

NUCLEAR MONITOR

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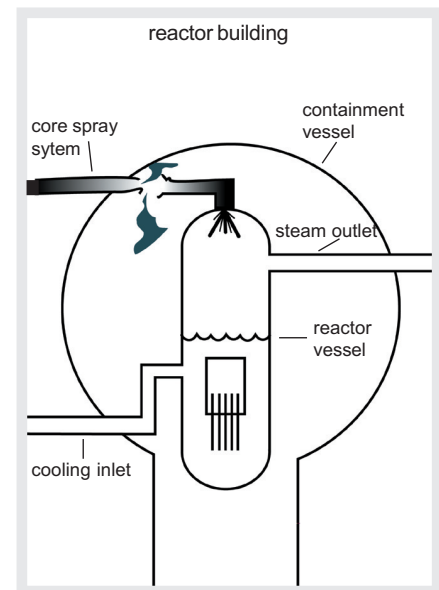
GERMANY: EXPLOSION IN BRUNSBÜTTEL REACTOR

On 14 December 2001, an explosion of a pipe occurred inside the containment vessel of the Brunsbüttel Boiling Water Reactor (BWR). The consequences could have been much more serious if the explosion had taken place closer to the reactor vessel. Serious however was that the operators only closed the reactor for inspections two months later, though the State supervising authority was informed three days after the accident. After a threat of a formal order the operator finally bowed to pressure from the State authority. The Brunsbüttel reactor has a history of technical safety problems and had been shut down several times before.

(564.5379) **WISE Amsterdam** – The explosion took place in the so-called reactor core spray system. That system sprays cold water into the reactor vessel to cool the reactor down and remove residual heat in case of shutdown. It is not an emergency cooling system but a tool to reduce by about two hours the time needed to cool the vessel in normal maintenance shut downs. The spray system situated inside the containment vessel, a steel vessel of 27 meters in diameter in which the reactor vessel itself is located. The system is connected by an isolation valve to the reactor vessel. The valve is opened to allow injection of fresh coolant into the vessel during shutdowns (1). See the diagram for a

layout of the containment vessel. The containment vessels of Brunsbüttel and some other BWRs are smaller than in most other reactors and are located in the center of the reactor building. More common is a containment building – the typical dome of a nuclear power station.

On 14 December 2001, a leakage of the spray system was indicated in the control room of the operating reactor. The reactor operators recognized a leakage but considered it of no importance to essential safety parts of the reactor. The system's water supply was cut off and the leakage stopped. The operators suspected that a flange leakage in the system had caused the



problem and they continued operating the reactor (2). Immediate inspection of the system itself was not considered necessary and neither was it possible, as the containment vessel can not be opened during operation of the reactor at 100% capacity.

Three days later operator Kernkraftwerk Brunsbüttel GmbH (KKB) informed the supervising authority of the ministry of Finance and Energy of the State of Schleswig-Holstein. The authority however was not satisfied with the conclusions of the operator. The observed

IN THIS ISSUE:

Germany: explosion in Brunsbüttel reactor	1
Estimated 17,000 fatal cancers in U.S. due to worldwide bomb tests	3
Yucca Mountain update	5
Switzerland: upcoming referendum on nuclear energy	7
Belgian nuclear phaseout	8
UK energy review keeps nuclear option open	8
Scientists argue over fusion claim	10
In brief	10



indications in the control room could not fully declare what could have happened inside the containment vessel. The supervising authority urged the shut down of the reactor but the operator refused to do so. Only after weeks of discussions, and after threatening with a formal order to shut it down, the reactor operator settled the issue on 18 February by reducing power output to 10% so that inspections were possible.

When the reactor core spray system was inspected it appeared that a 10-centimeter diameter pipe had totally disintegrated over a length of 2 to 3 meters. About 25 pieces of debris were scattered around and the 2 to 3 meters pipe was completely gone. Immediately it was decided to reduce power output to zero to conduct further inspections.

Although there is no clear explanation of the explosion, it is suspected that a hydrogen explosion occurred. Neutron radiation from the reactor core can split water into hydrogen and oxygen gas. These can then recombine explosively. Such an explosion was suspected of causing the November 2001 pipe explosion at Hamaoka in Japan (see WIS News Communique 558.5339, "Japan: a 'grave situation' at Hamaoka BWR").

The part of the pipe that exploded was close to the containment vessel wall. The consequences could have been more serious if the explosion had occurred 3 to 4 meters in the

direction of the reactor vessel. In that case, the isolation valve in the reactor vessel lid would have exploded and water would have escaped from the reactor.

The Federal Ministry for Environment, Nature Protection and Reactor Safety was only informed by the Schleswig-Holstein authority on 18 February, the day that the operator agreed to reduce power output of the reactor. The federal ministry ordered further

There had been rumors that KKB deliberately continued operation regardless of concerns about what happened inside the containment vessel.

investigations and to be informed on measures to be taken. The ministry will only allow the reopening of the reactor if the cause of the explosion is clear and a repeat is excluded, all damage is repaired and the competence of the operator is proven.

That competence is in doubt as the operator decided to continue operation after the explosion instead of starting inspections after the observed leakage (3,4,5).

State Secretary of Energy Wilfried Voigt (Greens) said that such a serious explosion had never occurred before in a German reactor and State Minister for Energy Claus Möller (Social-Democrats) stated: "Three meters farther and Brunsbüttel would never be connected to the grid again".

There had been rumors that KKB deliberately continued operation regardless of concerns about what happened inside the containment vessel. The costs of shutting down the reactor and buying electricity on the free market were apparently considered too expensive. KKB of course denied that accusation but minister Müller said he had observed

a trend towards cutbacks in the safety area among utilities. The liberalization of the electricity market could have led to such a tendency (6).

According to German magazine Der Spiegel, KKB plant managers had asked for a shutdown after the detection of a leakage. KKB owner Hamburgischen Elektrizitätswerken (HEW), part of energy concern Vattenfall Europe, however was alleged to have ordered KKB to continue operation. Acquiring replacement electricity would have cost HEW Euro 80 million (US\$70 million) (7).

The Federal Ministry of Environment ordered the German Reactor Safety authority (GRS) to check the other German BWRs (Gundremmingen, Philippsburg, Krümmel and Isar) for comparable situations (8).

Troubled history

The 806 MW Brunsbüttel BWR reached criticality in June 1976 (9). On 18 June 1978 a serious accident happened and radioactive steam was released into the environment. A blind nozzle of the main cooling system broke due to vibrations and 97 tons of radioactive steam came into the turbine room. Two tons of the steam eventually escaped into the outside air. Several changes were made in the plant and in the set up of its management. (10)

In August 1980, more than two years after the accident, the reactor was allowed to restart. But after 8 days of operation the reactor was automatically shut down due to a malfunctioning measuring probe (11). Later that year the reactor restarted.

As a consequence of the 1978 accident the pipes of the cooling system had to be replaced with ones made of a stronger steel type. The 14-month operation started in July 1982 and was estimated to cost DM450 million (then US\$185 million) (12).

The chromium-nickel-titanium alloy

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The **next issue** of the WISE/NIRS Nuclear Monitor (565) will be mailed out on 22 March 2002.





DÉJÀ VU

"Cover up, play down, conceal:
Why was the Brunsbüttel reactor
shut down so late?"

(Title from German newspaper Die
Welt after the accident in June
1978.)

Source: Die Welt, 30 June 1978

steel (austenitic steel) that was chosen in 1982 eventually appeared to be a very bad choice. During a routine inspection in August 1992 several cracks were discovered in piping and the reactor was shut down. Some of the cracks were centimeters long or reached as deep as 80% of the pipe wall. (13) More than 120 cracks were found in high-

pressure systems and in the reactor water cleaning system. The finding of "stress-related" cracks was actually not very surprising. In the early 1980s, U.S. nuclear experts had already warned of these cracks in austenitic steel after having found damage in some BWRs (14).

In February 1995, cracks were also discovered in the core spray cooling system (15) – the same system involved in the December 2001 explosion.

Brunsbüttel was connected to the grid again in June 1995 after having been shut down for almost three years. The three years of upgrading had cost DM100 million and about 160 changes to the reactor were conducted. It was the longest shutdown ever of a German reactor (16).

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Contact: WISE Amsterdam

ESTIMATED 17,000 FATAL CANCERS IN U.S. DUE TO WORLDWIDE BOMB TESTS

According to the Institute for Energy and Environmental Research (IEER), an estimated 80,000 people who lived in or were born in the U.S. between the years 1951 and 2000 will have contracted or will contract cancer as a result of the fallout caused by atmospheric nuclear weapons testing. Some 17,000 of these cases are expected to be fatal.

(564.5380) WISE Amsterdam – The IEER draws these conclusions after having analyzed a recently released government study on the effects of fallout from weapons testing. To calculate the health consequences of fallout IEER also used data from a 1997 study on internal thyroid radiation doses.

In 1997, a study by the National Cancer Institute (NCI) was released, nearly 15 years after the U.S. Congress had ordered it. Though it had been finished in 1992, it took five years before it was released. That study, Estimate Exposures and Thyroid Doses Received by the American People from Iodine-131 from Nevada Nuclear-Bomb Tests, showed that between 11,300 and 212,000 U.S. citizens were estimated

to develop thyroid cancer because of milk contaminated by iodine-131 from atmospheric weapons testing (1951-1962) at the Nevada Test Site (NTS) (see WISE News Communiqué 498.4921: "Fallout study mishandled; scientists' past raises questions"). Especially children exposed in the 1950s to fallout clouds in Idaho and Montana appeared to be at the highest risk.

After the 1997 study, U.S. Senate member Tom Harkin instructed that a second report be conducted to study more than 20 other isotopes that may have been spread as a result of the testing.

After years of stalling and obstruction, the Department of Health and Human Services finally

released a 15-page document, but only a "Progress Report" on their work (A Feasibility Study of the Health Consequences to the American Population of Nuclear Weapons Tests conducted by the United States and other Nations).

Though the Progress Report was dated as of August 2001, Senator Harkin did not receive it until February this year. A more detailed Technical Report has been completed since the summer of 2001 but has still not been released.

The Progress Report was conducted by the Centers for Disease Control and Prevention and the National Cancer Institute. It can be found at www.cdc.gov/nceh/radiation/fallout/default.htm. The report and fallout

8 March 2002, WISE/NIRS Nuclear Monitor 564 3



maps can also be found at the web site of IEER (www.ieer.org).

The now released report includes the consequences of the fallout from aboveground tests at NTS as well as atmospheric tests by countries in other regions in the period of 1951 to 1962 (U.S. tests at Marshall Islands and Johnston Atoll; Soviet tests at Semipalatinsk and Novaya Zemlya; Britain's tests at Christmas Island).

There have been atmospheric tests outside that period which were not included in the study. China for instance conducted 23 atmospheric tests between 1964 and 1980. French aboveground tests after 1962 were not included (46 in the Pacific region). The pre-1951 tests in the Marshall Islands (5) and the Soviet Union (1) and the world's first nuclear explosion in the U.S. state of New Mexico and the bombs on Hiroshima and Nagasaki were also not included. Also not taken into account were accidental ventings from underground testing. So, the present study deals with 450 atmospheric tests out of a total of 528 conducted worldwide.

Any person living in the U.S. since 1951 has been exposed to radioactive fallout, and all organs and tissues of the body have received some radiation exposure. External radiation is received for instance from radionuclides present on the ground as a consequence of fallout. Internal radiation results from the incorporation of radionuclides in the body due to inhalation or ingestion, for instance by eating contaminated food.

Radioactive iodine and strontium are two important sources of internal radiation exposure. Iodine concentrates in the thyroid and can result in thyroid cancer. Strontium is called a "bone-seeker" and is considered to be a cause of leukemia. External radiation is responsible for all kinds of cancer, including thyroid and leukemia, and the intake of other radionuclides can also result in cancer in organs.

Based on the 1997 NCI study and the now released Progress Report, IEER estimated that a total of some 80,000 people would contract cancer of which about 17,000 would be fatal (see table). The 1997 study estimated that between 11,300 and 212,000 thyroid cancers would be expected to occur from internal iodine-131 exposure. The wide range in the number predicted is caused by a high uncertainty factor in exposure pathways. According to the Progress Report, the amount of cancer cases would likely increase by about 10% if global fallout of iodine-131 was included. Although the majority of cancer cases (for all isotopes) is caused by non-U.S. tests, the contribution from iodine-131 is relatively small (the 10% increase). That is caused by the fact that iodine-131 has a short half-life (8 days) so most of the iodine-131 from overseas testing decayed before it reached the U.S.

After all, IEER estimated 50,000 cases due to iodine-131 exposure, a rounded best estimate of 11,000-212,000 estimated range, obtained by taking geometric mean. IEER assumed a 5% mortality rate which will eventually result in 2,500 cancer deaths.

Leukemia due to internal exposure is estimated to cause 550 deaths and IEER estimates that some 1000 people in total would get leukemia. The main cause of fatal cancers would be external radiation. The Progress Report mentions an expected 11,000 deaths out of 22,000 contracted cancer cases. IEER also calculated the cancer occurrence due to other internal radiation sources such as carbon-14, tritium and cesium-137. Based on the released fallout maps and dose calculations in the progress Report, IEER estimated some 6,000 cancer cases would occur, of which some 3,000 will be fatal. The numbers are summarized in the next table.

The fallout maps which have been made accessible at IEER's website show that "hot spots" due to Nevada testing in the west of the U.S. occurred as far away as the eastern state of New York and Maine. Hot spots from U.S. Pacific tests and the Soviet tests were scattered across the U.S. from the west to the east coast.

IEER urged that the government should now formulate a health and compensation strategy without any further delay. "The United States has a compensation program for Nevada

Type of cancer	Dose type	Deaths	Occurrence	Source
Thyroid	internal	~2,500 (a)	50,000 (b)	IEER estimate from NCI 1997
Leukemia	internal	550	~1,000	CDC/NCI 2001 death estimates; IEER for occurrence estimate
All radiogenic cancers	external	11,000	22,000	CDC/NCI 2001
All radiogenic cancers	internal effective dose equivalent	~3,000	~6,000	IEER estimate from CDC/NCI 2001; maps & table
Total, rounded (d)		~17,000	~80,000	

a. Estimated by IEER by assuming a 5% mortality rate from thyroid cancer
 b. Rounded best estimate of 11,000-212,000 estimated range, obtained by taking geometric mean
 c. From radionuclides such as carbon-14, tritium and cesium-137
 d. Rounded to one or two significant figures as indicated.





Test Site neighbors who are geographical downwinders. But this is clearly not enough", explained IEER's Lisa Ledwidge, "There are hot spots thousands of miles from tests sites and the new definition of 'downwinder' should include all of them".

As atmospheric weapons tests had caused hot spots over many countries, the IEER pleads for a Global Truth Commission to be set up by the U.N. that would examine in

detail the harm that has been inflicted upon the people of the world by nuclear weapons production and testing.

Sources: The Bulletin of the Atomic Scientists, November/December 1998; Progress Report: A Feasibility Study of the Health Consequences to the American Population of Nuclear Weapons Tests conducted by the United States and other Nations, August 2001; Press Release IEER, 28 February 2002; Fact Sheet on Fallout

Report and Related Matters (IEER), 28 February 2002; website senate member Tom Harkin (Democrat): www.senate.gov/~harkin, 1 March 2002

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YUCCA MOUNTAIN UPDATE

Most people send flowers or chocolates for Valentine's Day. U.S. Energy Secretary Spencer Abraham sent Nevadans a high-level nuclear waste dump, and 50 million Americans in 44 other States the prospect of up to 100,000 high-level atomic waste trucks and trains passing by their homes.

(564.5381) NIRS - On 14 February, Abraham sent his official recommendation that the United States' irradiated atomic fuel and high-level radioactive wastes be buried at Yucca Mountain. But Abraham's move had been expected since 10 January, when he had notified Nevada Governor Kenny Guinn of his intentions.

What shocked even the most hardened watchdogs of the 20+ year long fight against the Yucca dump was George W. Bush's immediate approval of the plan. Bush was supposed to review Abraham's recommendation, an 80 pound document containing two decades worth of (incomplete, inadequate, and weak) Department of Energy scientific studies, as well as tens of thousands of public comments, mostly opposed to the Yucca dump. Bush slept on it, and approved the plan the next day, 15 February, sending his recommendation to Congress.

What happens now is governed by the Nuclear Waste Policy Act of 1982. This Act was first amended in 1987 to "screw Nevada," that is to single out Yucca Mountain – for reasons of political vulnerability, not scientific suitability – from the numerous potential dumpsites in other States

previously under consideration. It was then amended again in 1992, ordering the Environmental Protection Agency to re-write more "reasonable" dump site radiation release regulations, because the poor geology at Yucca couldn't live up to the old rules.

Under the Nuclear Waste Policy Act, Gov. Guinn has 60 days in which to veto the president's approval. Guinn has indicated he will use the full 60 days, to delay the Yucca steamroller as long as possible in order to give Yucca opponents more time to organize resistance, then issue his veto around mid-April.

In coalition with national environmental and public interest organizations, NIRS/WISE is organizing a rally on the U.S. Capitol steps on April 16. At the end of the rally, grassroots activists from across the U.S. will go to the offices of their Members of Congress to urge them to uphold Nevada's veto and vote against the Yucca Mountain dump.

Congress must then act to override Nevada's veto within 90 days of continuous session (legislative working days), or else Yucca is defeated. The nuclear power industry has no intention of letting that happen. Already, pro-Yucca lobbyists

are swarming on Capitol Hill. The American Nuclear Society has called upon its members to lobby Congress on March 5. Local elected officials from nuclear reactor communities are coming to Washington, D.C. on March 6 to urge their Members of Congress to approve Yucca. This is in addition to the army of professional lobbyists the Nuclear Energy Institute pays to promote the Yucca dump in Congress on a regular on-going basis.

The Republican-controlled House of Representatives, led by Speaker of the House Dennis Hastert (whose district in Illinois is home to nuclear power giant Exelon's global headquarters) intends to try to override the veto as soon as possible, perhaps dispensing entirely with any committee review and rushing the measure to the floor for an immediate vote even before the end of April.

Incredible but true, pre-vote debate in the House will be limited to 2 hours, despite the more than 10,000 human generations that will be impacted by high-level nuclear waste (the hazard of plutonium persists for 240,000 years or longer).

In the Democratic-controlled Senate, pro-Yucca dump forces face a bigger



challenge. The powerful Assistant Majority Leader happens to be Senator Harry Reid of Nevada, a fierce opponent of Yucca.

The Majority Leader, Sen. Tom Daschle of South Dakota, has vowed that, "so long as Democrats control the Senate, Yucca is dead." Ordinarily, the Senate Leadership could kill Yucca by simply not allowing it to come to the floor for a vote. But changing the rules seems to be the name of the game when the politically powerful nuclear industry is involved.

Although Reid and Daschle may be able to delay the vote for up to 60 days by tying it up in Senate committees, they may not be able to block it for the full 90 days. It's possible that pro-Yucca Senators could force an override vote to take place as early as April, although July is more likely; the vote could be delayed until the Senate returns in September from its month long summer recess.

NIRS/WISE, along with Public Citizen and a coalition of grassroots groups, is organizing a grand mock nuclear waste cask tour for the late spring/early summer. Not one, but six full-scale replica atomic waste transport containers will hit the road, visiting dozens of key States in the Congressional battle, educating the public that atomic trains and trucks – by the tens of thousands – are heading their way, unless they act now to stop them in their tracks.

The mock casks will form a convoy, traveling down the highway together, warning communities that if the Yucca Mountain dump opens, six irradiated fuel shipments **per day** for 30 years would travel U.S. roads and rails.

Several lawsuits against the Yucca Mountain Project are already underway in the federal courts. NIRS/WISE and a coalition of environmental groups, along with the State of Nevada, have sued the Environmental Protection Agency

over its weak Yucca radiation release regulations. Nevada has also sued DOE over significant changes to Yucca's 17 year old site suitability guidelines just two months before Bush Administration approval of the dump.

The State has numerous additional lawsuits in the works. An ultimate "state's rights" case before the U.S. Supreme Court is a distinct possibility. These numerous lawsuits could significantly delay and even defeat the Yucca Mountain Project.

Only if Nevada's veto is overridden in Congress and the numerous lawsuits are sufficiently resolved can the Department of Energy then submit a dump license application to the Nuclear Regulatory Commission (NRC) during 2003. NRC could take three to four years to review the application.

The mock casks will form a convoy, traveling down the highway together, warning communities that if the Yucca Mountain dump opens, six irradiated fuel shipments **per day** for 30 years would travel U.S. roads and rails.

If NRC grants a construction permit in 2006, DOE claims Yucca could begin accepting wastes as early as 2010 – or earlier, if DOE gets permission to set up a dry cask storage facility at the foot of Yucca Mountain.

The U.S. General Accounting Office (GAO), the investigative arm of Congress, doesn't share DOE's optimism: GAO estimates the earliest Yucca could accept waste is 2015

The nuclear industry tried, but failed, to push dry cask storage at Yucca through Congress from 1996 to 2000. Their "Mobile Chernobyl" bills were beaten back time and again, marking a tremendous grassroots victory, which has set the stage for the upcoming ultimate Congressional

showdown.

On a related note, GAO has filed a lawsuit against Vice President Dick Cheney, seeking the release of still-secret information about meetings between Cheney's Energy Task Force and energy industry executives, as from Enron, which led to the formulation of the Bush/Cheney National Energy Policy. Sen. Reid has joined GAO's lawsuit against Cheney, urging the court to order the release of the hidden documents, which may reveal whether nuclear power industry executives met with Cheney on Yucca Mountain.

Although the fight against Yucca Mountain has already lasted 20 years, and could drag on for years to come, the next several months are critical.

To kill the Yucca dump in Congress will take a Herculean effort: U.S. readers, please flex your democratic muscles! Contact your Members of Congress and urge them to vote against the Yucca dump and the Mobile Chernobyl shipments it would launch. Phone the U.S. Capitol Switchboard at 202.224.3121 to be plugged through to your Senators and Representative, or write: The Honorable (full name); US Senate; Washington, D.C. 20510; or The Honorable (full name), US House of Representatives, Washington, D.C. 20515.

Sample letter can be found at www.nirs.org. It may be best to send your letters to Congress directly to NIRS/WISE Washington, D.C. office so that we can hand-deliver them: Congressional mail is sometimes arriving three months late (not to mention irradiated) due to the anthrax scare!

Source and contact: Kevin Kamps, Nuclear Waste Specialist, NIRS (kevin@nirs.org)



SWITZERLAND: UPCOMING REFERENDUM ON NUCLEAR ENERGY

Switzerland is one of many countries looking to get out of nuclear power. The government has responded to an upcoming referendum on the issue, organized by NGOs, by proposing their own law to limit how long reactors can operate and call a halt to reprocessing.

(564.5382) Philippe de Rougemont - Switzerland is the fourth country in the world for the proportion of electricity from its five nuclear power plants (NPP), after France, Lithuania and Belgium. At the same time it benefits from a rich renewable energy source coming from hydroelectric dams in the Alps.

Hydroelectricity provides the country with 60% of its electricity needs, and additional river turbines can be installed on Switzerland's numerous rivers. It is neither technological know-how, neither an educated workforce that are missing.

The only missing element for Switzerland to phase out its nuclear program and to develop energetic efficiency and renewable technology is a binding political decision.

The Swiss direct democratic system enables civil society to write a new article for the constitution, have it signed by 100,000 citizens and handed over to the federal state for an upcoming national referendum. If a majority of the electorate and cantons vote in favor of the proposed text, the article is integrated into the federal constitution and becomes the framework for all future legislation.

The Swiss chapters of Greenpeace, World Wide Fund for Nature (WWF), International Physicians for Prevention of Nuclear War/Physicians for Social Responsibility, Friends of the Earth (ProNatura), together with the Greens, the Socialist party and many other political parties and NGOs, compose the Swiss antinuclear coalition. The coalition has been the initiator for 3 major popular votes on NPPs since 1984.

Each time two proposals were presented: a moratorium proposal and a phase-out proposal. The moratorium proposal obtained 46% support in 1984 and became part of the constitution after the 1990 referendum in which the vote was 54,5% in favor. The 1990 moratorium ended in 2000, but since then no new NPPs have been planned. The planned phase out received 44.5% support in 1984 and 47% in 1990.

The proposals for the coming referendum consist of a "Moratorium Plus" scenario and a planned phase-out scenario.

The "Moratorium Plus" scenario would impose:

- 10 year moratorium on new NPPs;
- 40 year limit on the running of NPPs (closing down of the last nuclear plant in 2024) with a single prolongation possibility of 10 years, but submitted to popular decision;
- labeling of energy source for consumers.

The planned phase-out scenario :

- 30 year limit to the running of NPPs (first NPPs to be shut down in 2004, last NPP in 2014);
- end to the reprocessing of spent nuclear fuel (no new reprocessing contracts after existing contracts come to an end);
- consultation of populations affected by the planned disposal of nuclear waste;
- financial responsibility for the shutting down of NPPs to be taken by the companies running them.

The coming vote in spring 2003 gives the opportunity to liven up the debate on atomic energy, to repeat a

10 year moratorium, to halt reprocessing of spent fuel and close the last of the 5 Swiss NPPs by 2014. It would be highly preferable and possible to plan an earlier phase-out, but the chance of obtaining a majority would fade with the shortening of the schedule.

The governments' response to these 2 constitutional initiatives is a counterproposal in form of a new law on nuclear energy. The law proposes a 40-year limit on the running of NPPs, a labeling of electricity source for the consumer and an end to reprocessing. We can already see the influence that the planned vote has had on the governments' planned policy.

The parliament is currently debating and amending the proposed law. The nuclear lobby has been active in parliament to reverse the governments proposed end to reprocessing contracts with Cogema (La Hague) and BNFL (Sellafield) and to lift any time limit on the exploitation of NPPs. The only way to put an end to the nuclear industry will be to vote two times yes in 2003.

The outcome of the vote will be very difficult to guess. 16 years separates the public opinion from Chernobyl and 12 years from the last federal referendum campaign on nuclear energy. On the other hand, Switzerland is part of the last 4 remaining countries in Western Europe which have not yet decided to shut down their NPPs (along with Finland, Great Britain and France).

Also, progress in non-nuclear energy generating systems has been fast growing, and have become



competitive, mostly when compared to the costs linked to the nuclear system : Nuclear fuel extraction processing and transport, growing security investments, waste conditioning and stewardship, unbearable insurance coverage...

Obviously, the nuclear lobby will be spending as much as will be necessary to spread a message of fear in the media, in order to convince the voters that without "our" 5 NPPs, we will have to import nuclear energy from France, that it will cost 60 billion euros (sic !), and that reprocessing equals recycling (sic !).

The anti-nuclear coalition will be repeating for the new generations of voters that renewable energy sources (combined heat/energy generators, geothermal, solar and wind power) can and must replace what is the most dangerous legacy of the 20th century. Also, we will be stressing the fact that the rational use of energy resources without diminishing our daily comfort is feasible and cost-effective.

The outcome of the Swiss referendum in 2003 will have a strong international repercussion on national debates elsewhere. We

thank you in advance for any form of help that could participate to a strong and successful campaign in the coming vote.

For more information, see the web sites www.sortirdunucleaire.ch (Swiss anti-nuclear coalition web site in French. Under construction, will be online in April) and www.negawatt.ch (Swiss anti-nuclear coalition web site in German).

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BELGIAN NUCLEAR PHASEOUT

The Belgian cabinet has agreed a bill that will be sent to the federal parliament to phase out nuclear power. The proposals include a maximum lifetime of 40 years for existing reactors plus a ban on new reactors.

(564.5383) **WISE Amsterdam** – Belgium's seven operating nuclear reactors generate around 60% of the country's electricity, so phasing out nuclear power in Belgium is no small affair. Indeed, the 1 March agreement by the Belgian cabinet followed failed attempts earlier in the week to agree a text. The final text includes a "force majeure" clause, which allows the government to make an exception if the country's electricity supply is under serious threat.

A commitment to phase out nuclear power in Belgium formed part of the coalition agreement between the Greens, Socialists and Liberals in 1999 (see WISE News Communiqué

515: "In Brief"). It was also one of Prime Minister Guy Verhofstadt's pre-election pledges. Last October, the government confirmed its intentions to introduce a nuclear phase-out law before December 202 (see WISE News Communiqué 556, "In Brief").

German environment minister Jürgen Trittin welcomed the Belgian phase-out agreement, saying that it showed that Germany is not alone in phasing out nuclear energy. At the same time, it leaves neighboring France even more isolated.

Interestingly, the French nuclear industry's alarmist claim that getting rid of nuclear power would mean a

"return to candles" is not heard so much in Belgium.

Instead, concerns have focused on a possible need to rely on imported gas, which would mean that if gas prices rose, electricity prices might also rise. Olivier Deleuze, Secretary of State for Energy and Sustainable Development, countered this by pointing out that electricity in Belgium is currently amongst the most expensive in Europe, and it's 60% nuclear.

Sources: Reuters, 4 March 2002; Le Soir, 1 March 2002; Le Monde, 2 March 2002

Contact: WISE Amsterdam

UK ENERGY REVIEW KEEPS NUCLEAR OPTION OPEN

The Cabinet Office's Performance and Innovation Unit (PIU) has published the result of its long awaited review of UK energy policy looking 50 years ahead. There had been a lot of speculation about what it would say - with some predicting that it might sanction the construction of 10 new nuclear plants.

(564.5384) **Dave Elliott** - In the event, the PIU simply left the option open for nuclear companies to come forward with funding proposals if they so wished, but said it would not provide public money. It was not

moved by the argument that more than three-quarters of UK nuclear capacity, 9GW, is due to close by 2020. "The electricity industry has had to cope with this scale of replacement and can do so again. A

wide range of technologies is available: gas-fired stations; renewable power; combined heat and power (CHP); coal-fired stations; energy from waste resources; coal mine methane."





The PIU conclude "there is no current case for public support for the existing generation of nuclear technology" but add "there are, however, good grounds for taking a positive stance to keeping the nuclear option open."

Following this last line up, the PIU suggested that government support for non-fossil options, such as market based carbon crediting systems, should be extended to any new nuclear projects that emerged "in order to provide incentives to the industry".

But, it did not, as some had expected, suggest that nuclear power should be exempted from the Climate Change Levy, possibly since that would yield only a 0.43p/kWh (0.6 cent/kWh) price reduction, whereas, in its submission to the PIU, British Energy asked for a 1p/kWh (1.4 cent/kWh) subsidy. In total British Energy have estimated that CCL exemption would only be worth £2 million (US\$2.8 million) a year, and has said that it would require other public subsidies and financial changes before it would invest in a new nuclear plant.

Some commentators had been worried that the relatively critical line on nuclear power in the draft text of the report would be watered down in the final version. Certainly some of the more colorful language seems to have disappeared.

For example, the leaked version of 10 December 2001 depicted nuclear as a technology with "an uncertain role", since "concerns about radioactive waste, accidents, terrorism and proliferation may limit or preclude its use".

However, although this comment has been deleted, the final published version still seems quite critical, arguing that "because nuclear is a mature technology within a well-established global industry, there is no current case for further government support." But it did feel that it was wise to keep the nuclear option open, in case renewables, CHP

and energy conservation failed to deliver as planned.

However, the PIU seemed very confident that these new options would deliver. The headline commitment is the proposal that the UK aim to obtain 20% of its electricity from renewables by 2020. Strong commitments are also made to CHP and to energy efficiency, with targets for the latter being a 20% cut in demand by 2010 and a further 20% cut by 2020.

Opening up options like this is certainly one of the main concepts in the PIU report. It seeks "the promotion of technological innovation to create and keep open options to meet future challenges; and to maintain flexibility in the face of uncertainty; and the need to avoid locking prematurely into options that may prove costly in future".

That's evidently the main reason they are cautious about nuclear power. They do not want to lock in to a large inflexible nuclear program, with its long lead times, certainly not at present. They note that the proposals put to them by the nuclear industry were for a large 10GW program of new build.

Replying directly to the nuclear lobby's call to "replace nuclear with nuclear" the PIU say "there is no requirement, in system terms, to replace any particular generation technology with the same type of generation".

They were also clear that nuclear remained an expensive option, with the projected cost by 2020 being 2.5-4p/kWh (3.5-5.6 cents/kWh) based on "a mix of PIU and industry analysis" (although it's rendered as 3-4p/kWh in an Appendix to the report, this presumably being the PIU energy team's estimate).

However, it might improve with new technology, although they saw that as 15-20 years away. Then there was the problem of public acceptability. This, they said, in slightly

patronizing terms, "may or may not constitute a serious problem" but "may improve if there is a more obvious need for the technology".

Given this sort of comment it is hardly surprising that some of the responses from the UK environmental lobby were less than flattering.

Groups like Friends of the Earth had already indicated a commitment to fight any hint of backsliding on nuclear by the Labour government-which after all does have a policy of "diminishing reliance" on nuclear.

Greenpeace chastised the PIU for not shutting the door to nuclear, and were clearly unhappy with the role played by the Energy Minister, Brian Wilson, who is well known to be pro-nuclear, and who was on the PIU steering group.

BRITISH ENERGY ASSESSES "LEGO" REACTOR

British Energy signed an agreement with BNFL on 26 February to assess the suitability of the AP1000 advanced pressurized water reactor from Westinghouse (part of BNFL) to replace existing reactors as they reach the end of their planned operating lives. BNFL claim that the reactor could be constructed in just 36 months in a modular fashion, "just like Lego" (a children's building set).

British Energy signed a similar agreement announced last November with Atomic Energy of Canada Ltd (AECL), designers of the CANDU reactor. British Energy run the UK's Advanced Gas-cooled Reactors (AGRs) and the country's only Pressurized Water Reactor (PWR), Sizewell B, as well as running CANDU reactors through their Canadian subsidiary Bruce Power.
BNFL/British Energy press release, 26 February 2002; Nucleonics Week, 28 February 2002





Wilson clearly has other ideas. He commented "The report is not about renewable versus nuclear, it is about balance and promoting innovation in new technologies. It stresses the potential for renewables and energy efficiency but also argues that the options of new investment in nuclear power and cleaner coal should be kept open."

The Labour Party's green group SERA said they were "disappointed that the Energy Minister will not put the final nail in the nuclear industry coffin, despite clear analysis from the Cabinet Office Energy Review that that a combination of energy

efficiency, CHP and renewables can address Britain's energy security problems and deliver the major reductions in greenhouse gas emissions".

They added "We are very concerned that all mention of the risks of reactor accidents and nuclear proliferation seem to have been deleted from the report at a late stage".

So what next? The PIU report was a report to the government, and there is to be a period of public consultation followed by a White paper in response from the

government in October.

Meanwhile the PIU report is available in PDF format at: <http://www.piu.gov.uk/2002/energy/report/TheEnergyReview.PDF>

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SCIENTISTS ARGUE OVER FUSION CLAIMS

A paper published in Science magazine claims to have achieved nuclear fusion in a "tabletop" experiment using collapsing bubbles of gas. The affair has caused a flap similar to the discredited "cold fusion" claims of 1989, with claims and counter-claims from scientists in the field as to whether the experiment really worked.

However, this was no "cold fusion" experiment. For a start, the experiment was actually designed to achieve, on a microscopic scale, the temperatures of millions of degrees at which nuclear fusion is predicted to occur. The controversy revolves over whether fusion did or did not occur under these conditions, which illustrates once again the uncertainties in current nuclear fusion research.

Secondly, the "tabletop" experiment was very much a nuclear experiment. It was carried out at the US nuclear research establishment at Oak Ridge, and involved the use of fast neutrons, either from a plutonium-beryllium source or a pulsed neutron generator. These neutrons were used to bombard a solvent (deuterated acetone) which was simultaneously subjected to ultrasound in order to create the bubbles, which then collapsed producing extremely high temperatures for very brief time periods.

Nevertheless, the experiment does share some of the problems of "cold fusion": other scientists repeating the experiment with negative results, accusations and counter-accusations, journalists exaggerating the story and scientists fearing that the whole thing might turn into a fiasco. Officials at Oak Ridge, where the experiment was carried out, even tried to pressurize Science magazine to delay publication. Donald Kennedy, editor of Science, rejected this, saying that "we see no good reason for abandoning our plans to publish the paper, and we can see no merit whatsoever in the efforts to discredit it in advance."
Science, 8 March 2002 (pre-publication excerpts from www.sciencemag.org)

IN BRIEF

U.S. NRC orders security upgrades.

The U. S. Nuclear Regulatory Commission (NRC) has ordered security on the nation's 104 nuclear power reactors to be upgraded (see WISE/NIRS Nuclear Monitor 563.5372, "Security upgrades for U.S. reactors; waste casks vulnerable to attack"). Reactor operators have until 31 August 2002 to make the changes, and must notify the NRC within 20 days of the 25 February order if they have problems complying with the order. The actual changes were not

made public, but include extra guards, physical barriers and checking vehicles "at greater stand-off distances". Edward Markey, member of Congress for Massachusetts (Democrats), described the measures as "too little, too late".

Nucleonics Week, 28 February 2002

France: "state lie" about Chernobyl contamination. Independent radiation specialists CRII-Rad have denounced the French authorities'

handling of Chernobyl contamination as a "state lie" after seeing government documents from 1986. The documents were seized by police last November as part of the court case which thyroid patients brought against the French state (see WISE News Communique 559, "In Brief" and 556.5327, "France: Thyroid patients in court in Paris"). They reveal, amongst other things, that the Interior Ministry crisis team decided to ignore evidence of high contamination, such as a reading

10 WISE/NIRS Nuclear Monitor 564, 8 March 2002



from a May 12, 1986 sample of sheep's milk in Corsica which contained iodine-131 at twenty times the European Union limit. Instead of telling people not to use the milk, they decided to recommend local prefects to "discourage private (radioactivity) measurements". CRII-Rad is refusing to participate in a new working group alongside the new Institute for Radioprotection and Nuclear Safety (IRSN), recently formed by the merger of two government bodies of which one, the French radiation protection office (OPRI – formerly SCPRI) had been involved in the 1986 cover-up.
Nucleonics Week, 28 February 2002

Russia: more Krasnoyarsk signatures rejected... The election committee of the Krasnoyarsk region of Russia has now rejected more of the signatures collected by local citizens in support of an antinuclear

referendum (see WISE/NIRS Nuclear Monitor 563, "In Brief"). Around 90% of the signatures have now been rejected, taking the number of valid signatures below the minimum needed to hold a referendum. Ecodefense!/WISE-Russia said this shows that "democracy and nuclear energy can not exist at the same time and place".

Anti-Atom Press (Ecodefense!), 21 February 2002

... and Duma passes waste import legislation. On 6 March, the Duma (Russian parliament) passed a bill detailing how nuclear waste import proposals must be sent to a special commission for approval. The bill has now been sent to the Federation Council (the upper house of the Russian parliament) for approval.

RIA News Agency (via BBC Monitoring Service), 6 March 2002

Chinese reactor starts up. The 984MW Lingao-1 reactor has achieved criticality. China's fifth power reactor is very similar to the two nearby Daya Bay units, also built by Framatome.

World Nuclear Association, 1 March 2002

Russian waste site unguarded. A Russian legislator warned on 15 February that nuclear waste sites in Russia were virtually unguarded. The member of the Yabloko Party and two members of Greenpeace had entered a high-security waste processing plant in Zheleznogorsk, near Krasnoyarsk in eastern Siberia. The Yabloko member warned that this showed that terrorist groups could easily gain access to dangerous nuclear waste.

UPI, 15 February 2002

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WISE/NIRS NUCLEAR MONITOR

The Nuclear Information & Resource Service was founded in 1978 and is based in Washington, US. The World Information Service on Energy was set up in the same year and houses in Amsterdam, Netherlands. NIRS and WISE Amsterdam joined forces in 2000, creating a worldwide network of information and resource centers for citizens and environmental organizations concerned about nuclear power, radioactive waste, radiation, and sustainable energy issues.

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