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Editorial

Dear readers of the WISE/NIRS Nuclear Monitor,

In this issue of the Monitor:

- Dr. Matthew Coon Come from the Grand Council of the Crees writes about the fight against uranium development in Quebec.
- We write about thorium's 'friendly fire' − critical analyses of thorium by nuclear advocates and experts.
- Michael Mariotte, President of the Nuclear Information and Resource Service, writes about Exelon's dirty tricks in Illinois.
- We update the situation following last year's accident at the world's only deep underground dump for nuclear waste, the Waste Isolation Pilot Plant in the US state of New Mexico.
- We also have short items about ecological destruction to make way for a nuclear power plant in Finland, the upcoming Radioactive Exposure Tour in Australia, and the upcoming World Uranium Symposium in Quebec.

Feel free to contact us if you have feedback on this issue of the Monitor, or if there are topics you would like to see covered in future issues.

Regards from the editorial team.

Email: monitor@wiseinternational.org

Monitored this issue:

Ecological destruction in Finland

The Hanhikivi Cape in Finland is being ruined to make way for Fennovoima's nuclear power plant. In addition to damage that has already been done, Fennovoima has permits to cut down about 100 hectares of ecologically valuable area by the end of April, which is one-fifth of the whole Hanhikivi Cape.

The Finnish government's approval of the plant is conditional. There are many unresolved issues such as whether there will be enough Finnish or European stakeholders in the project, and nuclear waste management plans. If the nuclear plant is never built, the ecological destruction will be for nothing.

Local NGO Pro Hanhikivi has worked to protect the area and resist the nuclear project for eight years. Friends of the Earth Finland is organising a 'Better power!' camp to be held in June.

An online petition opposing the planned nuclear plant is posted at http://tinyurl.com/hanhikivi

More information about Hanhikivi Cape:

www.hanhikivi.net/pdf/hanhikivi_brochure_en.pdf

Source: Tiina Prittinen, volunteer with Friends of the Earth Finland, tiina.prittinen@maanystavat.fi

Stand Against Uranium: The James Bay Crees' fight against uranium development

Author: *Grand Chief Dr. Matthew Coon Come − Grand Chief of the Grand Council of the Crees*

NM801.4457 My people, the Eeyouch or James Bay Crees, call our lands Eeyou Istchee, which means "The People's Land". Our territory is located in northern Quebec, on the eastern shore of James Bay and Hudson's Bay. For thousands of years, we have lived off our lands by hunting, fishing and trapping. Our family hunting grounds cover the entire area of Eeyou Istchee. Our people have used and continue to use the entire territory of Eeyou Istchee to practice our traditional way of life.

For thousands of years, our identity has been shaped by our relationship with the land and all that that it contains. Today, we face the very real challenge of maintaining our culture and identity in the context of intensifying development on our territory. Our people continue to practice many aspects of our traditional way of life. We have also fought to ensure that we are active participants in many of the development activities occurring on our lands.

Recently, my people have confronted the challenge of uranium development in Eeyou Istchee. This is not the first time development has threatened our territory and our way of life, and I am certain it will not be the last. It is a challenge that we have taken very seriously.

My people have concluded that the risks associated with uranium development represent an unacceptable threat to our very way of life in Eeyou Istchee. Uranium mining could cause severe and irreparable harm to my people and the animals and lands that sustain us. Radioactive and toxic emissions and wastes from uranium mining will remain with our future generations for hundreds of thousands of years. These risks, and the burdens they create for generations to come, are unacceptable to us.

We have drawn a hard line against uranium development in Eeyou Istchee. The Cree Nation's position is that our consent and participation is required for any and all development on our land. And we have said NO to uranium.

Uranium mining in Eeyou Istchee

The Cree Nation's consideration of and eventual opposition to uranium mining began in 2006 in the community of Mistissini, Quebec, one of the nine communities of the James Bay Cree Nation. In that year, Strateco Resources, a junior mining company, commenced an intensive program of uranium exploration on the family hunting grounds of the Mistissini community in the Otish Mountains. In 2008, Strateco announced its plans to undertake advanced exploration efforts at a site in the Otish mountains at the crest of two major watersheds that bring water to Mistissini and throughout Eeyou Istchee. Eventually, if the results of the advanced exploration project were positive, Strateco intended to build a large-scale uranium mine and mill at this site.

When confronted with this prospect, Mistissini's leaders consulted experts in uranium as well as experts in the land and traditional practices. Town hall meetings were held. The community was polled and the decision was made: Mistissini would not support uranium mining on its territory.

In 2010, the Cree Nation of Mistissini passed a resolution asking the government of Quebec to impose a moratorium on uranium mining on its territory. In 2012, the Grand Council of the Crees – the political organization representing all the Cree communities and people – passed a unanimous resolution banning uranium development throughout all of Eeyou Istchee.

The Cree Nation did not make this decision lightly. We are not anti-development. We support and participate in sustainable and responsible resource development within our territory, in mining, forestry, hydroelectric development and tourism. But uranium is a special case.

Cree consent is required for all development activities on our land. We must be a real partner in development projects in our territory. Our rights must be respected, appropriate measures must be taken to protect the environment, and social and economic benefits must flow to our communities. Most importantly, we cannot support development that is incompatible with Cree values or our way of life.

The Cree Nation's Stand Against Uranium

While there is much that concerns the Cree Nation about uranium development in Eeyou Istchee, there are three areas that are particularly troubling.

First of all, uranium development presents serious health and environmental impacts. We are particularly concerned about the risk of contamination of our water, through a leak, spill or breach. As a result of the river diversions and flooding that accompanied hydroelectric development in Eeyou Istchee, the water bodies in our territory are heavily interconnected As a result, contamination of the water could have far-reaching, disastrous effects on our communities.

For Crees, our health and the environment are deeply interconnected. It is impossible to speak of environmental impacts without also speaking of the health implications that they present. Land on which we can hunt and trap without fear, healthy animals and plants, and uncontaminated drinking water are the building blocks for Cree health. Uranium development presents serious risks to the environment, to our health and, as a result, to our traditional lifestyle.

Secondly, uranium tailings present unique long-term hazards which in turn create long-term technological and institutional challenges that cannot be ignored.

Cree youth walked from Mistissini to Montreal to oppose uranium development in December 2014.

Uranium tailings must be monitored for thousands of years. This time period defies human understanding and generates significant uncertainties and unknowns. It makes long-term stewardship needs impossible to predict and therefore impossible to adequately plan for. At the end of the day, is the local population that truly bears the risks associated with these hazards.

Finally, the inadequacy of the financial guarantees that mining companies are required to set aside for uranium mining projects are a source of concern. This systemic deficiency raises serious questions about who will be responsible for technological failures and unforeseen events if and when they do occur.

The financial guarantees required by Canadian and Quebec regulatory bodies to cover monitoring, remediation and unforeseen events are completely insufficient to deal with the long-term obligations imposed by uranium tailings management. Under the approach adopted by provincial authorities and the Canadian Nuclear Safety Commission, Canada's nuclear industry watchdog, the evaluation of future costs is considered over *decades* not centuries, let alone millennia. There is therefore inadequate funding set aside to remedy the damages that could occur, reinforcing the concern that the local communities will ultimately bear the financial risks along with health and environmental risks.

Standing together against uranium

The Cree Nation has fought hard against uranium development on our land, and our refusal to back down has paid off. In 2013, the Government of Quebec refused to grant Strateco a permit to begin advanced uranium exploration efforts. The Government's decision was largely due to the fact that the project lacked social acceptability amongst the Crees, the population that would be most directly impacted by the project.

The Government of Quebec has also mandated the *Bureau d'audiences publiques sur l'environnement* (BAPE), Quebec's environmental watchdog, to hold public hearings and undertake a review of the industry. The Government declared a moratorium on uranium mining until the BAPE issues its recommendations.

The BAPE held public hearings throughout the province, including in Eeyou Istchee, from May to December 2014. In December 2014, as the BAPE hearings were coming to a close in Montreal, a group of Cree youth marched over 850 km through Northern Quebec, braving the elements of the Canadian winter, to hand-deliver this message to BAPE: the Cree Nation stands united in its opposition to uranium development in Eeyou Istchee, our traditional territory.

We have said from the start that once Quebecers learned the true facts about uranium development, they will join the Cree Nation in our stand against uranium. The Cree Marchers experienced this firsthand: in every community they passed through, Quebecers came out to support their position and march with them. The BAPE hearings also proved this to be true. During the BAPE's public hearings, the opposition to uranium mining in the province was overwhelming. In fact, the BAPE received more submissions regarding uranium that it had ever received for any environmental hearing it had ever conducted. It has never been more obvious that Quebec as a whole stands with the Cree Nation in our opposition to uranium.

We are grateful for the support of our allies. This support has never been more crucial. In May 2015, the BAPE will be issuing its recommendations to the Government of Quebec, and our stand must remain unwavering. Two upcoming events in Quebec will help keep uranium in the spotlight: the World Uranium Symposium will be held in Quebec City from April 14 to 16, and the International Uranium Film Festival will be held in Quebec City from April 15 to 25, with additional screenings in Mistissini (April 18) and Montreal (April 23).

Now, more than ever, the Cree Nation, its allies and all of Quebec must stand united against uranium development. There are considerable benefits associated with development, but the challenges associated with uranium mining are numerous and cannot be ignored. For the Cree Nation of Eeyou Istchee, the long-term management of uranium tailings and the stewardship obligations imposed on future generations are fundamentally incompatible with Cree values, culture and way of life. For this reason, we have taken a Stand Against Uranium. We invite you to stand with us.

Matthew Coon Come is the Grand Chief of the Grand Council of the Crees, the political body representing the Cree Nation of Eeyou Istchee (Quebec). He is known throughout Canada and internationally for his tireless leadership and advocacy to protect and advance the aboriginal, treaty and other human rights of indigenous peoples in Canada and internationally.

***Stand Against Uranium**:*

http://standagainsturanium.com

www.facebook.com/jamesbaycreeagainsturanium

#StandAgainstUranium

Grand Council of the Crees:

www.gcc.ca

World Uranium Symposium

The World Uranium Symposium will be held in Quebec City, Canada, from April 14 to 16. The Symposium will address issues arising from the life cycle of uranium, from mining to its end-uses and byproducts for civilian or military purposes. Both scientific and community-based, the Symposium is organized around the following themes: health, environment, economy, ethics, governance, human rights and the rights of indigenous peoples.

The Symposium is jointly organized by Physicians for Global Survival, the Canadian Association of Physicians for the Environment, Nature Quebec, the Canadian Coalition for Nuclear Responsibility, and the Coalition pour que le Québec ait meilleure mine. It also receives support from the International Physicians for the Prevention of Nuclear War (Swiss chapter), the First Nations of Quebec and Labrador Sustainable Development Institute, the Cree Nation of Mistissini, MiningWatch Canada, and a number of other local, national and international partners.

http://uranium2015.com/en

Thor-bores and uro-sceptics: thorium's friendly fire

Author: *Jim Green − Nuclear Monitor editor*

NM801.4458 Many *Nuclear Monitor* readers will be familiar with the tiresome rhetoric of thorium enthusiasts − let's call them thor-bores. Their arguments have little merit but they refuse to go away.

Here's a thor-bore in full flight − a science journalist who should know better:

"Thorium is a superior nuclear fuel to uranium in almost every conceivable way ... If there is such a thing as green nuclear power, thorium is it. ... For one, a thorium-powered nuclear reactor can never undergo a meltdown. It just can't. ... Thorium is also thoroughly useless for making nuclear weapons. ... But wait, there's more. Thorium doesn't only produce less waste, it can be used to consume existing waste."[1]

Thankfully, there is a healthy degree of scepticism about thorium, even among nuclear industry insiders, experts and enthusiasts (other than the thor-bores themselves, of course). Some of that 'friendly fire' is noted here.

Readiness

The World Nuclear Association (WNA) notes that the commercialization of thorium fuels faces some "significant hurdles in terms of building an economic case to undertake the necessary development work." The WNA states:

"A great deal of testing, analysis and licensing and qualification work is required before any thorium fuel can enter into service. This is expensive and will not eventuate without a clear business case and government support. Also, uranium is abundant and cheap and forms only a small part of the cost of nuclear electricity generation, so there are no real incentives for investment in a new fuel type that may save uranium resources.

"Other impediments to the development of thorium fuel cycle are the higher cost of fuel fabrication and the cost of reprocessing to provide the fissile plutonium driver material. The high cost of fuel fabrication (for solid fuel) is due partly to the high level of radioactivity that builds up in U-233 chemically separated from the irradiated thorium fuel. Separated U-233 is always contaminated with traces of U-232 which decays (with a 69-year half-life) to daughter nuclides such as thallium-208 that are high-energy gamma emitters. Although this confers proliferation resistance to the fuel cycle by making U-233 hard to handle and easy to detect, it results in increased costs. There are similar problems in recycling thorium itself due to highly radioactive Th-228 (an alpha emitter with two-year half life) present."[2]

A 2012 report by the UK National Nuclear Laboratory states:

"NNL has assessed the Technology Readiness Levels (TRLs) of the thorium fuel cycle. For all of the system options more work is needed at the fundamental level to establish the basic knowledge and understanding. Thorium reprocessing and waste management are poorly understood. The thorium fuel cycle cannot be considered to be mature in any area."[3]

Fiona Rayment from the UK National Nuclear Laboratory states:

"It is conceivable that thorium could be introduced in current generation reactors within about 15 years, if there was a clear economic benefit to utilities. This would be a once-through fuel cycle that would partly realise the strategic benefits of thorium.

"To obtain the full strategic benefit of the thorium fuel cycle would require recycle, for which the technological development timescale is longer, probably 25 to 30 years.

"To develop radical new reactor designs, specifically designed around thorium, would take at least 30 years. It will therefore be some time before the thorium fuel cycle can realistically be expected to make a significant contribution to emissions reductions targets."[4]

Thorium is no 'silver bullet'

Do thorium reactors potentially offer significant advantages compared to conventional uranium reactors?

Nuclear physicist Prof. George Dracoulis states: “Some of the rhetoric associated with thorium gives the impression that thorium is, somehow, magical. In reality it isn’t.”[5]

The UK National Nuclear Laboratory report argues that thorium has “theoretical advantages regarding sustainability, reducing radiotoxicity and reducing proliferation risk” but that “while there is some justification for these benefits, they are often over stated.” The report further states that the purported benefits “have yet to be demonstrated or substantiated, particularly in a commercial or regulatory environment.”[3]

The UK National Nuclear Laboratory report is sceptical about safety claims:

“Thorium fuelled reactors have already been advocated as being inherently safer than LWRs [light water reactors], but the basis of these claims is not sufficiently substantiated and will not be for many years, if at all.”[3]

False distinction

Thor-bores posit a sharp distinction between thorium and uranium. But there is little to distinguish the two. A much more important distinction is between conventional reactor technology and some ‘Generation IV’ concepts − in particular, those based on repeated (or continuous) fuel recycling and the ‘breeding’ of fissile isotopes from fertile isotopes (Th-232>U-233 or U-238>Pu-239).

A report by the Idaho National Laboratory states:

“For fuel type, either uranium-based or thorium-based, it is only in the case of continuous recycle where these two fuel types exhibit different characteristics, and it is important to emphasize that this difference only exists for a fissile breeder strategy. The comparison between the thorium/U-233 and uranium/Pu-239 option shows that the thorium option would have lower, but probably not significantly lower, TRU [transuranic waste] inventory and disposal requirements, both having essentially equivalent proliferation risks.

“For these reasons, the choice between uranium-based fuel and thorium-based fuels is seen basically as one of preference, with no fundamental difference in addressing the nuclear power issues.

“Since no infrastructure currently exists in the U.S. for thorium-based fuels, and processing of thorium-based fuels is at a lower level of technical maturity when compared to processing of uranium-based fuels, costs and RD&D requirements for using thorium are anticipated to be higher.”[7]

George Dracoulis takes issue with the “particularly silly claim” by a science journalist (and many others) that almost all the thorium is usable as fuel compared to just 0.7% of uranium (i.e. uranium-235), and that thorium can therefore power civilization for millennia. Dracoulis states:

“In fact, in that sense, none of the thorium is usable since it is not fissile. The comparison should be with the analogous fertile isotope uranium-238, which makes up nearly 100% of natural uranium. If you wanted to go that way (breeding that is), there is already enough uranium-238 to ‘power civilization for millennia’.”[5]

Some Generation IV concepts promise major advantages, such as the potential to use long-lived nuclear waste and weapons-usable material (esp. plutonium) as reactor fuel. On the other hand, Generation IV concepts are generally those that face the greatest technical challenges and are the furthest away from commercial deployment; and they will gobble up a great deal of R&D funding before they gobble up any waste or weapons material.

Moreover, uranium/plutonium fast reactor technology might more accurately be described as failed Generation I technology. The first reactor to produce electricity − the EBR-I fast reactor in the US, a.k.a. Zinn’s Infernal Pile − suffered a partial fuel meltdown in 1955. The subsequent history of fast reactors has largely been one of extremely expensive, underperforming and accident-prone reactors which have contributed far more to WMD proliferation problems than to the resolution of those problems.

Most importantly, whether Generation IV concepts deliver on their potential depends on a myriad of factors − not just the resolution of technical challenges. India’s fast reactor / thorium program illustrates how badly things can go wrong, and it illustrates problems that can’t be solved with technical innovation. John Carlson, a nuclear advocate and former Director-General of the Australian Safeguards and Non-Proliferation Office, writes:

“India has a plan to produce [weapons-grade] plutonium in fast breeder reactors for use as driver fuel in thorium reactors. This is problematic on non-proliferation and nuclear security grounds. Pakistan believes the real purpose of the fast breeder program is to produce plutonium for weapons (so this plan raises tensions between the two countries); and transport and use of weapons-grade plutonium in civil reactors presents a serious terrorism risk (weapons-grade material would be a priority target for seizure by terrorists).”[8]

Generation IV thorium concepts such as molten salt reactors (MSR) have a lengthy, uncertain R&D road ahead of them − notwithstanding the fact that there is some previous R&D to build upon.[4,9]

Kirk Sorensen, founder of a US firm which aims to build a demonstration ‘liquid fluoride thorium reactor’ (a type of MSR), notes that “several technical hurdles” confront thorium-fuelled MSRs, including materials corrosion, reactor control and in-line processing of the fuel.[4]

George Dracoulis writes:

“MSRs are not currently available at an industrial scale, but test reactors with different configurations have operated for extended periods in the past. But there are a number of technical challenges that have been encountered along the way. One such challenge is that the hot beryllium and lithium “salts” – in which the fuel and heavy wastes are dissolved – are highly reactive and corrosive. Building a large-scale system that can operate reliably for decades is non-trivial. That said, many of the components have been the subject of extensive research programs.”[10]

Weapons proliferation

Claims that thorium reactors would be proliferation-resistant or proliferation-proof do not stand up to scrutiny.[11] Irradiation of thorium-232 produces uranium-233, which can be and has been used in nuclear weapons.

The World Nuclear Association states:

"The USA produced about 2 tonnes of U-233 from thorium during the 'Cold War', at various levels of chemical and isotopic purity, in plutonium production reactors. It is possible to use U-233 in a nuclear weapon, and in 1955 the USA detonated a device with a plutonium-U-233 composite pit, in Operation Teapot. The explosive yield was less than anticipated, at 22 kilotons. In 1998 India detonated a very small device based on U-233 called Shakti V."[2]

According to Assoc. Prof. Nigel Marks, both the US and the USSR tested uranium-233 bombs in 1955.[6]

Uranium-233 is contaminated with uranium-232 but there are ways around that problem. Kang and von Hippel note:

"[J]ust as it is possible to produce weapon-grade plutonium in low-burnup fuel, it is also practical to use heavy-water reactors to produce U-233 containing only a few ppm of U-232 if the thorium is segregated in "target" channels and discharged a few times more frequently than the natural-uranium "driver" fuel."[12]

John Carlson discusses the proliferation risks associated with thorium:

"The thorium fuel cycle has similarities to the fast neutron fuel cycle – it depends on breeding fissile material (U-233) in the reactor, and reprocessing to recover this fissile material for recycle. ...

"Proponents argue that the thorium fuel cycle is proliferation resistant because it does not produce plutonium. Proponents claim that it is not practicable to use U-233 for nuclear weapons.

"There is no doubt that use of U-233 for nuclear weapons would present significant technical difficulties, due to the high gamma radiation and heat output arising from decay of U-232 which is unavoidably produced with U-233. Heat levels would become excessive within a few weeks, degrading the high explosive and electronic components of a weapon and making use of U-233 impracticable for stockpiled weapons. However, it would be possible to develop strategies to deal with these drawbacks, e.g. designing weapons where the fissile "pit" (the core of the nuclear weapon) is not inserted until required, and where ongoing production and treatment of U-233 allows for pits to be continually replaced. This might not be practical for a large arsenal, but could certainly be done on a small scale.

"In addition, there are other considerations. A thorium reactor requires initial core fuel – LEU or plutonium – until it reaches the point where it is producing sufficient U-233 for self-sustainability, so the cycle is not entirely free of issues applying to the uranium fuel cycle (i.e. requirement for enrichment or reprocessing). Further, while the thorium cycle can be self-sustaining on produced U-233, it is much more efficient if the U-233 is supplemented by additional "driver" fuel, such as LEU or plutonium. For example, India, which has spent some decades developing a comprehensive thorium fuel cycle concept, is proposing production of weapons grade plutonium in fast breeder reactors specifically for use as driver fuel for thorium reactors. This approach has obvious problems in terms of proliferation and terrorism risks.

"A concept for a liquid fuel thorium reactor is under consideration (in which the thorium/uranium fuel would be dissolved in molten fluoride salts), which would avoid the need for reprocessing to separate U-233. If it proceeds, this concept would have non-proliferation advantages.

"Finally, it cannot be excluded that a thorium reactor – as in the case of other reactors – could be used for plutonium production through irradiation of uranium targets.

"Arguments that the thorium fuel cycle is inherently proliferation resistant are overstated. In some circumstances the thorium cycle could involve significant proliferation risks."[13]

Sometimes thor-bores posit conspiracy theories. Former International Atomic Energy Agency Director-General Hans Blix said "it is almost impossible to make a bomb out of thorium" and thorium is being held back by the "vested interests" of the uranium-based nuclear industry.[14]

But Julian Kelly from Thor Energy, a Norwegian company developing and testing thorium-plutonium fuels for use in commercial light water reactors, states:

"Conspiracy theories about funding denials for thorium work are for the entertainment sector. A greater risk is that there will be a classic R&D bubble [that] divides R&D effort and investment into fragmented camps and feifdoms."[4]

Thor-bores and uro-sceptics

Might the considered opinions of nuclear insiders, experts and enthusiasts help to shut the thor-bores up? Perhaps not − critics are dismissed with claims that they have ideological or financial connections to the vested interests of the uranium-based nuclear industry, or they are dismissed with claims that they are ideologically opposed to all things nuclear. But we live in hope.

Thor-bores do serve one useful purpose − they sometimes serve up pointed criticisms of the uranium fuel cycle. In other words, some thor-bores are uro-sceptics. For example, thorium enthusiast and former Shell executive John Hofmeister states:

"The days of nuclear power based upon uranium-based fission are coming to a close because the fear of nuclear proliferation, the reality of nuclear waste and the difficulty of managing it have proven too difficult over time."[15]

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Exelon plays dirty in Illinois

Author: *Michael Mariotte − President, Nuclear Information and Resource Service*

NM801.4459 It should surprise no-one that a utility that relies on dirty energy to make its money also plays dirty when its money is threatened or when a state legislature is considering whether to bail out the company with its constituents' money.

So don't be surprised that yes indeed, gasp, Exelon is playing dirty in Illinois. And just about everywhere else too.

Dave Kraft of Illinois' Nuclear Energy Information Service (NEIS) reports that some NEIS members have received unidentified robocalls on their home phones, urging them to call their state legislators to "support clean renewable energy."

The problem is, the bill the robocalls support is Exelon's bill to establish a "low carbon portfolio standard" − that's the bill that was written to bail out Exelon's uneconomic reactors in Illinois and prevent the expansion of "clean renewable energy" in the state.[1]

NEIS, the Nuclear Information and Resource Service (NIRS) and those honestly in favor of clean energy are supporting a different bill also before the legislature, SB 1485/HB 2607, that actually would encourage clean energy in the state − and wouldn't bail out Exelon's failing nukes in the process.

Crain's Chicago Business, which continues to be the best source of reporting on Exelon and its machinations, recently reported that Exelon subsidiary Commonwealth Edison − the state's largest distribution utility − "wants to make it illegal in Illinois to count the benefits of lowering energy prices when deciding which energy efficiency projects should qualify for ratepayer-funded financial assistance."[2]

In other words, while even Commonwealth Edison can't discount the fact that energy efficiency is cleaner than electricity generation, it wants the other main benefit of improving efficiency − lower electricity prices for ratepayers − to be ignored entirely.

Why? Because holding back gains in energy efficiency would help out Exelon's six uneconomic reactors. Improving efficiency means less generation is needed. By attempting to sabotage the state's efficiency programs, Commonwealth Edison is trying to ensure that electricity demand goes up, making it at least somewhat more likely those reactors would be useful. In fact, those reactors still wouldn't be needed; but the numbers conceivably could be manipulated enough to make it appear so.

It is vital that we reach everyone possible in Illinois to counter Exelon's proposed nuclear bailout. That's a bailout that would cost ratepayers hundreds of millions of dollars and provide them with nothing but the electricity they would receive even without the bailout. But instead of coming from cleaner energy sources, and helping to expand Illinois' clean energy programs, the bailout would ensure that Illinois' power would continue to come from dirty, aging and expensive nuclear reactors.

Stopping Exelon's efforts to promote nuclear power at the expense of renewables and energy efficiency is the most important state action this year − and the outcome will have national implications.[3]

If you have any friends at all, any relatives, business colleagues, if a part of any e-mail list you're on, includes anyone from Illinois, please send them this link to the NIRS action page: http://tinyurl.com/exelon-nukes

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One deep underground dump, one dud

Author: *Jim Green − Nuclear Monitor editor*

NM801.4460 There is only one deep underground dump (DUD) for nuclear waste anywhere in the world, and it's a dud. The broad outline of this dud DUD story is simple and predictable: over a period of 10−15 years, high standards gave way to complacency, cost-cutting and corner-cutting.

The Waste Isolation Pilot Plant (WIPP) in New Mexico, USA, is a burial site for long-lived intermediate-level waste from the US nuclear weapons program. More than 171,000 waste drums have been stored in salt caverns 2,100 feet (640 metres) underground since WIPP opened in 1999.

Earl Potter, a lawyer who represented Westinghouse, WIPP's first operating contractor, said: "At the beginning, there was an almost fanatical attention to safety. I'm afraid the emphasis shifted to looking at how quickly and how inexpensively they could dispose of this waste."[1]

Likewise, Rick Fuentes, president of the Carlsbad chapter of the United Steelworkers union, said: "In the early days, we had to prove to the stakeholders that we could operate this place safely for both people and the environment. After time, complacency set in. Money didn't get invested into the equipment and the things it should have."[1]

Before WIPP opened, sceptical locals were invited to watch experiments to assure them how safe the facility would be. Waste containers were dropped from great heights onto metal spikes, submerged in water and rammed by trains.[1] Little did they know that a typo and kitty litter would be the undoing of WIPP.

On 14 February 2014, a drum rupture spread contaminants through about one-third of the underground caverns and tunnels, up the exhaust shaft, and into the outside environment. Twenty-two people were contaminated with low-level radioactivity.

A Technical Assessment Team convened by the US Department of Energy (DoE) has recently released a report into the February 2014 accident.[2] The report concludes that just one drum was the source of radioactive contamination, and that the drum rupture resulted from internal chemical reactions.

Chemically incompatible contents in the drum − nitrate salt residues, organic sorbent and an acid neutralization agent − supported heat-generating chemical reactions which led to the creation of gases within the drum. The build-up of gases displaced the drum lid, venting radioactive material and hot matter that further reacted with the air or other materials outside the drum to cause the observed damage.

Kitty litter

The problems began at Los Alamos National Laboratory (LANL), where the drum was packed. One of the problems at LANL was the replacement of inorganic absorbent with an organic absorbent − kitty litter. Carbohydrates in the kitty litter provided fuel for a chemical reaction with metal nitrate salts being disposed of.

The switch to kitty litter took effect on 1 August 2012. LANL staff were explicitly directed to "ENSURE an organic absorbent (kitty litter) is added to the waste" when packaging drums of nitrate salts. LANL's use of organic kitty litter defied clear instructions from WIPP to use an inorganic absorbent.[3]

Why switch from inorganic absorbent to organic kitty litter? The most likely explanation is that the problem originated with a typo in notes from a meeting at LANL about how to package "difficult" waste for shipment to WIPP − and the subsequent failure of anyone at LANL to correct the error. In email correspondence, Mark Pearcy, a member of the team that reviews waste to ensure it is acceptable to be stored at WIPP, said: "General consensus is that the 'organic' designation was a typo that wasn't caught."[3]

LANL officials have since acknowledged several violations of its Hazardous Waste Facility Permit including the failure to follow proper procedures in making the switch to organic litter, and the lack of follow-up on waste that tests showed to be highly acidic.[4]

Ongoing risks

The heat generated by the rupture of drum #68660 may have destabilized up to 55 other drums that were in close proximity. A June 2014 report by LANL staff based at WIPP said the heat "may have dried out some of the unreacted oxidizer-organic mixtures increasing their potential for spontaneous reaction. The dehydration of the fuel-oxidizer mixtures caused by the heating of the drums is recognized as a condition known to increase the potential for reaction."[5]

The Albuquerque Journal reported on March 15 that 368 drums with waste comparable to drum #68660 are stored underground at WIPP − 313 in Panel 6, and 55 in Room 7 of Panel 7, the same room as drum #68660. WIPP operators are trying to isolate areas considered to be at risk with chain links, brattice cloth to restrict air flow, mined salt buffers and steel bulkheads. Efforts to shut off particular rooms and panels have been delayed and complicated by radiological contamination, limitations on the number of workers and equipment that can be used due to poor ventilation, and months of missed maintenance that followed the February 2014 accident.[6]

An *Associated Press* report states that since September 2012, LANL packed up to 5,565 drums with organic kitty litter. Of particular concern are 16 drums with highly acidic contents as well as nitrate salts. Of those 16 drums, 11 are underground at WIPP (one of them is drum #68660), and the other five are in temporary storage at a private waste facility in Andrews, Texas.[4]

Freedom of Information revelations

The Santa Fe *New Mexican* newspaper has revealed further details about problems before and after the February 2014 accident, based on material from a Freedom of Information Act request.[3]

The *New Mexican* reports that LANL workers came across a batch of waste that was highly acidic, making it unsafe for shipping. A careful review of treatment options should have followed, but instead LANL and its contractors took shortcuts, adding acid neutralizer as well as kitty litter to absorb excess liquid. The wrong neutralizer was used, exacerbating the problem.[3]

One of these waste drums was #68660. Documents accompanying the drum from LANL to WIPP made no mention of the high acidity or the neutralizer, and they said that it contained an inorganic absorbent.[3]

The decision to take shortcuts was likely motivated by pressure to meet a deadline to remove waste from an area at LANL considered vulnerable to fire. Meeting the deadline would have helped LANL contractors' extend their lucrative contracts to package waste at LANL and transport it to WIPP.[3]

For two years preceding the February 2014 incident, LANL refused to allow inspectors conducting annual audits for the New Mexico Environment Department (NMED) inside the facility where waste was treated, saying the auditors did not have appropriate training to be around radioactive waste. The NMED did not insist on gaining access because, in the words of a departmental spokesperson, it was "working on higher priority duties at the time that mandated our attention."[3]

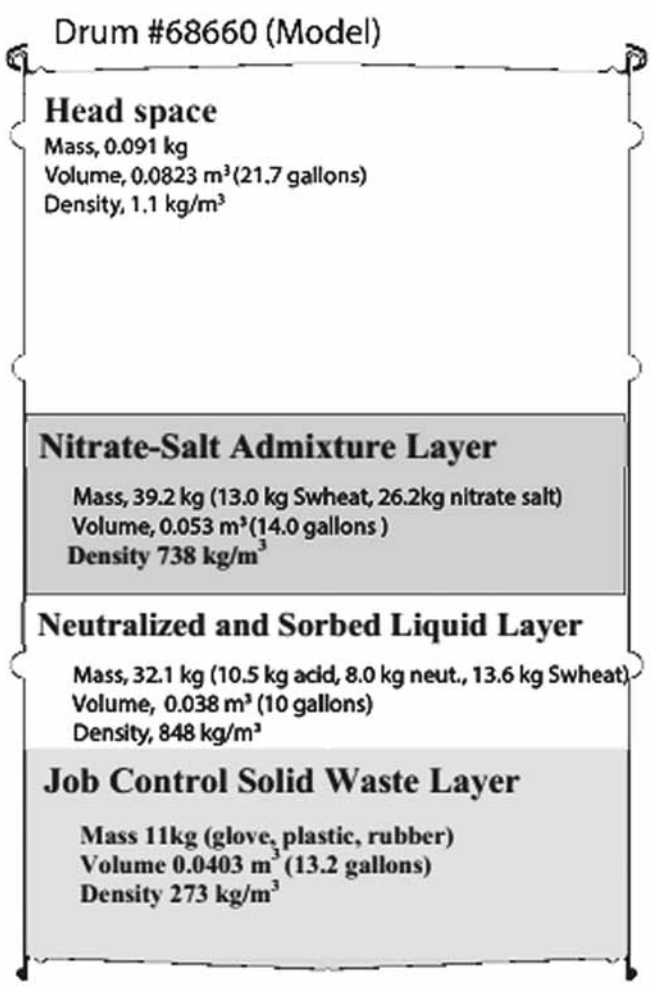
There were further lapses after the drum rupture. The *New Mexican* reported:

"Documents and internal emails show that even after the radiation leak, lab officials downplayed the dangers of the waste − even to the Carlsbad managers whose staff members were endangered by its presence − and withheld critical information from regulators and WIPP officials investigating the leak. Internal emails, harshly worded at times, convey a tone of exasperation with LANL from WIPP personnel, primarily employees of the Department of Energy and Nuclear Waste Partnership, the contractor that operates the repository."[3]

Several months after the rupture of drum #68660, an LANL chemist discovered that the contents of the drum matched those of a patented explosive. Personnel at WIPP were not informed of the potential for an explosive reaction for nearly another week − and they only learned about the problem after a DoE employee leaked a copy of the chemist's memo to a colleague in Carlsbad the night before a planned entry into the room that held the ruptured drum. That planned entry was cancelled. Workers in protective suits entered the underground area several days later to collect samples.[3]

"I am appalled that LANL didn't provide us this information," Dana Bryson from DoE's Carlsbad Field Office wrote in an email when she learned of the memo.[3]

The DoE employee who first alerted WIPP personnel to the threat was reprimanded by the DoE's Los Alamos Site Office for sharing the information.[3]



Contamination

Inevitably the clean-up has faced problems due to radioactive contamination in the underground panels and tunnels, and delays in routine underground maintenance because of the contamination. The Santa Fe *New Mexican* reported on some of these problems:

"In October, when a fan was tested for the first time since the accident, it kicked up low levels of radioactive materials that escaped from the mine. Waste drums that normally would have been permanently disposed of within days of their arrival at WIPP instead were housed in an above-ground holding area for months and leaked harmful but nonradioactive vapors that sickened four workers. A chunk of the cavern's ceiling crashed to the ground after the contamination delayed for months the routine bolting that would have stabilized the roof."[1]

Another problem is that workers are entering underground areas that are not being monitored for carcinogenic volatile organic compounds. Monitoring of these compounds, a condition of WIPP's permit from the state of New Mexico, has not been taking place since February 2014 because of limited access to contaminated underground areas.[5]

Don Hancock from the Southwest Research and Information Center said:

"They have no intention of starting to do the volatile organic compound monitoring in the underground at least until January of 2016. They fully intend to keep sending workers into the underground with no intention

of following this requirement. It's in violation of the permit, and the Environment Department should say so."[5]

Fines

The NMED has fined the DoE US$54 million (€49.2m). The Department identified 13 violations at WIPP, and imposed penalties of US$17.7 million (€16.1m). The Department identified 24 violations at LANL, and imposed penalties of US$36.6 million (€33.3m).[7] The DoE is appealing the fines.[8]

The DoE says that any state fines it pays for the WIPP accident will come from money appropriated to clean up nuclear weapons sites in New Mexico. A 2016 budget year summary presented in February by DoE's Office of Environmental Management says: "Any fines and penalties assessed on the EM [environmental management] program would be provided by cleanup dollars, resulting in reduced funding for cleanup activities."[8]

NMED Secretary Ryan Flynn responded:

"Essentially, DoE is threatening to punish states by doing less cleanup work if states attempt to hold it accountable for violating federal and state environmental laws. States like New Mexico welcome federal facilities into our communities with the understanding that these facilities will respect the health and safety of our citizens by complying with federal and state laws."[8]

The NMED is working on a new compliance order that could include fines of more than US$100 million (€91.1m). Flynn said:

"We've indicated all along that if DoE is willing to take accountability for the events that caused the release and work with the state then we'd be willing to release them from any further liability at Los Alamos and WIPP. If DoE is not willing to take accountability for what's occurred, then they are going to face significant additional penalties."[9]

A February 22 editorial in the *Albuquerque Journal* states:

"It would behoove the DoE to quit poisoning the well when it doesn't have another option for disposing of this kind of waste underground. ... So the DOE should start paying up and playing fair with the only game in town."[10]

Greg Mello from the Los Alamos Study Group said that an increase in weapons spending proposed by the Obama administration would pay "all the NMED-proposed fines a few times over."[8]

Clean-up costs

Costs associated with the February 2014 accident include clean-up costs, fines, and costs associated with managing the backlog of waste at other sites until it can be sent to WIPP. Total costs will be at least US$500 million (€455m).[1]

WIPP is unlikely to be fully operational until at least 2018 according to federal Energy Secretary Ernest Moniz. "We are targeting 2018 but I have to admit that that remains a little uncertain; the key project is the new ventilation system and that is still undergoing engineering analysis," Moniz said in February.

Don Hancock doubts that the 2018 timeline can be met. Salt mines exist across the world, he said, but reopening a contaminated salt mine following a radiological release is unprecedented and the government has no model to follow.[11]

Earl Potter, the former Westinghouse lawyer with a long association with WIPP, told the *New Mexican* that he doubted whether WIPP could continue if another radiation leak happened during the recovery process. "We can survive one," he said, "but two, I don't think so."[1]

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Australian Radioactive Exposure Tour

This year marks the 25th anniversary of the first Radioactive Exposure Tour (or 'radtour') run by Friends of the Earth in Australia. These tours have exposed thousands of people first-hand to the realities of 'radioactive racism' and to the environmental impacts of the nuclear industry.

This year's radtour will take place from June 27 to July 8. From blue coast to red desert, the radtour will visit two operating uranium mines, Australia's only reactor at Lucas Heights, the former proposed nuclear power site at Jervis Bay, hotspots of uranium exploration, the missile testing site associated with the British atomic bomb testing program in Australia, historical sites of resistance, Lake Eyre (a giant inland lake), Mound Springs fed by the underlying Great Artesian Basin, the gorges of the Flinders Ranges ... and much more!

International participation is welcome. Last year's radtour included participants from India, Japan, Vietnam, Indonesia, the UK, New Zealand and France.

www.radioactivetour.com

www.foe.org.au/radtour
radexposuretour@gmail.com

Walkatjurra Walkabout

Meanwhile, 'Walkatjurra Walkabout – Walking for Country' will take place in Western Australia from August 17 to September 18. The Walkabout, from Wiluna to Leonora, takes in proposed uranium mining sites and former uranium exploration sites. It will be led by the Walkatjurra Rangers, in partnership with Footprints for Peace, the WA Nuclear Free Alliance, and the Conservation Council of WA.

RADIOACTIVE EXPOSURE TOUR 2015

Aboriginal Traditional Owner Kado Muir says:

"The Walkatjurra Walkabout is a pilgrimage across Wangkatja country in the spirit of our ancestors so together, we as present custodians, can protect our land and our culture for future generations.

"My people have resisted destructive mining on our land and our sacred sites for generations. For over forty years we have fought to stop uranium mining at Yeelirrie, we stopped the removal of sacred stones from Weebo and for the last twenty years we have stopped destruction of 200 sites at Yakabindie. We are not opposed to responsible development, but cannot stand wanton destruction of our land, our culture, and our environment.

"We invite all people, from all places, to come together to walk with us, to send a clear message that we want the environment here, and our sacred places left alone."

http://walkingforcountry.com/

walk4country@gmail.com

WISE/NIRS Nuclear Monitor

The World Information Service on Energy (WISE) was founded in 1978 and is based in Amsterdam, the Netherlands.

The Nuclear Information & Resource Service (NIRS) was set up in the same year and is based in Washington D.C., US.

WISE and NIRS joined forces in the year 2000, creating a worldwide network of information and resource centers for citizens and environmental organizations concerned about nuclear power, radioactive waste, proliferation, uranium, and sustainable energy issues.

The WISE / NIRS Nuclear Monitor publishes information in English 20 times a year. The magazine can be obtained both on paper and as an email (pdf format) version. Old issues are (after 2 months) available through the WISE homepage: www.wiseinternational.org

Subscriptions:

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