

NUCLEAR MONITOR

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YUCCA MOUNTAIN SHOWDOWN

The United States Senate is preparing to hold a landmark vote on whether Yucca Mountain, Nevada will become the nation's first high-level radioactive waste dump. Timing of the vote is not certain, but as this *Nuclear Monitor* goes to press, it appears likely shortly after the Senate's Fourth of July holiday recess.

(570.5415) NIRS - If the Senate does not vote on the issue by 25 July, Nevada Governor Kenny Guinn's (R) veto of the project will be upheld, and the project will be cancelled permanently.

Both opponents and supporters of Yucca Mountain have been engaged in intensive campaigns to galvanize their base of support and win over "swing" voters.

And although it remains an uphill battle for Yucca opponents, momentum appears to be moving slightly their way at this writing, as a number of recent events have raised new questions about the viability of the Yucca project.

* On 14 June, a 4.3 magnitude earthquake shook Yucca Mountain (and Yucca supporters) and served as a reminder that the site is in one of

the mostly seismically-active areas of the United States. That same day, Nuclear Regulatory Commission Chairman Richard Meserve said that high-level waste can be stored adequately on-site for decades if Yucca Mountain is not approved by Congress—undercutting arguments by Yucca supporters that the dump is necessary to avoid imminent problems.

In a rare moment of candor, Meserve admitted that the Yucca issue is not necessarily about safe radioactive waste storage, but about utility economics and politics. "From the public perception and political view, Yucca Mountain has become a litmus test for nuclear power," he said. "And it has been an issue that millions of dollars have been spent to develop the site, and the country's willingness to spend billions of dollars more to develop another site

is questionable." Meserve added that expansion of onsite storage would not be welcomed by nuclear utilities—which would have to pay for that expansion. At Yucca Mountain, the Nuclear Waste Fund would pay for all waste transportation and storage, with taxpayers making up the substantial difference.

* Also in mid-June, the Environmental Working Group unveiled a highly-publicized new website (www.mapscience.org) that allows users to find out how close they live to a likely radioactive waste transport route, as well as how many schools, hospitals and other institutions lie near the routes. The site also addresses a continuing lie about Yucca Mountain—that it would make a substantial difference to the nation's radioactive waste storage problem. Indeed, the website shows clearly that huge amounts of high-level waste would remain at reactor sites across the country even when Yucca has stopped accepting new waste.

* Meanwhile, numerous musical acts, including Bonnie Raitt, Midnight Oil, The B-52s, Crosby, Stills, Nash & Young and the Indigo Girls have been touring the country raising awareness about the Yucca issue and encouraging their audiences to oppose the Yucca project. Actor Mike Farrell came to Washington in June, bringing with him a letter signed by some 70 Hollywood celebrities, opposing the project.

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* On 17 June, the U.S. Conference of Mayors approved a resolution raising serious concerns about the Department of Energy's planning for transportation of high-level waste.

* A six-cask radioactive roads and rails tour, sponsored by NIRS, converged on Washington for a rally on 18 June that coincided with a national call-in to Senators day. The mock waste casks toured the Northeast, Southeast, Midwest and Northwest, and most are continuing touring through June. Citizens Awareness Network, Citizens Action Coalition of Indiana, Citizen Alert and Blue Ridge Environmental Defense League activists have been driving the casks across the country, meeting with activists, the public and the media, and drawing new attention to the issue of unnecessary and dangerous radioactive waste transportation. The 18 June rally brought together leaders of 10 national environmental groups along with both Nevada senators.

* The next day, 19 June, Senate Yucca supporters—who still confidently predict victory—tried unsuccessfully to rush a floor vote on the issue, prompting a strong rebuke from Senate Majority Leader Tom Daschle.

Said Daschle, "Senate Republicans have demonstrated how misguided their priorities are by making another attempt to ram through a bill

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The **next issue** of the *WISE/NIRS Nuclear Monitor* (571) will be mailed out on 19 July 2002.

WHAT U.S. READERS CAN DO

The upcoming vote on Yucca Mountain appears closer than ever. Your actions now can make the difference! Your efforts so far are working! Because Senators are hearing from their constituents, more and more are looking more closely at this issue. We need to keep up and expand our efforts.

Try to make appointments to meet with your Senators when they return home for the July 4th recess, and to attend public events they participate in. Senators who have pledged to vote against Yucca should be publicly praised; those who have pledged to vote for the dump should hear from constituents. We have plenty more postcards for your Senators; please let us know if you want some—we encourage you to pass them out to your friends and colleagues, and then return them to NIRS so we can hand-deliver them.

Take advantage of free media! This issue is ripe for radio talk shows; even if the host is not with you, the audience likely will be. Please respond to pro-Yucca editorials in your newspapers, and keep writing letters to the editor even when there are no editorials.

Capitol Switchboard: 202-224-3121. Make sure all of your family, friends and colleagues have called your Senators to express their opposition to Yucca Mountain.

As always, call upon NIRS for any help we can provide.

catering to power companies - and to do so while the Senate is considering the Department of Defense authorization bill.

"Passing the defense bill and providing for the well-being of our armed services in the middle of a war is a greater priority than protecting the special interests of the nuclear industry. Americans want Congress to address real domestic problems such as the need for affordable prescription drugs and quality schools, not waste time and money appeasing the nuclear power industry.

"This bill will not solve anything. It will only create 100,000 new problems in nearly every state in the form of radioactive shipments on highways and railways, creating a multitude of terrorist targets. And it will create a multi-billion-dollar boondoggle on an earthquake fault in Nevada."

The key vote on Yucca Mountain is likely to come not on the up-or-down vote on the project itself, but on a

procedural issue: whether any Senator can, or should, bring up this resolution for a floor vote over the opposition of the Senate Majority Leader, who normally is the only Senator who can bring a measure for a vote. Special provisions were inserted into the Nuclear Waste Policy Act to allow such a technique, but Senate precedent argues strongly against allowing an individual Senator to essentially overrule the Majority Leader. Daschle has made clear that he has no intention of bringing the issue to the floor.

Thus, the nuclear industry must rely on its hardcore supporters to force the issue, and perhaps create a new Senate precedent that could backfire upon them at a later date.

Source and contact: Michael Mariotte at NIRS

PLUTONIUM HITS THE ROAD DESPITE “DIRTY BOMB” SCARE

Despite the arrest and detention of Abdullah al-Muhajir for plotting to build a “dirty bomb”, highly controversial transports of plutonium are going ahead, both within the US and internationally from Japan to the UK.

(570.5416) WISE Amsterdam - The revelation that US citizen Abdullah al-Muhajir had been arrested on 8 May, accused of conspiracy to build and detonate a “dirty bomb” designed to spread radioactive contamination caused a media frenzy.

While it wasn't clear how close al-Muhajir got with his plans, it was soon clear that finding radioactive material would not be a problem. As Neil Sheehan of the US Nuclear Regulatory Commission (NRC) put it, “The difficulty is that we live in a society where there are 2 million sources out there in active use. Controlling that is a formidable task.”

Inevitably it seems, some of the sources disappear. The NRC reported in May that U.S. companies have lost track of nearly 1,500 radioactive items since 1996, and more than half were never recovered.

In at least two cases, enough radioactive material to contaminate 60 city blocks was abandoned by the owners of bankrupt companies which made gauges to map oil wells.

In one case, the owners were kind enough to ask the Department of Energy (DOE) for help; in the other case, they simply abandoned the radioactive material in a truck and fled to Costa Rica.

The annual budget of the DOE agency set up to deal with abandoned sources has been cut by more than half, from US\$7 million for the fiscal year ended August 2000 to US\$3 million this year. Amazingly, despite the “dirty bomb” plot, the budget is set to be cut still further next year, to US\$2.2 million.

Of course, the biggest sources of

radioactivity by far are in the nuclear industry. How lethal this is can be seen from the industry's own claims that if terrorists tried to steal irradiated nuclear fuel, the radiation would kill them before they could make a “dirty bomb”.

In other words, what the industry calls “clean” nuclear power produces waste that is too “dirty” to be used in a “dirty bomb”!

This nuclear material is particularly vulnerable when it is being transported. Nevertheless, the nuclear industry is going ahead with transports of plutonium which could be used to make a “dirty bomb” or even a nuclear weapon.

Rocky Flats to Savannah River

It must be hard to imagine a less suitable time to transport weapons-grade plutonium across the U.S. from Rocky Flats in Colorado to Savannah River in South Carolina.

South Carolina Governor Jim Hodges threatened to block the shipments by sending out state troopers, but his plan to block the transports was declared unconstitutional by a federal appeals court, and the plutonium transports are ready to roll.

Under an agreement for the U.S. and Russia each to dispose of 34 metric tons of surplus plutonium from nuclear weapons, the plutonium is to be converted into MOX fuel for use in nuclear power stations.

Originally the plan was only to convert part of the U.S. plutonium into MOX fuel and mix the rest with nuclear waste, but the Bush administration decided to convert all the plutonium into MOX fuel, even though a question mark still hangs

over the quality of some of the plutonium.

The plan is then to load the MOX fuel into reactors which were never designed to use it. Loading MOX makes reactors harder to control, and so more likely to have an accident, and irradiated MOX fuel is more radioactive than normal irradiated fuel, so anti-nuclear campaigners vehemently oppose this (see NIRS info sheet “Why Environmentalists Say NIX to MOX Plutonium Fuel”).

Nevertheless, Duke Energy's Catawba and McGuire reactors are proposed for MOX loading in spite of features such as ice-condenser containment systems which the NRC considers 100 times more vulnerable to failure than conventional containment designs. Even Duke Energy itself has raised questions about whether the plan is feasible.

The Russian side of the program has yet more problems. The original plan for a German MOX plant to be dismantled and re-built in Russia to convert the Russian plutonium into MOX fell apart last year (see *WISE News Communique* 553.5311, “Hanau MOX plant to be scrapped, not exported”).

Return of falsified MOX

Meanwhile, another MOX debacle continues with the return of falsified MOX from Japan to Sellafield in the UK. BNFL was caught falsifying quality control data for MOX fuel shipped to Japan in 1999 (see *WISE News Communique* 518.5083, “BNFL fiddling MOX quality control data”). The Japanese utilities insisted it must be returned before they would sign any more MOX contracts.

After initial UK government opposition (see *WISE News*

Communique 529.5164, “BNFL’s response to NII criticisms; UK not willing to take MOX fuel back”) the return shipments finally got the go-ahead.

On 26 April 2002 – the 16th anniversary of the Chernobyl disaster – BNFL’s armed transport ships set sail from the UK, bound for Japan.

They are currently expected to leave Japan with the falsified MOX in early July – possibly on the Fourth of July.

Cumbrians Opposed to a Radioactive Environment (CORE) described the transport as a “shipment of shame” which “will be carried out under the unforgiving glare of the world’s media”.

Sources: *Pittsburgh Tribune-Review*, 23 June 2002; *The Washington Post*, 11 June 2002; *IEEE Spectrum*, November 2001; ENS, 21 June 2002; CORE press release, 26 April 2002

Contacts: For U.S. MOX, contact Mary Olson at NIRS Southeast; for other issues, contact WISE Amsterdam or NIRS’ Washington, D.C. office.

SEVERITY OF SOUTH KOREAN ACCIDENT CONCEALED

An accident at a nuclear power station in South Korea in April, originally described as a “coolant leakage incident”, was in fact a steam generator tube rupture which led to around 45 tons of primary coolant leaking into the secondary circuit. What is more, an official of the Korea Institute of Nuclear Safety has warned that revealing the exact cause of the accident may “harm the reliability of whole nuclear industries”.

(570.5417) Green Korea United - The 12th “Steam Generator Tube Rupture (SGTR)” accident in the world occurred in Ulchin nuclear power plant (unit 4) located in the north-eastern part of South Korea. Due to this rupture accident 45 ton of the primary coolant was poured into the second coolant system.

The accident happened around 18 hours after the shut down for the regular inspection and fuel exchange, and the emergency core cooling system (ECCS) didn’t work, so operators had to manually input the emergency coolant to the reactor.

Even though the accident happened on 5 April, the Korean Hydro & Nuclear Power (KHNP) and the regulator (Ministry of Science & Technology) hid the severity of the accident for the past two months by deliberately describing it as a “coolant leakage incident” in their press release.

Korean nuclear activists didn’t recognize this press release seriously at first due to their distorted information. The Korean Nuclear Safety Committee announced last 25 May that the “incident” is Level 1 on the 7-level International Nuclear Event Scale (INES), insisting that there was no radiation release to the

outside and no one affected by radiation from this event.

Ulchin 4, which started operating in December 1999, was inspected by the licensee, Korea Hydro and Nuclear Power (KHNP), three times before this accident. The inspection methods called Bobbin and MRPC (Motorized Rotating Pancake Coil) revealed slight crack indications, but KHNP ignored the indications, claiming that they were not significant.

According to the final investigation report of Korean Nuclear Safety Committee on this accident (which they describe as an “incident”), the main causes of the accident were several cracks around the Expansion Transition - just above the tube sheet. However, the report deliberately avoids commenting on the problematic material of the tube - the so-called Alloy 600 (HTMA), and even slightly denies the probability that the material may have caused the developing of the cracks.

Nevertheless, according to the Korean Atomic Energy Research Institute, the exact cause of the accident has not been confirmed yet.

There have been 11 SGTR accidents in the world so far, once in Belgium and Japan respectively and 9 times in

the US. All the reactors that have experienced SGTR accidents had steam generators made of Alloy 600 (or Inconel 600), and the material has been considered as a main cause of rapid deterioration of the tubes.

Unfortunately, the so-called Korean Standard Nuclear Plants from Yonggwang 3,4,5,6 to Ulchin 3,4 have installed the same type of steam generators so far.

The KHNP affirms that it can probe or predict this kind of crack on steam generators’ tubes since it now has experience, and will prevent same kind of “incident” from other nuclear reactors.

However, it didn’t explain clearly why it had failed to investigate the cracks appropriately and how it plans to avoid repeating the same problem.

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CRACKS THREATEN INDUSTRY'S FUTURE

An unnamed official of the Korea Institute of Nuclear Safety (KINS) said it would take several months for the KHNP to find out the exact cause and process of the steam generator tube rupture. However, he added that the nuclear industry will hesitate to reveal the exact cause since "this kind of investigation may harm the reliability of whole nuclear industries as well as the steam generator supplier".

Such potentially embarrassing revelations about nuclear accidents are often hidden in "commercially confidential" reports. Occasionally parts of these reports are revealed. For example, in a report into the Davis-Besse incident, one such report was quoted as saying that cracks in reactor vessel head penetrations were discovered over twice as often in French reactors as in reactors in other countries. Matthieu Schuler from the French nuclear safety authority suggested this was because the French use eddy-current testing to detect cracks rather than the ultrasonic methods often used elsewhere, including in the US (see *WISE/NIRS Nuclear Monitor* 568.5402, "Large numbers of undetected cracks in the world's PWRs").

However, the recent Korean incident throws doubt even on the eddy-current testing method, since the two types of testing used - Bobbin and Motorized Rotating Pancake Coil (MRPC) - are both forms of eddy-current testing. True, they revealed crack indications, but the utility was unable to predict that these would lead to catastrophic failure of the tube. Indeed, despite decades of research in universities all over the world and data from hundreds of reactors, there is still no reliable method of predicting crack growth.

This, of course, has not stopped the US Nuclear Regulatory Commission from extending the licenses of some reactors to as much as 60 years. Since no power reactor has been in operation for this long, this means that the old reactors will enter unknown territory, with increasing numbers of cracks, and more chance that the cracks may lead to catastrophic failure as the metal becomes more and more embrittled from decades of irradiation.

Green Korea United report, 19 June 2002; WISE Amsterdam

SELLAFIELD RADIATION RISK CONFIRMED BY NEW HEALTH STUDY

A new report confirms the late Professor Martin Gardner's hypothesis that Paternal Preconceptional Irradiation (PPI) is a risk factor for leukaemia and non-Hodgkin's lymphoma (NHL) in children of male Sellafield radiation workers. The effect may not be confined to Seascale and cannot be explained by population mixing.

(570.5418) CORE - The study was reported by journalist Rob Edwards in the *New Scientist* on 20 June. New research, with wider temporal and geographical boundaries than the original hypothesis put forward by the late Professor Martin Gardner in 1990.

Prof. Gardner, who died in January 1993, suggested in his report (1) that Sellafield men's exposure to ionizing radiation in the course of their work led to mutations in their sperm which increased substantially the risk of leukemia in their children (The Gardner Hypothesis).

The new report not only confirms his original research showing an increased dose response risk of cancer in children of male Sellafield

radiation workers, but also confirms that this risk was significantly increased with the father's total preconceptional external radiation dose.

Authors Heather Dickinson and Louise Parker from the North of England Children's Cancer Research Unit at the University of Newcastle confirm in their report (2) that children of radiation workers born outside Seascale had a 2-fold risk, but children under 7 who were born in Seascale between 1950 and 1991 had a highly significant 15-fold risk of getting leukemia and Non-Hodgkin's lymphoma. This risk was raised significantly as external parental preconceptional irradiation (PPI) increased.

This dose response was unlikely to be explained by population mixing - a theory put forward by Professor Leo Kinlen, which claims that people moving to the area (e.g. to work at Sellafield) result in the spread of a virus which causes leukemia (3) even though no such virus has yet been found (4).

The researchers also said that the possibilities of the PPI effect could not be excluded outside Seascale. Children whose fathers were monitored for exposure to natural uranium before conception were also shown to have an increased risk.

The fact that Sellafield workers have had the highest radiation doses of any in the nuclear industry in Western Europe or North America

gives the study the greater statistical power. The team concluded that implications of these findings for the current Nuclear Industry workforce should be viewed cautiously since current occupational exposure was low compared to earlier decades.

The Seascale leukemia cluster

Leukemia around Sellafield has a long story (5). A TV documentary 18 years ago reporting an unexpectedly large number of leukaemias in young people in Seascale near Sellafield, Cumbria led to much scientific research.

BNFL's Health and Safety director at the time, Dr. Roger Berry suggested after the shock report that potential fathers might be moved from areas of high radiation and told a press conference at Sellafield "If somebody is that worried it may be the proper advice not to have a family".

The Gardner report led to a High Court case in 1992, costing £10million (US\$15 million), in which two Cumbrian families, Hope and Reay, sought compensation from BNFL.

In both cases the fathers had suffered high radiation exposure while working at Sellafield. During the case BNFL produced a great deal of new evidence which led the judge to believe that the hypothesis was wrong. The families lost the case.

In May 1993 BNFL's Chief Medical Officer, Dr. Andy Slovak, wrote in the BNFL News complaining about the downbeat national press coverage of research suggesting that population mixing was the cause of the Seascale cancers and announced that the "chickens were coming home to roost for the Gardner theory". In October of that year he announced that "the Gardner theory returns to what it always was, just an association of no particular significance" (6).

In 1994 eminent cancer specialist, Sir Richard Doll, announced that evidence showed that the Gardner hypothesis was wrong and that paternal exposure was not to blame (7).

In late April 2002, in briefing Sellafield Local Liaison Committee's Environmental Health Sub Committee on the study, a spokesman for Sellafield's research satellite at Westlakes promoted population mixing at the expense of the PPI impact shown in the study.

Slap in the face to BNFL

The new research is a slap in the face to BNFL and the nuclear industry as a whole, who have consistently disputed and discredited Gardner's work for the last 12 years. CORE campaigner Janine Allis-Smith welcomed the vindication of Martin Gardner's 1990 findings and said:

"We have always believed Gardner was right. Sellafield is the dirtiest plant in the Western world with the highest radiation doses to its workers. Gardner's work has withstood everything the Nuclear industry has thrown at it in its attempt to discredit it. It is deplorable and shameful that BNFL have consistently led workers to believe that Gardner was wrong, that it was just an association of no particular importance and that radiation exposure could not harm their future children. It comes as no surprise that BNFL have been uncharacteristically quiet in the media about this research which was published nearly three months ago."

References

- (1) Results of a case-control study of Leukaemia and lymphoma among young people near Sellafield nuclear plant in West Cumbria, *British Medical Journal* 300, 1990
- (2) Leukaemia and Non-Hodgkin's Lymphoma in Children of Male Sellafield Radiation Workers, *Int. J. Cancer*. 99, 437- 444, 26 March 2002. The research was funded by Westlakes Research Institute and the North of England Children's Cancer Research Fund.
- (3) Epidemiological evidence for an infective basis in childhood leukaemia. *Br. J. Cancer* 71, 1995.
- (4) *WISE News Communiqué* 516.5068, "Sellafield: Population mixing cancer theory again pushed forward"
- (5) *WISE News Communiqué* 509/10.5009, "The Sellafield story".
- (6) *BNFL News*, October 1993
- (7) *Nature*, vol. 367, 24 February 1992.

Source: CORE press release, 19 June 2002

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ALICESTEWART (1906-2002)

Alice Stewart, winner of the Right Livelihood Award for her pioneering work on low-level radiation research, died in Oxford, U.K. at the age of 95. She began her career as a clinical physician, becoming in 1946 the youngest woman ever to be elected a Fellow of the Royal College of Physicians, and then turned to social medicine. Her studies of the effect of radiation began when she looked for an explanation of the increase in childhood cancer. Her classic 1958 paper, which showed that children who had been X-rayed while in the womb had an increased risk of cancer, remains one of the most quoted papers in medical literature. This result alarmed both the nuclear industry and the medical establishment, but those who tried to disprove her results usually ended up confirming them.

Later, she was involved in a study of workers at the Hanford nuclear complex in the US, and again found a cancer risk at supposedly safe dose levels. Her other results include a finding that the risk of radiation-induced cancer increases dramatically after the age of 40 (see *WISE News Communiqué* 402.3918, "Radiation induced cancer risks increase with age"). Age, however, certainly did not stop Alice; half of her scientific publications date from after her retirement. At the age of 89 she was made honorary professor of the University of Birmingham.

U.S.: FATE OF MOAB URANIUM MILL TAILINGS PILE STILL UNDETERMINED

The U.S. National Academy of Sciences has called for more study before a decision is made on the management option to be pursued for the Atlas Moab uranium mill tailings, which continue to leak into the Colorado River – the main source of drinking water for 25 million Americans.

(570.5419) WISE Uranium – The 10.9 million t uranium mill tailings pile located near Moab, Utah (t = metric ton in this article). The Academy in particular draws attention to the long-term hazards such as anticipated migration of the bed of the Colorado River towards the pile, and the appropriate consideration of continued long-term management cost vs. actual reclamation cost.

The 52.6-hectare pile is located 230 meters from the bank of the Colorado River and is a source of continuous toxic seepage into groundwater and into the river. The Colorado River is the main source of drinking water for about 25 million downstream residents in Arizona and California.

The tailings are the byproduct of processing uranium ores from many small mines in the area in the Moab uranium mill between 1956 and

1984, when the mill was shut down by its then owner Atlas Corp. Atlas Corp's reclamation plan provided for capping the pile in place at an estimated cost of US\$13 - 16 million. The government was set to reimburse 56% of this cost, that is the fraction related to the processing of uranium produced for the nuclear weapons program. So, Atlas Corp., in agreement with the regulating authority NRC, set aside US\$6.5 million in the form of a surety bond to cover the remaining part of the reclamation cost.

So far, the story went on as usual, but then a few things happened leading to the current situation that the fate of the pile is still unclear 18 years after it ceased operation. Other federal agencies, such as the Environmental Protection Agency (EPA) and the Fish and Wildlife Service (FWS), along with environmental organizations such as the Grand Canyon Trust, opposed the reclamation of the tailings in place and called for their relocation to a more suitable site. These opinions were assimilated by the downstream states concerned for their drinking water.

One big question was, however, who would pay for the much higher cost of relocation compared to the capping in place. Meanwhile, however, even the estimates for the reclamation in place had risen and Atlas Corp declared bankrupt since it was not able to provide additional money. Subsequently, NRC named a trustee, Pricewaterhouse Coopers, to perform the reclamation in place.

In January 2000, the Department of Energy (DOE) came up with a plan

for the relocation of the pile. DOE has successfully relocated a number of, though smaller, uranium mill tailings piles in the past.

Two preconditions had to be met to make this plan a viable option: the title for the pile (still with NRC) had to be transferred to the DOE, and money had to be provided for the estimated relocation cost of \$300 million.

In October 2000, Congress enacted a bill, providing for those preconditions - at least as it seemed at that time. Subsequently, ownership for the site was indeed transferred to the DOE, but, newly elected President Bush allocated no funds for the relocation.

In October 2001, the DOE presented a Draft Preliminary Plan for Remediation, analyzing the options of reclamation in place and of relocation in more detail. The cost estimates dramatically rose to US\$114 million and US\$364 million, respectively. As ordered by Congress, this Draft Plan was submitted to the National Academy for review.

In the meantime, several companies made proposals for differing relocation options at lower cost: Plateau Resources, a subsidiary of U.S. Energy Corp., proposed to relocate the tailings to its Shootaring Canyon mill site, International Uranium Corp. (IUC) proposed a slurry pipeline for the tailings' relocation to its White Mesa Mill site near Blanding, and Summo Minerals proposed to truck the tailings to its Lisbon Valley site. Also in the meantime, the trustee continued its work for the reclamation in place.

WHAT ARE TAILINGS?

Uranium mill tailings are what is left over from the extraction of uranium from uranium ore. They contain most of the volume and 85% of the initial radioactivity of the ore. They are normally dumped as a sludge in special ponds or piles, where they are often abandoned, forming a radioactive and chemically toxic hazard. The hazard can be reduced by reclamation, which is intended to confine the radioactive and toxic contaminants in a safe and maintenance-free condition, for example by dewatering the tailings and covering them with layers of protective materials.

WISE Uranium web site

In order to place the final cover on top of the tailings pile, the tailings first need to be dewatered. Otherwise, the tailings mass would consolidate under the cover mass and the cover would crack shortly after installation.

The dewatering was to be achieved by wick drains installed from the surface of the pile. The wicks are combined with an intermediate preload cover, the weight of which would help to “squeeze” the liquid out of the tailings.

Approx. 360,000 meters of vertical wick drains were installed in 2000 to accelerate tailings consolidation and provide hydraulic relief prior to placing the final cover. The dewatering, however, turned out to be less effective than anticipated since not enough funds had been available to cover the tailings with the necessary preload for the wicks to become most effective.

While this dewatering effort makes sense for most of the management options considered, it would become obsolete, if IUC’s slurry pipeline relocation proposal would be selected: in this case, the tailings would again have to be mixed with water to form a slurry that can be pumped through the proposed pipeline.

What can we learn from the Atlas Moab case?

Most impressive is the rise in the cost estimates for the reclamation of the tailings pile (see Table 1).

	On-site Cap	Relocate
1979 (Atlas)	3.3	
1996 (Atlas)	13 - 16	
1998 (Atlas)	22	
2001 (DOE)	114	364

Only the 1996 estimate was covered by Atlas’ surety bond. Due to the gross increase of even the in-place reclamation cost estimates (not to

speak about the relocation alternative costs), the surety bond became rather useless. That is, the taxpayer will have to pay for the reclamation, while the company that caused the mess simply went bankrupt. So, one question is: why did the NRC approve this grossly underrated reclamation cost estimate?

To put these numbers into perspective, Table 2 compares the specific reclamation cost per tonne tailings and per pound U₃O₈ produced to those incurred at other tailings sites. (1 pound (lb) = 454 g)

	— Moab estimates —			historic average	
	NRC Cap	DOE Cap	DOE Relocate	Title I	Title II
\$/t tailings	1.4	10.5	33.3	68.37	1.51
\$/lb U3O8	0.4	3	9.7	14.70	0.44

(based on costs of 15 / 114 / 364 \$million, estimated uranium production of 14,400 t U, and 10.9 million t tailings)

Title II: sites where the current owner performs the reclamation, supported by partial government reimbursement for tailings resulting from production of uranium for nuclear weapons
 Title I: designated old sites, reclamation exclusively performed by DOE

NRC’s original cost estimate for the cap in-place option thus was well within the average cost observed so far for Title II sites. DOE’s new estimates come closer to the average cost for Title I sites, though even the relocation cost remains below half of the Title I cost.

By coincidence, DOE’s estimate for the relocation cost, expressed as dollars per pound U₃O₈ produced at the Moab mill, is nearly identical to the current uranium spot market price of US\$9.90. In other words: the cleanup would consume the complete sales price of the uranium produced, if sold at current spot prices.

The observation that NRC’s original cost estimate met the average Title II cost, raises the question what the

situation at those sites will be? Are there future disasters looming?

In fact, for most of the major Title II sites, their respective owners have requested so-called “Alternate Concentration Limits” (ACL) for contaminants in groundwater. That is, the owners request relaxed groundwater standards since they are not able (and/or willing) to meet NRC’s groundwater standards.

Those requests most often do not ask for relaxation of certain parameters by some percentage, but by factors such as 100 or 1000. NRC already has

approved many such requests and is to approve the remaining ones shortly.

For details, see also the Moab page on WISE Uranium Project’s web site: www.antenna.nl/wise/uranium/udmoa.html

Source and contact: WISE Uranium

TAIWAN: WELDS FALSIFIED IN NEW SCANDAL AT LUNG MEN

The construction of Taiwan's Fourth NPP (Lungmen), which was halted and then re-instated despite protests involving around 30,000 people, has hit a new scandal. According to the Atomic Energy Council, about 52% of the materials in the reactor pedestal were replaced by "inferior goods which are less pressure-resistant".

(570.5420) WISE Amsterdam - The inferior materials were used in constructing the second to fifth layers of the pedestal which is intended to support the nuclear reactor. According to the Kaohsiung District Prosecutor's Office, inferior welding materials were used at 282 points, and an attempt was made to hide this by covering with materials that meet quality standards. The Atomic Energy Council said that about 52% of materials were replaced with "inferior goods which are less pressure-resistant".

The state-run China Shipbuilding Corp. is responsible for building the reactor pedestal at the 2-reactor nuclear power station for Taipower, the state-owned utility. China Shipbuilding in turn subcontracted the work to New Asia Construction and Development Corporation.

On 15 June, the Ministry of Economic Affairs handed out punishments in the form of demerits to 22 officials of the two state-run firms for "allowing sloppy

workmanship." Not a single high-ranking official was in that list, but prosecutors now say they suspect high-ranking officials of China Shipbuilding or other influential political figures may have received commissions in exchange for awarding contracts to certain subcontractors.

Anti-nuclear activists and lawmakers have demanded an expansion of the investigation, saying that there are probably other construction defects. Lai Wei-chieh, secretary-general of the Green Citizens' Action Alliance, said: "Construction defects surrounding the pedestal were just part of Taipower's problems. We hope prosecutors can probe into the problem of Taipower's failure to supervise plant construction thoroughly."

The construction of Lungmen has been highly controversial, with protests involving tens of thousands of people. The issue even led to the resignation of Tang Fei as premier of Taiwan (see *WISE News*

Communique 535.5204: "Taiwan: Committee votes to stop construction of Lungmen, premier resigns"). Construction was halted in October 2000 (see *WISE News Communique* 538.5217: "Taiwan: Lungmen cancellation announced, political row continues") only to be re-instated in February 2001 (see *WISE News Communique* 543.5245, "Taiwan: two sides to the nuclear coin").

The country's Third Nuclear Power Plant has also recently experienced problems, with a shutdown caused by failure of a component on 6 June and another caused by water spillage from a cracked pipe on 16 June.

Sources: *The Taipei Times Online*, 12, 18 and 23 June 2002

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BELARUS: A GLIMMER OF HOPE FOR PROF. BANDAZHEVSKY?

The situation of Yuri Bandazhevsky, a Belarussian professor of medicine known for his research the effects of the Chernobyl disaster on the people of Belarus, has slightly improved. He remains imprisoned in a labor camp (Gulag) but has been moved to slightly better accommodation, and has been visited by a delegation from the Council of Europe. His case is now being considered by two UN Human Rights bodies in Geneva, Switzerland.

(570.5421) Solange Fernex - On 12 June, the International Federation for Human Rights (FIDH) and the World Organization Against Torture (OMCT), in the framework of their joint program: "The Observatory for the Protection of Human Rights Defenders", submitted to the United Nations Working Group on Arbitrary

Detention, the case of the Belarussian Professor Yuri Bandazhevsky, scientist of world repute specialised in medical research on nuclear activity. The procedure for examination of cases of arbitrary detention is usually shorter than other UN procedures.

On 22 April, a recourse on the case of Prof Yuri I. Bandazhevsky, who is still in the Gulag, had been presented to the Human Rights Committee of the United Nations in Geneva by the vice-president of the Helsinki Committee of Belarus, lawyer Garri Pogoniailo. This recourse is supported by Amnesty International,

WORLD BANK

The World Bank announced on 31 May that it would give a US\$50 million loan to farmers and private businesses in regions of Belarus contaminated by the Chernobyl disaster. Previously the World Bank had refused to lend to Belarus because of the lack of reforms. Belarus has no nuclear power plants of its own, but nevertheless received around 80% of the fallout from the Chernobyl explosion.

Radio Free Europe/Radio Liberty, 4 June 2002

which is accredited to the UN Human Rights Committee, and recognizes Bandazhevsky as a Prisoner of Conscience (see *WISE News Communiqué* 553.5308, "Belarus:

Dutch NPP closure postponed? In the negotiations on a new Dutch government coalition (after parliament elections in May) it was agreed that the Borssele nuclear power station would not close at the end of 2003. In the draft government agreement, the Christian Democrats (CDA), the Liberals (VVD) and the Pim Fortuyn List have laid down that an early closure of Borssele would not be advisable in the light of the greenhouse gas reduction commitments.

After the Dutch parliament voted in 1995 for a closure of Borssele before 2004, the government agreed with the owner on that closure date. Owner EPZ (now Essent) however denied that such a date was agreed, which is now the subject of an appeal court case (see *WISE News Communiqué* 551.5290: "Netherlands: court case on closure date Borssele NPP"). A decision by the appeal court is expected within weeks.

Although the judge might decide that a closure date had indeed been agreed upon in 1995, the new government coalition can reverse

Bandazhevsky adopted as prisoner of conscience").

On the political level, in a letter dated 30 April 2002, the European Union President, Jose Maria Aznar has written a support letter to the Green MEP Marie-Anne Isler Béguin, mentioning the freeze of EU/Belarus bilateral programs pending progress in the field of human rights in Minsk, with the explicit mention of the liberation of Prof. Bandazhevsky as one concrete measure which should be taken. A similar letter was received from Romano Prodi on 8 April 2002.

On 10-12 June, a Mission of the Council of Europe, headed by German Socialist MP Wolfgang Behrend visited Minsk, met Bandazhevsky in prison and asked for

his immediate liberation. Although the appalling conditions of imprisonment of Bandazhevsky have slightly improved at the occasion of this visit, it is extremely important to write for his immediate liberation to President A. Lukashenko, care of the Embassy of Belarus in your country.

The address for writing to Bandazhevsky, who reads English and French as well as Russian, is: Yuri Bandazhevsky, Ul Kalvarijskaya 36, P.O. Box 351, 220600 - Minsk, Belarus (note the new P.O. Box number).

Source and contact: Solange Fernex, President, Women's International League for Peace and Freedom, French section, 114, rue de Vaugirard, 75006 Paris, France
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IN BRIEF

that decision and give Borssele permission to operate after 2004. If Borssele continues its operation after 2004, it would probably choose for a new reprocessing contract with La Hague.

The reprocessing contracts have been subject of political debate and actions. On 19 June, Greenpeace activists delayed a spent fuel transport to La Hague by chaining themselves to the train rails. If Borssele ends its contracts by 2004, the interim storage facility COVRA at Borssele would need to be adapted for the storage of spent fuel.

NOS Teletekst (NL), 16 June 2002; draft government coalition agreement, 22/23 June 2002

USEC deal. The United States Enrichment Corporation (USEC) has signed a deal with the US Department of Energy (DOE) which is designed to ensure the U.S. does not become dependent on foreign sources for nuclear fuel.

Under the agreement, USEC will build an "advanced uranium enrichment plant" by 2011, and also continue the "Megatons to

Megawatts" program under which Russian highly enriched uranium is blended down and converted to nuclear fuel for U.S. reactors. USEC will also continue operating its Paducah, Kentucky diffusion plant until then; its Portsmouth enrichment plant at Piketon, Ohio was closed last year (see *WISE News Communiqué* 549, "In Brief"). Under the deal, contaminated uranium will be cleaned up at Piketon.

However, USEC's financial problems have cast doubts on its ability to finance a new enrichment plant. Also, Paducah is still a world-class destroyer of the ozone layer (see *WISE News Communiqué* 466.4631, "Nuke destroys ozone layer & emits greenhouse gas").

AP, 18 June 2002; WNA Briefing 28 June 2002; Las Vegas Sun, 18 June 2002

Russia: Pasko loses appeal. On 25 June, Russian journalist Grigory Pasko lost his appeal before the Russian Supreme Court against his conviction for treason for writing about the nuclear safety issues of Russia's Pacific Fleet. Amnesty International adopted Pasko as a

prisoner of conscience on 7 January 2002, saying that the prosecution of Pasko appears to be "motivated by political reprisal for exposing the practice of dumping nuclear waste" illegally in the Sea of Japan. For more information, contact Ecopravo at ecopravo@ecopravo.info or Bellona at info@bellona.no

Web sites www.bellona.no and www.seu.ru

Chernobyl deaths in UK. After studying statistics from 15 health authority regions of England and Wales, British scientist John Urquhart has estimated that at least 200 more children than normal died in the three years following the Chernobyl disaster, and more than 600 extra abnormalities (such as Down's Syndrome, spina bifida and cleft palate). Most of the increased deaths and deformities occurred in five of

the fifteen regions studied.

Reuters, 27 June 2002

EU money for fusion research. The European Commission said on 17 June it had approved a budget of 1.23 billion Euros (US\$1.20 billion) for research into nuclear power. Most of the funds – 750 million Euros – are earmarked for nuclear fusion research. Greenpeace nuclear campaigner Tobias Muenchmeyer described this as a waste of money, since even the European Commission's own documents indicate that there is no way fusion can be economical for the next 50 years.

Reuters, 18 June 2002

France: court orders 5-month stop at Bure. A court at Bar-le-Duc in France has ordered a 5-month stop to digging at Bure. Work had been

underway to build a "laboratory" to "study" an underground repository for nuclear waste (see *WISE/NIRS Nuclear Monitor* 562.5369, "Will Bure become the French Yucca Mountain?").

On 15 May, a worker died after a ventilation tube fell on top of him, and last December a worker was seriously injured after a fall of 11 meters. An inspection on 23 May showed that explosives had been used improperly and that a trapdoor was unsafe.

When digging was halted, the main shaft had reached a depth of 226 meters, with the "laboratory" planned for 490 meters depth. The work is already 4.5 million Euros (US\$4.4 million) over budget.

La Tribune, 26 June 2002

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