was later postponed until 18 February because NRG feared a short-term shortage of medical isotopes. Two other isotopes producing reactors in Europe, BR2 in Mol (Belgium) and Osiris in Paris (France) are shut down for maintenance work until March. Normally the reactors are geared to each other's production schedules, but a rapid closure of Petten would result in a shortage of isotopes. The minister and the parliament agreed to a delayed closure (9).

During the period of closure, a commission led by the International Atomic Energy Agency will review the "safety culture" at the HFR and make recommendations (10).

The lack of a proper license with sufficient requirements and limits for reactor operation should be solved in the next years. The conversion from high enriched uranium (HEU) fuel to low enriched uranium (LEU) fuel means that a new revised license became necessary.

This will require safety assessments and an environmental impact assessment and the process will be completed in 2004. Environment minister Pronk promised to include clearer and stronger requirements in the new license (11).

It is unknown what would happen if JRC would decide to cancel the conversion program and ask Russia to supply the HEU (see *WISE/NIRS Nuclear Monitor* 562.5366: "Petten reactor to "convert" to HEU?"). Although they still intend to convert to LEU, they nevertheless recently signed a framework agreement for 600 kilograms of Russian HEU as a kind of backup. If HEU continues to be used, the license does not necessarily have to be renewed.

In the 1990s, preventing a renewal of the license was one of the reasons for JRC to delay conversion to LEU. They were not keen on the long procedure and the challenges from environmental organizations that it would involve.

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Contact: WISE Amsterdam

RADIOLOGICAL ACCIDENTS UPDATE

After some delay, authorities have opened the radioactive package in New Orleans (see *WISE/NIRS Nuclear Monitor* 561.5357, "To U.S. from Sweden – irradiation"). The IAEA has meanwhile recovered two strontium sources that lumberjacks found in the former Soviet republic of Georgia, though other ex-Soviet sources still remain at large.

(563.5378) WISE Amsterdam – Questions still remain about the incident over the Christmas – New Year period in which a shipment of radioactive iridium-192 from Sweden to the U.S. was found to leak radiation at an alarming rate. No one knows where the package started leaking radiation on its journey from Studsvik in Sweden via Paris, France and Memphis, Tennessee, to New Orleans. Also, there are only rough estimates of what radiation doses members of the public and employees of carrier Federal Express (FedEx) received, because very few employees were carrying dosimeters.

Investigations into the incident have proceeded very slowly. The faulty package had sat around, surrounded by a makeshift "shield" of lead and concrete blocks, since early January. The high levels of radiation it was emitting meant that opening it was very difficult and required special equipment such as robots.

When the package was opened, what they found was a mess. Two of the three inner containers were open, allowing the radioactive iridium wafers to escape. Also, some of the

radioactive wafers had oxidized and were stuck to the inside of the inner container and to each other.

This was not the first time that loose lids were found on inner containers in a Studsvik shipment. Last year, a radioactive package to South Africa had the same type of problem. However, there was no leakage of radioactivity that time. Studsvik did not report the earlier incident – a violation of Swedish regulations. Swedish radiation protection officials are consulting lawyers to decide what action to take against Studsvik management for this earlier violation.

Further details of the U.S. incident showed that many people had a lucky escape. This was particularly true of the driver of the truck that took the package from Memphis, Tennessee to New Orleans. Apparently the package was at the back of his truck, so even if the package were faulty at the time, his radiation dose would have been relatively small. If it had been at the front of his truck, the consequences could have been serious.

Nearly all the radiation doses received were estimated doses, since the FedEx employees involved in transporting the package did not wear dosimeters, apart from the pilot and co-pilot of the transatlantic flight. Blood tests were carried out on fifteen FedEx employees after the incident, and the results were negative. However, these tests are only capable of detecting serious radiation damage.

Another unanswered question is why, despite current terrorist threats, the U.S. Customs Service had failed to check radiation levels on imported goods. Lawmaker Ed Markey said this showed that if terrorists had used carriers such as FedEx to import radioactive materials for a "dirty bomb", this might have gone undetected.

Georgian sources recovered

A team from the International Atomic Energy Agency went to the former Soviet republic of Georgia to recover two strontium-90 sources. These sources had been found by lumberjacks, who used them to keep warm (see box "Lumberjacks irradiated" in *WISE/NIRS Nuclear Monitor* 561.5357, "To U.S. from Sweden – irradiation"). Two of the three remain in hospital in Tbilisi in a serious condition, and the third has been released from hospital.

The sources came from portable electrical generators known as "radiothermal generators" that were widely used in the former Soviet Union to provide electricity and heat for equipment such as remote communication systems. Georgian Environment Minister Nino Chkhobadze warned that other sources, including two more of similar power to those recovered, were missing in Georgia.
Following recovery of the sources, the IAEA held a three-day technical meeting, which ended on 8 February. Participants outlined a plan of action to find, recover and safely store the missing sources, and improve the regulation of radioactive sources in Georgia. A major aim is to prevent missing radioactive sources falling into the hands of terrorists, who could use them to build a "dirty" bomb capable of scattering radioactivity over a wide area.

Many radiation sources have already been found in Georgia, including four more "radiothermal generators", one of which was found in a river bed; a variety of sources in former military barracks, and a source buried below a road close to the botanical gardens in Tbilisi.

Sources: Swedish Radiation Protection Authority press release, 11 February 2002; Studsvik press release, 8 February 2002; Platts Nuclear News Flashes, 11 February 2002; U.S. N.R.C. preliminary notification PNO-IV-02-001B, 8 February 2002; WISE-Paris note, 29 January 2002; Rep. Ed Markey press release, 16 January 2002; IAEA press releases, 5 and 8 February 2002; Reuters, 5 February 2002; *IAEA Bulletin* Vol. 41 No. 3 (1990), available on the Internet at http://www.iaea.org/worldatom/Periodicals/Bulletin/Bull413/

Contact: WISE Amsterdam or NIRS

IN BRIEF

Bush budget: plans for new U.S. reactors… Despite an overall 15% cut in the DOE's nuclear power budget request, the nuclear industry seems happy with the US$34 million added to research for a next generation of nuclear reactors. The budget includes a "Nuclear Power 2010" program, which aims to have new regulatory processes in place to initiate private sector construction of new nuclear plants by 2005, with construction and startup completed by 2010. Meanwhile, programs such as Nuclear Energy Plant Optimization and Advanced Nuclear Medicine Technologies received no budget request.
www.eenews.net, 7 February 2002

…but DOE cleanup "ineffective". The Bush budget has also described the DOE's US$6 billion a year Environmental Management Program, which involves cleanup of nuclear weapons sites, as "ineffective". The budget proposes a new US$800 million "reserve" fund to implement fundamental changes to the program. The Institute for Energy and Environmental Research (IEER) agreed that the existing program is ineffective, but feared that the extra money is likely to make the program even worse.
IEER press release, 4 February 2002

India: Rajasthan-1 to be closed. The 100 MW Pressurized Heavy Water Reactor Rajasthan-1 will close on 30 April. According to the Atomic Energy Regulatory Board, the reactor must be closed on that date due to the bad condition of the plant. Turbine blade

failures and leaks in the heavy water tank (calandria) overpressure valves were some of the problems in the reactor that reached criticality in August 1972. The decision was taken after a thorough review, which concluded that the reactor showed signs of aging. Only a full upgrade of the cooling circuit would make it possible to reopen the reactor. Operator Nuclear Power Corporation of India Ltd. is considering such an upgrade operation.
***Indian Express*, 10 February 2002**

Russian waste import protests. About 500 people blocked railroad tracks in the Krasnoyarsk region on 9 February in protest at plans to import nuclear waste. They chanted slogans as "Siberia for people and not for nuclear waste". The line had been used to transport nuclear waste from Kozloduy in Bulgaria to the Krasnoyarsk-26 complex last November. Krasnoyarsk citizens had collected over 100,000 signatures on a petition demanding a referendum, but the local electoral commission rejected nearly 60,000 of them. The number accepted (40,250) exceeds the 35,000 officially required for a local referendum. If the referendum happens, residents will be able to vote yes or no to the question, "Do you think new facilities for storage, reprocessing and dumping of spent nuclear fuel should be banned in Krasnoyarsk region?"
Interfax, 9 February 2002 (via BBC Monitoring Service); Ecodefense! press release, 7 February 2002

Temelin: shutdown after false alarm. The Temelin reactor in the Czech Republic automatically shut down on 7 February after a false alarm in the secondary cooling circuit. The false alarm in a protection system of the cooling circuit triggered other safety systems that started to inject extra cooling water into the primary circuit. The reactor automatically shut down after the injection of emergency cooling water. The State Nuclear Safety Office (SUJB) was especially concerned that the injection of the cooling water happened after a false alarm went off. According to director Dana Drabova, too many things keep failing in the secondary circuit at Temelin. She warned that the operator could face financial penalties if it happens again.
***Pravo*, 11 February 2002; Press release Austria Platform against Atomic Dangers, 14 February 2002**

China: Qinshan-2 connected to the grid. The 600 MW Pressurized Water Reactor Qinshan-2 went critical on 29 December 2001 and was recently connected to the grid. Commercial operation is expected in June.
***WNA News Briefing*, 6-12 February 2002**

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