

NUCLEAR MONITOR

A Publication of World Information Service on Energy (WISE) and the Nuclear Information
& Resource Service (NIRS), incorporating the former WISE News Communiqué

#600

December 19, 2003

BUAN VICTORIOUS AS WASTE DUMP PROPOSAL RETRACTED

The South Korean government abandoned its efforts to forcibly implement plans for a national nuclear waste facility at Wido an islet off the west coast of Buan County, North Jeola Province on 12 December. After a six month-long dispute with county residents over the construction of South Korea's first nuclear waste dump, the government now intends to seek additional regions willing to provide a site for the controversial facility.

(600.5561) Scientific Consulting for Energy and the Environment - "We recognize that the opinions of the public have not been reflected sufficiently in our choice of site, so we decided to adopt a voting system and accept a fresh round of bids from other interested regions," Minister of Commerce, Industry and Energy Yoon Jin-sik said.

Since 1986, the South Korean government has unsuccessfully tried to find a suitable site for final waste disposal, in the face of extreme resistance from residents of candidate sites.

The country is the 6th largest producer of nuclear energy in the world with 40 % of its electricity is supplied by nuclear. (See also *WISE/NIRS Nuclear Monitor* 583.5492: "Nuclear waste dumpsite issue in South Korea")

In July 2003, after just one month of geological assessments, the government confirmed Wido, as the

choice for the nation's first final nuclear waste storage site, ignoring the obvious geological facts, such as the underwater fault lines.

The inhabitants of the Buan County gathered in unprecedented numbers to show opposition to the decision.

Demonstrations, rallies and actions in the last months drew tens of thousands of participants. Residents wore yellow clothing with anti-nuclear emblems and displayed thousands of yellow flags in protest against the planned waste disposal facilities.

The scale of the demonstrations helped residents recognize their power as protestors and the courage and spirit shown galvanized the nation.

Around the clock negotiations, press conferences, information brochures and resistance actions ensured that the protests were the main media topic in Korea.

The government response was to send 8000 policemen, transforming Buan into a fortress. (See *WISE/NIRS Nuclear Monitor* 591.5535: "Massive actions against proposed South Korean waste dump")

Although non-violent resistance is one of the highest goals of the protest movement in Buan, the police in attendance were not governed by the same principles. At least 400 demonstrators, including children and the elderly, were hurt in clashes with riot police whose aluminum riot shields, with knife-sharp edges, caused numerous injuries.

The "International Forum for Nuclear Waste Disposal" organized by KFEM (Korean Federation for Environmental Movement/Friends of the Earth Korea), No-nuke Buan People's Alliance and Won-buddhism was held in Buan from 25-27 November.

The purpose was to provide information on nuclear waste issues worldwide and to refute government and industry claims that, for example, plutonium is safe to eat, spent fuel is a renewable resource and that the rest of the world successfully operated nuclear waste disposal facilities.

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ITALY'S QUEST FOR A NUCLEAR WASTE SITE CONTINUES

Ultimately, it was the weather that passed the final judgment. Following a 15-day popular uprising in November, the small southern Italian town of Scanzano Jonico and its supporters, defeated government plans to site a national nuclear waste dump there. Last week it took just 24 hours of rain to prove the point.

(600.5562) Linda Gunter for NIRS - As locals struggled to salvage possessions from the floodwaters, the now infamous waste site at Terzo Cavone lay under water, the road leading to it impassible. The "safest site in the country", the "nuclear cemetery", had gone to a watery grave.

The choice of Scanzano, the first and only site named to date, "came like a lightning bolt," said local World Wildlife Fund representative Tonino Colucci.

The close proximity of the Trisaia research center, where nuclear processing work was conducted, had sparked rumors that Scanzano might be named. However, exclusion criteria in a special report on radioactive waste storage released by the

government, seemed to rule it out.

The town and the region of Basilicata mobilized instantly and protests culminated in an unprecedented march of 100,000 on 23 November. Faced with a tidal wave of opposition, the Berlusconi government beat a hasty retreat.

Scanzano was dropped as the dump and, in early December, the government declared it would keep all low- and intermediary-level wastes on site. Only high-level waste would be moved to a repository, to be chosen in 12 months.

General Carlo Jean, the Special Commissioner for the dump project, was abruptly relieved of his duties one day after addressing a nuclear waste

briefing held by Greenpeace Italy in Rome. Jean's background as a Freemason and former secret service man added to suspicions that the whole project would be a military undertaking clouded in secrecy.

Why had the Berlusconi government failed to anticipate such opposition? What they overlooked, locals say, was the unique history of the area, where the stories of rebellious brigands remain as locked in the collective memory as the more recent struggle to salvage a salty clay wasteland and turn it into a fertile valley dripping with fruit trees, vineyards and olive groves. Tourism soon followed and today, despite severe unemployment in much of the region, Scanzano, nestled on the Ionic Sea, thrives.

In the past, Basilicata had been a place of emigration, politically quiet, poor and largely rural. Now, after working the land, people are able to settle there. "We have built our little corner of paradise", said Nicola Vassallo, a public official from the nearby town of Nova Siri. "People made this place. They've had a very hard life. Finally, they have their paradise and then the government tried to dump hell on them. That's why they rose up."

Intrinsic to the fight was a sense that the north was once again victimizing the south. Mostly, it was a sense of outrage at the military-style imposition of the decree that named Scanzano, issued without public consultation or environmental impact studies. The Battle of Scanzano was, more than anything, a fight for democracy.

Today, the people of Basilicata know they have the momentum. "We've set a precedent that the piazza decides the agenda," said Vassallo. Inspired by

ITALY AND SELLAFIELD

Following a three-day trial on charges of malicious damage, Martin Forwood, campaign coordinator of CORE (Cumbrians Opposed to a Radioactive Environment) was found guilty of obstructing a railway engine at Barrow Docks. He was ordered to pay a fine of GBP 250 (US\$ 440) and GBP 1500 (US\$ 2,650) towards his legal costs but was not ordered to pay any prosecution costs.

The judge, Peter Openshaw QC, said that while Forwood's actions could not be legally excused he did not doubt the sincerity of the campaigner's views. He also acknowledged that the campaigner had conducted himself with dignity and restraint during both protest and trial.

On 15 April, Forwood locked himself onto a railway line protesting against the arrival of a consignment of Italian waste (originally from Garigliano

power station which closed in 1982) destined for reprocessing at Sellafield's THORP plant.

Local groups in Italy had also attempted to halt the first controversial shipment in April and later in September, 27 Greenpeace activists were arrested during another protest. The European Parliament was presented with a petition this summer calling for a ban on any further transport and reprocessing of Italian fuel. Since April, three more shipments have arrived at Sellafield and nine more are expected in 2004.

Following his conviction, Forwood said "I feel no guilt for an action that has drawn public attention to the illegal import by BNFL of foreign nuclear waste. The protest was just the start of a campaign to get this trade banned.

CORE press release 8 December 2003

25 YEARS AGO

NIRS and WISE both celebrate their 25th anniversaries this year. This is the fifteenth article in a series, "25 years ago", comparing anti-nuclear news "then" and "now", to mark our first quarter-century of anti-nuclear campaigning.

Then

In issue 3 of *WISE Bulletin* we wrote: "Local opposition is beginning, despite the lack of public debate, against the South Korean government's plan for a vast nuclear programme. The target is no less than 46 nukes by the year 2000! There are reasons to suspect the South Koreans may have their eye on a bomb-making capacity." (*WISE Bulletin* 3, December 1978)

Now

South Korea's nuclear program was in its beginning supported by the U.S. Between 1955-1977 several Koreans were trained in the U.S. and the first power reactors were of Westinghouse design. Kori-1 was the first operating NPP (1978). The attempt to obtain a reprocessing plant from the French in the mid-1970s raise concerns about nuclear weapons development in Korea. (*The Nuclear Fix*, WISE, 1981)

The decision to develop a nuclear weapon was made in 1971-1972. Besides negotiations with France, South Korea also tried to obtain technology and material from Belgium and U.S. industry. Certainly helpful was the development of its civilian nuclear program, creating the necessary infrastructure and technical capability to support a weapons program.

Under pressure from the U.S., the Koreans officially abandoned the weapons program in 1975 on condition that the U.S. stopped Army troop withdrawals from the Korean Peninsula. However, strong evidence exists that the program continued until 1979, when President Park Chung-Hee was assassinated and a new government came to power. (*South Korea country profile*, SIPRI, 2003, projects.sipri.se/nuclear/cnsc3kos.htm)

Currently, 18 power reactors operate with a total capacity of 14,920 MW (14 PWRs and 4 CANDUs). Under the present "5th long term power development plan" (2000), eight more reactors are to be opened by 2015 (*Nuclear Power in South Korea*, Uranium Information Center, November 2003). The IAEA only mentions two reactors under construction (www.iaea.org).

In July 2003, following more than 15 years of unsuccessful attempts, the government appointed Wido Island (Buan County) as final disposal site for nuclear waste. This raised massive and successful resistance and eventually on 12 December the government abandoned the proposal (see elsewhere in this issue).

Scanzano, Italians are uniting in nuclear cities across the country to ensure that an open, democratic, scientific process, not a dictatorial decree, will decide the future of Italy's radioactive waste.

They have rejected the illusions of transmutation and reprocessing and are learning that the two U.S. dumps, WIPP and Yucca Mountain, do not provide the solution, despite heavy propaganda in Italy to the contrary.

Most importantly, activists hope to prevent the threatened reopening of Italy's four nuclear reactors, closed after a referendum in 1987.

When Scanzano was eliminated, the town's besieged mayor urged protesters to pack up and go home. "It's over," he told them, but the people of Basilicata maintained their vigilance at the Terzo Cavone "base

camp" where brigand songs reverberated nightly around a crackling fire.

The camp provided, they said, a good meeting point, as well as a symbol of their distrust of the government that could still break its word in 12 months and choose Scanzano after all but perhaps the elements have now taken care of that plan once and for all.

A rather ironic old sign on the beach, endorsed by the Italian ministry of the environment and the European Union, just 200 meters from the proposed nuclear waste site reads: "Do not soil this zone with waste of any kind. Take it with you."

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WISE Amsterdam/NIRS
ISSN: 1570-4629

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With this last issue of 2003, we wish all our readers a Happy New Year!

The next issue (601) will be mailed out 9 January 2004.

Oops! In our last issue we made a mistake in article 599.5559: "Package deal on gold mine and Cernavoda-2?". On page 7, first paragraph we wrote "a loan for 200 billion Euro". It should be "200 million Euro".

FINANCING NEW NUCLEAR POWER PLANTS

In the past decade, no new nuclear power plants were ordered by western countries and most EU states ruled out new nuclear with legislation but yet the nuclear industry continued to beat its drums proclaiming a revival. Has the time come for industry and governments alike to accept that nuclear cannot be perceived as an attractive investment on liberalized electricity market?

(600.5563) Greenpeace Finland/WISE

Amsterdam – Construction costs for new nuclear power plants continue to escalate dramatically in real terms while reliability continues to disappoint, resulting in fixed costs being spread over much fewer units of output (i.e. kilowatt-hours) than expected.

Nuclear power plants are expected to be expensive to build but cheap to run: high fixed costs, but low variable costs. If construction costs are low and reliability high so that fixed costs remain low and can be spread over a large number of kilowatt hours of output, the plant is considered economically viable

Amongst variable costs, fuel costs are low, but non-fuel costs for operation and maintenance are always higher than anticipated. The operating costs of many nuclear power plants are often so high that it would be cheaper to close the plant and build a new fossil-fired station. (1)

The impact of competition on power generation

The introduction of competition has had two important impacts on nuclear economics. The first being that consumers are no longer captive to a franchise supplier therefore it can no longer be assumed that build and operational costs incurred can be passed on to consumers. These additional costs now tend to fall on shareholders as lost profits instead of consumers as in a monopoly markets; making new build of any type a huge investment risk in a liberalized electricity market.

To reflect this risk, the required rate of return on capital is much higher and the period over which construction costs are recovered is much shorter in a competitive market. The shorter accounting life is based on how long it

can reasonably be assumed that operating the plant will be profitable, not on the engineering life of its components.

The second factor is that existing nuclear power plants often cannot make the rate of return expected when built because the wholesale price of electricity is forced down by competition. Assets that cannot achieve the expected rate of return are characterized as 'stranded'. Owners of 'stranded' plants argue that the plants were built in good faith and were approved by regulators therefore they should be entitled to the income expected when the plant was built. If the market will not provide it, it should be raised with a surcharge on consumers. The taxpayers forced to pay for these poor investments are then surcharged as customers so that plant owners can retain expected profits. (2)

The [DOE] report states unambiguously that the so-called third generation nuclear power plants are not able to compete in the deregulated market.

Prospects for new nuclear plants in western countries

The nuclear industry continuously claims that the prospects for new nuclear orders have improved and that new reactor designs will solve problems of inadequate safety and poor economics. That there is now one western country, Finland, about to order a new reactor, has fuelled the bluster.

In reality the only orders, apart from Finland, have been placed by Pacific Rim countries, mainly China, Korea and Taiwan, where utilities remain

protected from the consequences of poor investment decisions by monopoly privileges. Even in these markets, ordering rates are much slower than projected.

The United States

In 2000, the U.S. Department of Energy (DOE) published a study commissioned by Westinghouse, which illustrates the lack of competitiveness of reactors in the U.S. The report states unambiguously that the so-called third generation nuclear power plants are not able to compete in the deregulated market. "Therefore if nuclear power is to be commercially attractive in the U.S. in the next 5-7 years, a dramatic decrease in the capital cost of a Generation III plant is necessary." (3)

There have been no new completed orders for nuclear power plants since 1973 yet comprehensive energy legislation currently debated in the U.S. Senate attempts to promote building of new nuclear reactors with heavy subsidies. (See also *WISE/NIRS Nuclear Monitor* 599.5557: "Energy Bill stalls in U.S. Senate") In practice this equates to a 10-year infusion of billions of dollars in research and development and tax breaks.

Despite the will at government level, Wall Street analysts and investment bankers are reportedly unconvinced. Edward Tirello, managing director and senior power analyst at Berenson & Co., told participants at the American Nuclear Society's winter meeting that Wall Street no longer considered nuclear a good investment. He said that Wall Street was wary of investing because of real and/or perceived risks associated with nuclear.

Tirello then went on to say that the task of re-educating financial communities would be "the biggest job of your life" and that if unsuccessful,

the industry "is finished" (not all bad news then...). Financing is made more difficult by hedge funds that have been investing in utilities since the 1970s. Hedge funds make money by betting that stock prices drop – bad news for the industry is great news for the funds.

Entergy Corp. president, Donald Hunt commented that some nuclear companies were already involved in 're-educating' the financial community but admitted that the key to new build is whether the Energy Bill passes. He said that financial incentives would be required and suggested that this could range from emission or tax credits to those already proposed in the Energy Bill. (4)

United Kingdom

British government reviews on the economics and policies related to nuclear power in 1990 (privatization of electricity industry), 1995 (privatization of nuclear industry) and 2002 have yielded similar conclusions; the strategic case for new nuclear is weak and the economics of the business poor.

British Energy's severe economic crisis led to the company applying for government assistance. The European Commission is currently considering whether to accept the U.K. governments rescue packet (Euro 4.7 billion, US\$ 7.9 billion). This and the experience of Sizewell B are believed to have helped the government to

SAFETY CONCERNS AT OLKILUOTO

Recent lapses in safety culture at Olkiluoto has led to Finnish regulators (STUK) insisting on special inspections in early 2004 to investigate and owner TVO being ordered to develop plans to improve safety. Between August and October, seven reported accidents at the plant were rated Level 1 on the International Nuclear Event Scale (INES), a tool used to communicate to the public the safety significance of reported events at nuclear installations.

Nucleonics Week, 4 December 2003

reach the decision to rule out new nuclear power plants from the White Paper. (See also *WISE/NIRS Nuclear Monitor* 584: In Brief) At Sizewell B, completed in 1995, the actual price for the electricity produced was eventually three times the price originally planned. (5)

Advanced reactors

The nuclear industry is hoping that new reactor designs will solve the problem of poor economics. However, with the exception of General Electric's (GE) ABWR model, these so-called advanced reactors exist only on paper, their supposed advantages yet to be proven.

Experience gained from two ABWRs built in Japan offers the industry no encouragement. In March 1995, GE estimated that a 1,300 MW ABWR could be constructed for US\$ 1,528 (in 1997) per kilowatt of electrical capacity. The actual construction costs of the reactors built in Japan, completed in 1996 and 1997, was reportedly double GE's estimation in 1995. (6) (7)

Finnish belief in cheap nuclear

Nuclear is an extremely political issue and the Finnish nuclear lobby's wish to have the 'first new reactor' is so strong that cost has not been a crucial factor. There is strong belief that nuclear is a cheap and reliable energy source, partly due to the operating history of existing plants and lack of serious accidents or scandals (see box).

Teollisuuden Voima (TVO) has signed a contract with AREVA (shares ownership of Framatome ANP with Siemens) and Siemens to build the EPR, an advanced model that exists only on paper, at Olkiluoto. Framatome ANP will supply the nuclear island while Siemens supplies the conventional island (turbine). (8)

Official cost estimates for the EPR have already risen by roughly 30 % above the highest original projections of Euro 1.75-2.5 billion (US\$ 2-2.9 billion).

TVO shareholders vary from electricity-intensive industry to small municipalities. Investors will get

electricity generated by the EPR at cost price, either to use or sell on. TVO is a co-operative that produces power for its shareholders thereby enjoying the luxury of its own ready-made market. (9)

Many TVO shareholders appear unable, or unwilling, to make critical analysis of the economics and risks connected to the project. One example was the decision-making procedure of one of the biggest shareholders, the city of Helsinki. City council members were not provided with the economical calculations on which the estimated profitability was based and although it was possible for to seek this information from the city controller's office, only one council member took the opportunity.

Helsinki City Council is thought to be investing Euro 310.4 million (US\$ 360 million), which equates to a 9.7% share. Fortum, a TVO shareholder, is to take a 25.1% share, subject to Board approval, and is said to have issued new bonds to help refinance its debts. Fortum has put its oil business up for sale and is listing on the Finnish stock exchange to raise funds to develop its aspirations in the power trade. Stora Enso, which owns 14% of Pohjolan Voima Oy, TVO's largest shareholder is also expected to invest in the project.(10)

Special price for the Finns?

Framatome ANP is eager to get a prototype of EPR up and running in order to gain experience of the reactor and credibility for marketing to potential customers. To that end, it is supposed that TVO is getting the reactor for a 'special price', which suggests that EPR is not as competitive in the market place as perceived.

Public subsidies

Prior to the political decision on the reactor in Finland, one of the main pro nuclear arguments was that no public subsidies would be required. In reality, Siemens had applied for Hermes export credits for their turbine from the German government, improving TVO's chances of achieving a cheaper loan. Export credit guarantees are usually awarded to projects implemented in developing

countries to decrease the investment risk of the supplier. The final decision about the Hermes credits was to be made after TVO signed the construction contract however, Siemens has subsequently withdrawn the application (see box).

It had been rumored that France was also likely to subsidize the project given its governments eagerness for the development EPR. French Industry Minister, Nicole Fontaine, has recommended EPR as replacement for existing reactors to be retired by 2020. (11)

Future costs

Finnish legislation states that nuclear companies are responsible for the decommissioning of the power plants and the management of the nuclear waste. Finnish operators have reserved approximately Euro 1 billion (US\$ 1.2 billion) into a special fund for these purposes. Compared with estimates in other countries based on previous experience of decommissioning, it appears that the Finns have grossly underestimated. (12)

The nuclear industry is surviving on a small number of new orders. In most countries with liberalized electricity markets experience indicates that nuclear power plants cannot compete without public subsidies. The fact that a Finnish company is now placing an

order has raised hopes among nuclear manufacturers. The Finnish 'experiment' will definitely be monitored closely by both the nuclear opponents and proponents.

Sources:

- (1) *The economics of new nuclear power plants and electricity liberalization: Lessons for Finland from British experience*, Thomas S., 2002
- (2) See (1)
- (3) *Study of Cost Effective Large Advanced Pressurized Water Reactor that Employs Passive Safety Features*, U.S. Department of Energy, J.W. Winters, 2000
- (4) *Nucleonics Week*, 20 November 2003
- (5) See (1)
- (6) GE Nuclear Energy, Presentation to the International Conference on Nuclear Power Industry Development and Cooperation, 16-17 March 1995. Price recalculated from 1992 dollars using GDP deflator.
- (7) *Nucleonics Week*, 25 January 1996
- (8) AREVA press release 18 December 2003
- (9) *Nucleonics Week Special*, 16 October 2003
- (10) See (4)
- (11) See (9)
- (12) VTT, Rasilainen K, Vuori S. Käytetyn ydinpolttoaineen huolto, suomalaisen suunnitelman pääpiirteet. VTT Energia, 1999
- (13) Friends of the Earth Europe press release, 16 December 2003
- (14) Williams, W.A., and Lee, P.S. *Advanced LWR Technology for Commercial Application*.

SIEMENS EXPORT CREDIT

Opposition from Greens in the German government to plans by Siemens AG to export equipment to China and Finland despite Germany's nuclear phase-out policy has led to Siemens withdrawing its bid for a Hermes export credit guarantee from the government for the TVO project. Hermes credits relate to the supply of key equipment, including turbine generator, and guarantees a lower interest rate. Siemens are now under pressure to find alternatives without increasing costs.

***Nucleonics Week*, 11 December 2003; AREVA press release 18 December 2003**

- (15) *WISE News Communiqué* 485.4813: "Problems of decommissioning nuclear reactors"
- (16) *The Canadian Nuclear Lesson*, Sierra Club of Canada and Greenpeace International Joint Briefing Paper, 2001

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URANIUM MINING IN 2003

In time-honored tradition, the *WISE/NIRS Nuclear Monitor* is pleased to present the annual summary of occurrences in the world of uranium mining for the year 2003.

(600.5564) WISE Uranium – During 2003, the uranium spot market price increased by 35%, from US\$ 10.20 to US\$ 13.75 per lb. U₃O₈ (as of 8 Dec., 2003). While this increase gave rise to a few announcements for the restart of idle uranium mines, it was - also given the continuing imponderabilities of the uranium market - not strong enough to trigger a new uranium frenzy.

On the contrary, the uranium extraction industry experienced a number of major blows - operational, such as the flooding of the McArthur

River high-grade mine in Canada, and political, like the halt to the further development, and the subsequent backfilling, of the Jabiluka mine in Australia at the request of the Traditional Owners. Several announcements to increase uranium production capacity came from central Asia, where the legacy of Cold-War era uranium mining has not all been dealt with yet.

New uranium mining projects

In Canada, administrative preparations for the development of the Cigar Lake high-grade mine in Saskatchewan continued with CNSC's approval of

Cigar Lake waste rock disposal in the mined-out Sue C pit at McClean Lake.

The licensing procedure for Powers Resources' proposed Gas Hills uranium in-situ leach (ISL) project in Wyoming, U.S., continued and in view of the rising uranium price, URI revived plans to commence production at its Vasquez uranium ISL project in Texas.

The increased price of uranium has caused Ukraine, which currently produces 34.5% of its uranium requirements, to consider exporting

uranium. This would require the development of new capacities; however, given that Ukraine has not allocated sufficient funds for the reclamation of its existing uranium mill tailings (see below), the waste management problem would only be aggravated.

In Kazakhstan, construction of the Zarechnoye uranium ISL mine is scheduled to begin in 2004.

Iran is developing its first uranium mine at Saghand - a small-scale low-grade deposit.

In India, opposition grew against two uranium mine projects, Domiasiat in Meghalaya and Lambapur-Peddagattu in Andhra Pradesh. Both projects are aiming at low-grade deposits located in areas inhabited by tribal people and although mining company UCIL promised, in August, that mining at Domiasiat would not start without local consent, it was announced on 10 December that the project would commence. A guerrilla group that destroyed drilling equipment at the proposed site on December 3 has joined the opposition against the Lambapur-Peddagattu project (see box). India is also testing a new method of extracting uranium from seawater.

INDIAN RESISTANCE

On 3 December, the outlawed People's War set ablaze two drilling machines, two generators, two trucks and a jeep belonging to an exploration unit of the Department of Atomic Energy. The attack was in protest against the plans for a uranium mine in Pedda Adisarlapally mandal of Nalgonda district (see *WISE/NIRS Nuclear Monitor* 594.5553: "India to start up new uranium mines"). Some 15 members of the guerilla group descended on the site and ordered research work to be stopped. They set vehicles ablaze, brought the employees to a nearby village and organized a "public meeting" urging the people to resist against the planned mine.

The Hindu, 5 December 2003

After decades of controversy in Australia, Rio Tinto bowed to the opposition from the Traditional Owners to the Jabiluka uranium mine project and backfilled the material already mined. Several major mining companies have now vowed not to mine at World Heritage sites. Financing for the Honeymoon uranium ISL mine project in South Australia remains unclear and following the end of a trial operation, the mine lies idle.

Issues at operating uranium mines

McArthur River, Cameco's high-grade mine in Canada had to be temporarily shut down after water inflow. It was later discovered that McArthur River miners had been exposed to higher than usual radon levels during the mine flooding.

Following the Federal Courts decision to quash the McClean Lake mine's operating license in 2002, Cogema, along with the Province of Saskatchewan and the Lac La Ronge Indian Band, among others raised an appeal. The Appeals Court will hear the case in 2004. Meanwhile, the Saskatchewan Eco-Network named the Inter-Church Uranium Committee (ICUC) and its lawyer Stefania Fortugno, who had won the court case, "Environmental Activists of the Year". In parallel with the appeal, Cogema is pursuing a new operating license for McClean Lake, in case the appeal is lost. In addition, the licensing procedure for the Sue E extension of the McClean Lake mine is ongoing.

In the U.S., IUC's White Mesa Mill in Utah, unlike previous years, made few headlines. No new proposals to process all kinds of, "alternate feed material" (rather than uranium ore) were publicized - the company appears to be too busy with its exploration projects in Saskatchewan and Mongolia. At White Mesa, an incident occurred in July when the solution freeboard limit in tailings disposal cell #3 was exceeded, potentially affecting dam stability.

The only other active uranium mill in the country, Cotter Corp.'s Cañon City

mill in Colorado, easily compensated for the lack of headlines from Utah. On January 2, the state lifted the mill's suspension on accepting radioactive waste as cover material for its tailings. By the following day, the U.S. EPA contradicted the state, finding radioactive waste shipments to the Cañon City mill unacceptable. In May, the Colorado State parliament approved a bill imposing additional requirements on Cotter Corp.'s Cañon City uranium mill, particularly targeting new waste shipments to the site. In July, the state cited Cotter for more violations at the mill and by September, it had become known that contaminated water was seeping around a plugged permeable wall at the mill site.

The only good news this year was that no excess plutonium was found in Cañon City soil samples and in April an Appeals Court overturned a US\$ 41 million jury award won in 2001 by residents allegedly sickened by radiation near the Cotter mill and later sent the residents' case back to district court.

Argentina intends to restart mining at the Sierra Pintada uranium deposit in Mendoza province despite the local Chamber of Commerce joining opposition against the project due to anticipated severe impacts to the regional economy.

In Namibia, Rio Tinto's large-scale low-grade Rössing uranium mine is considering early close down due to "volatile economic conditions", the decision will be announced by year-end.

Uzbekistan is aiming to boost uranium mine output 40% to 3,000 tonnes annually by 2010. While in southern Kazakhstan, a new uranium ISL refinery was completed.

Kyrgyzstan ratified the IAEA's non-proliferation regulations, a prerequisite for the planned restart of the Kara Balta mill, which will process pre-concentrate from the projected Kazakh Zarechnoye ISL uranium mine. Although such processing produces less waste than the milling of raw ore,

it is surprising that a country claiming to be incapable of managing the uranium mill tailings left over from the Soviet era (see below) intends to produce more of such waste.

While other uranium mining operations struggle with the elements and/or public opposition, WMC's Olympic Dam copper/uranium mine in South Australia once again proved to be self-sufficient in this regard. After two major fires at the processing plant in 1999 and 2001, the plant this year was hit by a three-week outage caused by heat exchanger failure.

Abandoned mines

In Canada, negotiations are still ongoing with regard to who will pay for the cleanup of 42 abandoned uranium mine sites in northern Saskatchewan. The province of Saskatchewan is pressing the federal government to take full financial responsibility for the cleanup while its northern communities demand that cleanup operations begin.

Of the thousands of abandoned uranium mines in the U.S., the exploration pits in the Bighorn Canyon area, neighboring Pryor Mountains (Montana) and the Juniper mine in the Stanislaus National Forest (California) made headlines this year. The National Park Service is planning to cleanup the sites in the Bighorn Canyon area and the Forest Service closed a road near the Juniper site for high radiation readings.

In Argentina, reclamation work started at the Malargüe uranium mill tailings in Mendoza province, co-financed by the World Bank.

In Germany, after 13 years of dispute, the Federal Government and the Saxonian State Government signed an agreement on the reclamation of the uranium legacy sites that are not covered by Wismut's current reclamation mission. The agreement covers the sites that were no longer owned by Wismut post 1962, mainly located in the Ore Mountains near the Czech border. The total amount of Euro 78 million (US\$ 84 million) is made available for the legacy sites

until 2012 – however, that is only 17% of the sum required, according to earlier estimates.

Kyrgyzstan still seeks foreign support for the urgent stabilization of the abandoned uranium mill tailings deposits located in the south of the country. Offers of assistance have already come from Tajikistan, Uzbekistan, Russia, the U.S., and France. The reclamation will start in 2004, financed with US\$ 5 million supplied by the World Bank. An EU-sponsored study found that the main problem was the mechanical stability of the tailings dumps threatened by landslides and seismic activity; there is no widespread radiation hazard in the region at present.

Shutdown and decommissioning of uranium mines

The Canadian Nuclear Safety Commission (CNSC) approved Cameco's proposal to flood the mined-out Rabbit Lake open-pit mine in northern Saskatchewan by opening the dam separating it from Wollaston Lake. The approval came in spite of Inter Church Uranium Committee's (ICUC) fears that radioactive particles will move into the lake in the long term.

In the U.S., decisions were made on the groundwater remediation strategy at three uranium mill tailings sites, Naturita, Slick Rock, and New Rifle (all Colorado), covered by the Department of Energy's (DOE) UMTRA program. In all three cases, the strategy involves no further groundwater treatment, but complete reliance on natural flushing and/or relaxed contaminant concentration standards. The same is envisaged for a portion of the Monticello tailings site in Utah.

For the reclamation of the former Atlas Moab tailings site (Utah), now under jurisdiction of DOE, the search for alternative disposal sites continued. The option to relocate the tailings to the White Mesa mill found opposition from the Ute tribes. No decision on relocation options or on-site disposal has been made yet. For the U.S. sites whose decommissioning falls under the responsibility

of their previous operators, the following actions were requested and/or approved: demolition of Rio Algom's Ambrosia Lake mill, 9-year extension of reclamation milestones for Homestake's Grants tailings site (New Mexico), reclamation of Plateau Resources' Shootaring Canyon mill site (Utah), relaxed requirements and 2-year delay for Pathfinder's Shirley Basin and LuckyMc mill sites, and termination of the Green Mountain Ion-Exchange Site license (Wyoming).

On several occasions, measures meant to protect the integrity of the tailings for 1000 years failed after a short time. During two separate site visits, United Nuclear's inspector had to chase cattle from the Church Rock (New Mexico) tailings because of damaged fence lines. At the Bear Creek tailings (Wyoming), the state-imposed, so-called institutional controls failed miserably even before they needed to be relied upon. The Nuclear Regulatory Commission's (NRC) "staff was particularly surprised to learn several months ago that the mineral estate at Bear Creek has already been leased. This discovery does not give the staff confidence that institutional controls such as, for example, restrictive covenants, will be sufficient to provide long-term protection of the disposal site, especially as memories fade in the future."

Western Nuclear continued its efforts to convince NRC that prohibition of the use of contaminated groundwater in the surroundings of its Split Rock tailings site (Wyoming) is a viable long-term management option, rather than tedious and expensive groundwater cleanup to prevent contaminant plume dispersion. The company filed new groundwater modeling results showing a reduced area of impact compared to earlier modeling.

At Dawn Mining's Midnite mine site (Oregon), cleanup of spilled roadside ore is planned for spring 2004, but the company maintains it has no funds for cleanup of the Midnite mine site itself.

The Texas Commission on Environmental Quality issued an Agreed Order imposing a US\$ 41,500 penalty on vari-

ous violations to Everest Exploration's Hobson ISL site (Texas), currently undergoing decommissioning.

The Czech government announced the final shut down of the Rozná uranium mine by 2005. The closure of the country's last uranium mine has already been deferred several times. So far, the cleanup of the Czech uranium mines has cost the government CZK 21 billion (US\$ 778 million) since 1989, and a total cost of CZK 80 billion (US\$ 3 billion) is expected by 2040. The specific cleanup cost would therefore reach US\$ 10.8 per lb. U_3O_8 produced, comparable to the uranium spot market price at the beginning of the year. This specific cost figure does not differ much from those incurred for the cleanup of the U.S. UMTRA Title I uranium mill tailings sites (US\$ 14.70 per lb. U_3O_8) and the German Wismut sites (US\$ 13.91 per lb. U_3O_8).

In Spain, former uranium mill workers of the now dismantled Andújar uranium mill filed a complaint for compensation for health damages. The workers are now demanding indemnification under civil law, following earlier unsuccessful attempts to initiate prosecution under criminal law.

In Portugal, environmentalists called

for the overdue start of cleanup at the Urgeiriça uranium mine site, which may be postponed due to for lack of funds. An epidemiological study among residents of the site was initiated.

Stabilization of the Dniprodzerzhynsk uranium mill tailings in Ukraine was struck by insufficient allocation of funds, although a revised reclamation plan has been elaborated cutting costs to a small fraction of the sum foreseen initially.

In Kazakhstan, where some 100 million tonnes of tailings have been dumped since 1965, the dusting problem at the Aktau uranium mill tailings remained serious. The fine dust from the bare spots of the tailings continues to be blown towards the town of Aktau. With the mining company proving incapable of managing this problem (although it can easily be resolved in the short term), serious concerns arise regarding the necessary long-term stabilization of the tailings.

Regulatory and policy issues

In the U.S., the Nuclear Regulatory Commission (NRC) issued a draft policy statement on Environmental Justice, weakening the constraints on siting of hazardous industries. A U.S. Appeals Court upheld the Environmental Protection Agency's

(EPA) rule setting limits on the permissible level of radionuclides in drinking water despite claims from the nuclear industry that they could impose unwarranted restrictions on nuclear facilities.

The state of Wyoming relaxed the groundwater standards for uranium in-situ leach (ISL) mines: the requirement to restore groundwater to pre-mining conditions after uranium ISL mining was dropped, easing the burden of costly groundwater restoration.

The Australian Senate conducted an inquiry highlighting serious flaws in uranium industry regulations. South Australia began a review of the environmental impacts of the acid ISL mining process, as being used in the Beverley mine and Honeymoon trial operation.

The World Health Organization (WHO) revised its provisional guideline value for uranium in drinking water from 2 $\mu\text{g/l}$ to 9 $\mu\text{g/l}$. The change is not based on new toxicity data, but on a revision of the allocation of the tolerable daily intake to drinking water from 10% to 50%.

Source and contact: WISE Uranium

IN BRIEF

Areva buys Urenco centrifuge enrichment technology.

On 24 November, France's Areva bought a 50% share in the Enrichment Technology Company (ETC) of Urenco and will, with this deal, get access to Urenco's centrifuge technology. Urenco's ETC is responsible for centrifuge development and manufacturing. Areva wants to use the centrifuge technology for its planned Georges Besse II enrichment plant at Tricastin, which is expected to start operation in 2007. A new centrifuge plant consumes less electricity than its current gas diffusion plant at Tricastin. Total investment costs for the new plant will be 3 billion Euro (US\$ 3.7 billion), presumably including the costs of the

50% stake in ETC. The deal is still to be agreed by the governments of France, Germany, Netherlands and the U.K.

Urenco and Areva press releases, 26 November 2003

U.K. radwaste commission: transmutation "no magic answer". The U.K.'s Radioactive Waste Management Advisory Committee (Rwmac) published a report on 3 December in which it concluded that the technique of transmutation provides little prospects. "Partitioning and transmutation" is often mentioned as the future solution for the waste problem, though it is known that the technique is complex, expensive and sometimes

impossible (see *WISE News Communique* 503.4965: "Partitioning and transmutation: a hype"). Rwmac chairman Curtis said, "we would be fooling ourselves if we think that the nuclear industry can simply conjure its long-term waste management problems away through this means". According to Curtis, it would cost "very large amounts of money over long time periods" and a further commitment to nuclear energy and reprocessing of spent fuel to make the technique feasible. Transmutation would need new nuclear reactors or particle accelerator systems and partitioning a new reprocessing plant, separating spent fuel in more fractions than is currently done. Besides, it

could only deal with a small portion of the current high level waste in the U.K.
Rwmac press release, 3 December 2003;
Nucleonics Week, 4 December 2003

France: study on wind power vs. nuclear. Greenpeace France has published a study comparing the costs of wind power to nuclear energy. The study "Wind Vs Nuclear 2003" demonstrates that for the same investment, wind generates 5 times more jobs and 2.3 times more electricity than a nuclear reactor. A new reactor costs 3-3.5 billion Euro (US\$ 3.7-4.3 billion) and results in a 1600 MW unit and 10 Tera Watt-hours/year of electricity. The same amount of money invested in wind energy would result in 7,616 MW of capacity and an annual 24 Tera Watt-hours of electricity. On the publishing day, Greenpeace activists displayed 10 wind turbines on the grounds of the Penly NPP demanding that electricity company EdF invest massively in wind power, rather than in the proposed European Pressurized water Reactor (EPR). The full version of the study (in French) is available on www.greenpeace.fr and an English summary on www.greepeace.org.
Press release Greenpeace International, 4 December 2003

ITER: Cadarache European candidate Canada withdraws. The site selection discussions on the planned International Thermonuclear Experimental Reactor (ITER) resulted in the decision by the European Union on 26 November to propose the French Cadarache research center as the European candidate. Spanish candidate, Vandellós was dropped as a result. ITER construction will cost around 4.6 billion Euro (US\$ 5.7 billion) and billions more to run. Were Cadarache chosen by the international partners, Europe promised to contribute 4.6 billion Euro for construction and operation. On 5 December, Canada withdrew itself as candidate for the ITER site due to a lack of federal support. Canada had promised US\$ 2.3 billion (1.3 billion Euro) to site the reactor, far less than the European

Union or Japan, presently the only other candidate site. Negotiations will continue on 20 December in Washington D.C., U.S.
Greenpeace International press release, 26 November 2003; AFP, 26 November 2003; Toronto Star, 8 December 2003

Sellafield pipeline adrift in Irish Sea. Sections of pipeline, forming BNFL's Temporary Sealine, broke clear of retaining steel cages during rough seas and more than 150 sections of plastic pipeline were found on beaches in Northern Ireland, the Isle of Man and the Cumbrian coast. BNFL described the pipeline as "lightly radioactively contaminated" and as posing no risk to the public. The pipeline was said to be used to discharge surface water from the Sellafield site into the Irish Sea. At present, Sellafield discharges liquid waste into the Irish Sea on a daily basis using 2 kilometers of pipeline.
Core Briefing, 26 November 2003; BBC, 14 December 2003

Ireland seeks assurances over Sellafield – again... Irish Environment Minister, Martin Cullen, has again raised concerns regarding Sellafield with his British counterpart, Margaret Beckett during meetings in London on 1 December. On the agenda this time was the structural safety of Sellafield's aging buildings – specifically the stability of the roof of the building used to store waste product, medium active concentrate (MAC). He said that "... Ireland has and will continue by word and deed to take all necessary steps to ensure that Sellafield ceases to pose a threat to Ireland's environment and it's people." We wish them good luck.
AFP, 4 December 2003

Sellafield source of plutonium contamination in children's teeth. Traces of plutonium found in extracted teeth of some 3000 children can be linked to Sellafield according to Britain's Public Health Minister, Melanie Johnson. A study commissioned by the Department of Health in

1997 discovered that levels of plutonium found were twice as high in teeth taken from children living close to Sellafield than those living 140 miles from the plant. Six years on, the results have finally been validated by the DoH, fuelling Ireland's continued calls for the closure of the plant. Johnson has attempted to diffuse the row by claiming that the traces found were too minute to be a public health risk however this has been disputed by scientists, MPs and environmental campaigners calling for an immediate inquiry. One of the UK's leading experts on blood disorders, Professor Eric Wright of Dundee University Medical School, said that even tiny specks of plutonium contamination could lead to cancer.
The Irish Examiner, 2 December 2003; CORE Briefing, 10 December 2003; the Observer 1 December 2003

Oz nuclear dump election issue. The Federal Court rejected the South Australian Government's bid to stop a low-level waste dump being built near Woomera. SA Environment Minister, John Hill said that there were grounds for appeal and suggested that the dump would become an election issue. Federal Government Finance Minister said that any legal challenge will be a waste of time and money and suggested that the State Government "take a sensible and cooperative approach to the establishment of this important national facility".
The Age, 8 December 2003; The Australian, 9 December 2003

Japan: no new power plant for Suzu City. The 28-year-old plan to build a nuclear power plant in Suzu City, Ishikawa prefecture has finally been 'frozen' (scrapped). The three utilities involved, Kansai Electric Power Co, Chubu Electric Power Co and Hokuriku Electric Power Co, said cited deteriorating electricity demand due to the regions' sluggish economy.
Reuters, 5 December 2003

Siemens to export Hanau plant to China. Chancellor Schroeder

announced, during a recent trip to China, a deal worth an estimated 50 million Euro (US\$ 85 million) that would allow Siemens to export MOX fuel fabrication equipment to China. Given Germany's commitment to nuclear phase-out, the deal has caused huge controversy and coupled with Siemens' application, now withdrawn, for export credits related to the Finnish EPR project, an alleged rift opened within the Red-Green coalition government. Denying rumors of a split, the SPD-Green government agreed to approve the export only if China formally agrees to allow IAEA supervision of the plant, in addition, stringent regulations would be put in place to ensure the plant was not used for military purposes. It has subsequently been suggested that Germany may have to assume the costs of any special IAEA inspections as on similar occasions when China had

imported nuclear technology, IAEA inspections were only possible when the exporting nation paid. The European Commission will investigate whether the deal violates EU export rules. EU Commissioner, Michael Schreyer warned "we should be very careful to prevent the creation of tomorrow's security problems by today's export of nuclear technology".
AFP, 7 December 2003; Deutsche Welle, 8 & 11 December; Nucleonics Week, 11 December; Hamburg Bild am Sonntag, 14 December 2003; Hamburg Financial Times, 15 December 2003

License application submitted for New Mexico. A license application for the construction and operation of the National Enrichment Facility has been submitted by Louisiana Energy Services to the Nuclear Regulatory Commission (NRC). The gas centrifuge

uranium enrichment plant is to be constructed in Lea County, New Mexico. It is expected to take 18-20 months for the application to be reviewed (see *WISE/NIRS Nuclear Monitor* 591.5534; "LES switching to New Mexico?").
WNA News Briefing 10-16 December 2003

Canada: Bruce A-3 reaches criticality. Following its restart on 6 December, Bruce Power reported that the 904 MW nuclear power reactor reached criticality. The reactor must now complete a series of on-power tests of its operating and safety systems before it can be reconnected to Ontario's power grid. Bruce A-4 restarted in October. Both reactors had been shut down for several years due to safety problems (see *WISE/NIRS Nuclear Monitor* 588.5522; "Canada: restarting its troubled reactors").
Nucleonics Week, 11 December 2003

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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.

The *WISE/NIRS Nuclear Monitor* publishes international information in English 20 times a year. A Spanish translation of this newsletter is available on the WISE Amsterdam website (www.antenna.nl/wise/esp). A Russian version is published by WISE Russia and a Ukrainian version is published by WISE Ukraine. The *WISE/NIRS Nuclear Monitor* can be obtained both on paper and in an email version (pdf format). Old issues are available through the WISE Amsterdam homepage: www.antenna.nl/wise.

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