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Editorial

Dear readers of the WISE/NIRS Nuclear Monitor,

In this issue of the Monitor, we have detailed articles on:

- the March 24–25 Nuclear Security Summit in the Netherlands, and protests targeting a side-event – the Nuclear Industry Summit;
- the problems associated with ageing nuclear reactors;
- the military and energy debates, regional and global, arising from the political crisis in Ukraine.

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



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Nuclear Security Summit

Author: Jim Green – Nuclear Monitor editor

The March 24–25 Nuclear Security Summit (NSS) in the Netherlands was attended by representatives from over 50 countries (notable absentees included Iran and North Korea). Previous Summits were held in the US in 2010 and South Korea in 2012, while the next (and possibly last) Summit will be held in the US in 2016.

The NSS issued a banal communiqué, most or all of which was decided in advance.¹ The closest the communiqué comes to substance – and it is not close at all – is to identify a range of “voluntary measures” which states “may consider taking” such as “publishing information about national laws, regulations and organisational structures; exchanging good practices; inviting IAEA review and advisory services and other reviews and following up on their conclusions; providing information through relevant existing reporting mechanisms and forums; further developing training of personnel involved in nuclear security by setting up and stimulating participation in training courses and applying domestic certification schemes.”

Elsewhere the communiqué is beyond parody: “Sharing good practices, without detriment to the protection of sensitive information, might also be beneficial.”

Thirty-five countries endorsed an additional, somewhat less vacuous statement saying they will incorporate IAEA nuclear security guidelines into national legislation, and host ‘peer reviews’ of national nuclear security policies and practices.² Notable non-signatories included China, India, Pakistan, and Russia.

Twenty-three states endorsed a statement (a “gift basket” in the jargon) concerning enhancing radiological security (notable non-signatories included Russia, India, Pakistan, and China).³ Only five states – Japan, France, South Korea, the UK and the USA – endorsed a statement on nuclear transport security risks. Harvard University’s Matthew Bunn said the transportation gift basket “is as weak as dishwasher,” and he took exception to its suggestion that “the security record of civilian transport of nuclear materials has been excellent”.⁴

To be fair, useful work is being done in some – perhaps many – countries to tighten nuclear security.⁵ But it’s too little and too slow, and the concept of nuclear security is too narrowly defined. The very first dot-point in the conference communiqué insists that “measures to strengthen nuclear security will not hamper the rights of States to develop and use nuclear energy for peaceful purposes”.

Victor Gilinsky, a former member of the US Nuclear Regulatory Commission, noted in 2009 that “even so-called arms controllers fall over themselves trying to establish their bona fides by supporting nuclear energy development and devising painless proposals ...”⁶ That mentality was in evidence at the NSS, just as it was at the IAEA nuclear security conference in Austria last July. Gilinsky advocates a reversal of priorities: “Security should come first – not as an afterthought. We should support as much nuclear power as is consistent with international security; not as much security as the spread of nuclear power will allow.”

Nuclear security architecture

The NSS website says that Summit participants “laid the basis for an efficient and sustainable nuclear security architecture, consisting of treaties, guidelines and international organisations.”⁷

But there was no discussion, and no outcomes, regarding vital architecture such as the flawed Nuclear Non-Proliferation Treaty. The security threats posed by nuclear weapons arsenals were beyond the scope of the NSS. As Greenpeace put it: “Nations like the US and Russia have stockpiles of nuclear weapons that could end the existence of mankind many times over. But these countries are apparently not a threat. Instead, they get applauded for initiating a world summit on nuclear terrorism. For future reference: if you are a nation, having nuclear bombs makes you powerful. If you are not, having nuclear bombs or even nuclear material makes you a potential terrorist. With exception to North-Korea and Iran, of course, who are regarded as terrorists either way.”⁸

The discussion on nuclear weapons was vacuous and focused on terrorists. US President Barack Obama’s ultra-lite contribution included a reworking of the old saying that a single nuclear bomb can ruin your whole day: “Just one nuclear weapon exploded in a city ... would badly destabilize our security, our economies, and our very way of life.”⁹

Nor did the NSS produce any outcomes regarding another vital piece of nuclear architecture: the flawed IAEA safeguards system. A report concerning safeguarding of nuclear fuel cycle facilities, released on March 18 by the Nuclear Proliferation Prevention Project at the University of Texas, concludes:

*“Theoretical solutions to improve IAEA safeguards have been discussed for decades. However, proprietary, economic, and sovereignty concerns have limited the extent to which countries and private companies have implemented these theoretical solutions. Even in states that cooperate with the IAEA and apply sophisticated accounting mechanisms, such as Japan, safeguards at fuel-cycle facilities currently cannot come close to achieving their explicit goal of providing timely warning of a suspected diversion of one bomb’s worth of fissile material. The prospects are even worse in states that resist cooperation and may wish to keep open their weapons option, such as Iran, and at facilities that employ first-generation safeguards.”*¹⁰

Yet the NSS did not even consider the safeguards system.

Good news stories

The removal of 234 kgs of highly-enriched uranium (HEU) from Ukraine in 2012 was promoted as a nuclear security success story at the NSS. The HEU removal was a “vivid reminder that the more of this material we can secure, the safer all of our countries will be” according to President Obama. “Had that not happened, those dangerous nuclear materials would still be there now. And the difficult situation we are dealing with in Ukraine today would involve yet another level of concern.”¹¹

But Ukraine’s 15 operating power reactors and spent fuel stores remain vulnerable to attacks. There are calls – if only from the political fringes – for Ukraine to use its civil nuclear infrastructure to develop nuclear weapons. And the Ukraine crisis has pitted nuclear-armed rivals against each other. In a worst-case scenario, Russia might invoke its self-proclaimed “right” to use nuclear weapons in response to large-scale conventional military attacks,¹² and the US/NATO might respond in kind.

Another good news story from the NSS was an announcement that Japan would send “hundreds of kilograms” of HEU and separated plutonium (most of it weapon-grade) from the Tokai Fast Critical Assembly to the US.¹³ No matter that a similar announcement had already been made in January.¹⁴

Meanwhile Japan continues to expand its stockpile of 44 tons of separated plutonium (nine tons in Japan, 35 tons at reprocessing plants in Europe) and it continues to advance plans to start up the Rokkasho reprocessing plant which would result in an additional eight tons of separated plutonium annually. With no hint of irony, the US/Japan joint statement announcing the plan to send HEU and separated plutonium from Tokai to the US concludes: “Our two countries encourage others to consider what they can do to further HEU and plutonium minimization.”¹⁵

There is a long history of lax nuclear security in Japan.¹⁶ The US has reportedly raised concerns about inadequate security at Rokkasho and other nuclear plants in Japan.¹⁷ In November 2013, Japan’s Nuclear Regulation Authority admonished the Japan Atomic Energy Agency for failing to take appropriate measures to protect its Monju prototype fast-breeder reactor from potential terrorist attacks.¹⁸

The numbers game

If you’ve followed any of the media coming out of the NSS, you may be familiar with this numerical sequence: 52, 38, 25. In 1991, 52 states possessed nuclear weapons-usable material – HEU or separated plutonium. By 2009, the number fell to 38, and in 2014 the number is 25 (and another five possessing less than 1 kg of weapons-usable material).¹⁹

But there’s no justification for any countries retaining weapons-usable material. Nuclear weapons states ought to disarm. There’s no justification for the production of weapons-usable material in the nuclear fuel cycle: in particular, there’s no justification for separating and stockpiling plutonium since precious little of the plutonium (or uranium) separated by reprocessing is used as reactor fuel and global stockpiles of separated plutonium continue to grow. Nor is there any justification for the use

of HEU for research reactor fuel or irradiation targets: HEU ought to be replaced with low-enriched uranium; or better still, research reactors ought to be replaced with technologies such as particle accelerators.

The halving of the number of countries holding weapons-usable material doesn't look so impressive when considering the volumes of material involved. According to the World Nuclear Association, a total of almost three tonnes of HEU and plutonium have been removed or disposed of from 27 countries.²⁰ That's pittance relative to global stockpiles of around 1,300 tonnes of HEU and around 450 tonnes of plutonium.

In addition, 24 research reactors in 14 countries have now been converted to run on low enriched uranium fuel rather than HEU.²¹ But over 120 research reactors around the world still use HEU for fuel or targets – many of them with “very modest security measures” according to a Harvard University report.²²

The halving of the number of countries holding weapons-usable material is very likely a net positive for nuclear security. But most or all of the countries divesting themselves of weapons-usable material have sent it to the US or Russia, and nuclear security is lacking in both countries.

USA and Russia

Nuclear security risk factors in Russia include political instability, ineffective governance, pervasive corruption, and the presence of groups determined to obtain nuclear materials.²³

A March 2014 report by Harvard University's Belfer Center for Science and International Affairs states: “Russia has dramatically improved nuclear security and accounting in the last two decades (with substantial US help). But Russia continues to have the world's largest nuclear stockpiles stored in the world's largest number of buildings and bunkers, and sophisticated adversaries could exploit remaining security weaknesses – especially vulnerability to insider theft. Underfunding raises serious questions about whether effective nuclear security and accounting systems will be sustained. Continued US-Russian nuclear security cooperation is needed, but the crisis in Ukraine is likely to make such cooperation more difficult.”²⁴

In a 2011 report, the US Director of National Intelligence discussed nuclear smuggling in Russia: “We assess that undetected smuggling of weapons-usable nuclear material has occurred, but we do not know the total amount of material that has been diverted or stolen since the dissolution of the Soviet Union. We judge it highly unlikely that Russian authorities have been able to recover all of the stolen material.”²⁵

Nuclear security lapses in the USA over the past year include:

- Maj. Gen. Michael Carey was dismissed from his position as commander of the 20th Air Force, which maintains and operates intercontinental ballistic missiles, for drunken antics during an official trip to Moscow in 2013.²⁶
- In May 2013, the Air Force disclosed that it had removed 17 officers assigned to guard nuclear-armed

missiles after finding safety violations, potential violations in protecting codes and attitude problems.²⁷

- In May 2013 it was reported that Air Force officers with nuclear launch authority were twice caught napping with the blast door open.²⁸
- A 2013 inspection by the Department of Energy's Inspector General found that Los Alamos National Laboratory failed to meet its goal of 99% accuracy in accounting for the lab's inventory of weapons-grade nuclear materials, including plutonium.²⁹
- An August 2013 report by LBJ School of Public Affairs at Texas University detailed inadequate protection of US commercial and research nuclear facilities.³⁰
- In January 2014 it was reported that an Air Force probe into illegal drug use had expanded to include 10 US officers at a UK airbase and five officers in the US.³¹
- At least 82 missile launch officers from an Air Force base in Montana face disciplinary action for cheating on monthly proficiency tests or for being aware of cheating and failing to report it. Another nine officers are being handled separately by the Air Force Office of Special Investigation; eight of those nine involve possible criminal charges stemming from the alleged mishandling of classified information. In addition, nine officers in leadership positions have been reassigned for failing to provide adequate oversight of their crew force; and Air Force Col. Robert Stanley, who oversees the missile crew, resigned.³² Former missile-launch control officer Bruce Blair said cheating “has been extensive and pervasive at all the missile bases going back for decades.”³³
- Missile launch officers in two different incidents were found to have violated security regulations designed to prevent intruders from seizing their ICBM-firing keys.³⁴
- In March 2013, airmen responsible for missile operations at Minot Air Force Base, North Dakota, passed an inspection with a ‘marginal’ rating, and even that was only because of good marks received by support staff like cooks and facilities managers. Missileers on their own would have flunked. Nineteen officers were forced to surrender their launch authority because of performance and attitude problems.³⁵
- In February 2014, the Navy announced it had opened an investigation into accusations of widespread cheating by sailors at an atomic-reactor training school in South Carolina.³⁶
- In March 2014, a congressionally mandated panel said a key Energy Department agency has “failed” in its mission to effectively oversee US nuclear weapons operations. Drastic reforms are crucial to address “systemic” management shortcomings at the National Nuclear Security Administration, according to preliminary findings unveiled by the co-chairs of the Advisory Panel on the Governance of the Nuclear Security Enterprise.³⁷
- In March 2014 it was reported that former military contractor Benjamin Bishop would plead guilty to providing nuclear-arms secrets and other classified information to his Chinese girlfriend.³⁸

The March 2014 report by Harvard University's Belfer Center for Science and International Affairs detailed significant nuclear security gaps in the US and other countries.³⁹ And many more US nuclear security lapses were reported in the *Nuclear Monitor* last year.⁴⁰

The United States' credibility is also undermined by its failure to ratify the 2005 amendment to the Convention on the Physical Protection of Nuclear Materials and the

International Convention on the Suppression of Acts of Nuclear Terrorism.⁴¹ Moreover federal government budget requests and allocations for nuclear security have been reduced repeatedly since 2011, with programs such as the Global Threat Reduction Initiative, the International Material Protection and Cooperation program, Securing the Cities, and a program to replace HEU research reactor fuel with low-enriched uranium, suffering.⁴²

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Actions against Nuclear Industry Summit

Author: Peer de Rijk, Director of WISE international

The Netherlands got flooded and overwhelmed by the biggest event the country has ever organised – the Nuclear Security Summit at The Hague. A large part of the country was sealed off, thousands of people working in the ministries were forced to take two days off as they would have not been able to reach their offices anyway, and 13,000 police (out of the 60,000 we have) were sent out to the streets.

Anti-nuclear groups were all visited by (secret) police in the weeks before the Nuclear Security Summit. The World Information Service on Energy (WISE) decided not to focus on the Nuclear Security Summit itself; the agenda was vague anyway and it was totally impossible to influence what was going on. NGOs were quite reluctant to take action; the whole atmosphere was as if the country was preparing for war instead of an international gathering of people. There were some small demonstrations before and during the Security Summit.

WISE decided to focus on the propaganda machine that was deployed by the 'civil' nuclear industry at the same time as the Nuclear Security Summit – the Nuclear Industry Summit (NIS) taking place in Amsterdam, where security measures were more relaxed.

The NIS was organised by URENCO, the German-British-Dutch enrichment company that enriches uranium for at least 170 nuclear power stations in 18 countries. Two hundred industry spivs gathered to promote nuclear energy as "safe, clean and affordable". The Dutch Minister of Economic Affairs supported the lobbying event with an opening speech. As we were not allowed to participate and debate with the industry delegations, we decided to take action and go out on the streets. Together with other Dutch organisations, gathered under the umbrella of the 'Dutch National Platform Against Nuclear Power' (LPTK), around 40 people protested the pro-nuclear lobby meeting.



Protest outside the Nuclear Industry Summit, Amsterdam.

The NIS participants were confronted with anger and disapproval and clearly were not happy that URENCO and the City Council of Amsterdam did not prevent this confrontation. The activists stayed for three hours, building a big wall (22 x 3 metres) of boxes with a clear message: "nuclear blocks sustainability".

The next day the NIS participants split into four groups, each visiting nuclear hot-spots in the Netherlands – the national interim waste storage COVRA in the south, the research reactor in Delft, the URENCO enrichment plant in Almelo, and the research reactor in Petten. Just a few days before the two Summits began, the US government criticised the Dutch for not complying with agreements about converting the Petten isotope production reactor from highly-enriched uranium to low enriched uranium. This was meant to happen in 2015 at the latest, but Petten has stated that this deadline will not be met.

In Almelo and in Petten, NIS participants were again confronted with activists. In Almelo a group of 10 people stood at the gates with banners. In Petten, 35 activists tried to block the buses carrying international nuclear industry representatives, but were blocked by police.

Nuclear reactors are getting old – and it's showing

Author: Michael Mariotte

Michael Mariotte is President of the US Nuclear Information & Resource Service

The ageing of nuclear reactors is a topic that is receiving renewed attention, and for good reason. Last year, in the US alone, technical problems faced by older reactors closed two reactors at San Onofre, California and one at Crystal River. Recently we learned that the two reactors at St. Lucie, Florida may now face similar issues, while the owners of the decrepit Davis-Besse reactor in Ohio have optimistically launched a US\$600 million (€433m) effort to replace steam generators there (steam generators were the fundamental problem at all of these other reactors).

Economic problems – the inability for ageing reactors to compete with lower cost electricity sources, partly because of the large costs associated with maintaining them (after all, as the industry constantly touts, their uranium fuel source is cheaper than fossil fuels), led to the shutdown of the Kewaunee reactor in Wisconsin and the pending shutdown of Vermont Yankee. Several other reactors, mostly in the Northeast and Midwest, are believed to be close to permanent shutdown because of their lack of economic competitiveness.

Like all man-made machines, nuclear reactors get old. Just like your lawnmower, refrigerator, car have to be repaired and eventually replaced, just like factories need to be modernised or just as often razed and rebuilt, so too do nuclear reactors. One difference is that in nuclear reactors, which are required to use much higher quality components than a household appliance or automobile, replacement of major systems can be extraordinarily expensive. The other difference, of course, is that unlike virtually any other man-made machine, failure of an ageing reactor system can lead to catastrophe.

The Nuclear Information & Resource Service published its first major report on ageing reactors about 20 years ago – even then it was clear that licenses from the Nuclear Regulatory Commission (NRC) to operate are simply pieces of paper. The real roadblocks to extended operations would be the cost of maintenance, major repairs, and modernisation. Since then, most US reactors have received those pieces of paper that extend their operational lifetimes to 60 years from 40 years, although the NRC is expecting applications from some utilities to re-extend their licenses to allow an 80-year lifetime – although no reactor in the world has yet reached 60 years. Again, it's a legal document – a piece of paper, not an assurance that a man-made machine can overcome the inevitable costs of ageing-related repairs and obsolescence.

Greenpeace report

With that in mind, Greenpeace International recently published a major report – *Lifetime extension of ageing*

*nuclear power plants: Entering a new era of risk*¹ – and unveiled a new website on the risks of ageing nuclear reactors in Europe (<http://out-of-age.eu>). The report includes chapters from the German Öko-Institut (investigating the technical aspects of nuclear ageing), Prof. Stephen Thomas of the University of Greenwich (assessing the role of economics in decisions on the lifetime extension of old nuclear reactors), Prof. Tom Vanden Borre of the University of Leuven in Belgium and Prof. Michael Faure from the University of Maastricht (assessing the implications of an ageing reactor fleet for nuclear liability) and Jan Haverkamp (assessing the public's role in decisions to extend the lifetimes).

The report notes that 25 out of 151 reactors in Europe (excluding Russia) are over 35 years old; 67 (44%) are over 30 years old; and 46 out of 151 are older than their original design lifetimes or within three years of reaching that date. The average age of reactors across Europe is 29 years, while a typical design lifetime is 30 or 40 years.

In an accompanying commentary, veteran Greenpeace and NIRS/WISE activist Jan Haverkamp argues that attempting to extend the lifetimes of European reactors “would be a multiple mistake for the European Union.”² It would put citizens into a new era of risk, and spending the money to upgrade reactors to meet modern requirements (which in France, for example, is estimated at 4 billion Euros per reactor) “would be a waste of money” that would be better used to ensure that alternative energy sources are there when the reactors close.

Concludes Haverkamp: “The European leaders will discuss our energy future not too far after the third anniversary of the Fukushima catastrophe. If they don't shed the shackles to their big energy companies, we will be facing more Fukushimas with our ageing nuclear fleet. The last thing you want if you face a climate crisis as we do now, is being tied in by a nuclear accident. It's time to set the switches right: 55% greenhouse gas reductions in 2030, a binding minimum of 45% renewables and 40% efficiency increase. Nuclear power can't help to deliver these targets.”

Union of Concerned Scientists

In the US, Dave Lochbaum of Union of Concerned Scientists has also raised the ageing issue recently.³ Lochbaum examines an October 2013 report from the NRC's independent Office of Inspector General (OIG) audit of the NRC's oversight of active component ageing.⁴

The OIG audit concluded: “The NRC's approach for oversight of licensee's management of active component ageing is not focused or coordinated.

This has occurred because NRC has not conducted a systematic evaluation of program needs for overseeing licensees' ageing management for active components since the establishment of the Reactor Oversight Process (ROP) in 2000, and does not have mechanisms for systematic and continual monitoring, collecting, and trending of age-related data for active components. Consequently, NRC cannot be fully assured that it is effectively overseeing licensees' management of ageing active components."

The NRC staff replied to a draft version of the OIG audit and the OIG then responded – very critically – to eleven separate NRC replies. Lochbaum looked at each reply and response and concluded the final score was OIG 11, NRC 0.

Lochbaum's final thoughts are well worth keeping in mind, especially by those in the areas populated by ageing US reactors (which, of course, is nearly all US reactors):

"The blog's title of "This is Getting Old" applies to both safety components at nuclear power plants and to the NRC's tired denials. The reason the NRC's Operating Experience Branch reviewed five years of data was to ascertain what is working well and where improvements might be warranted. The report it produced well served that purpose. OIG's audit had a similar objective in determining where the NRC is doing well and where improvements are warranted. The audit report it produced fully met that objective.

"Collectively, these reports constitute an action plan identifying which practices should be sustained and those practices to be supplemented or strengthened. But instead of viewing the reports as roadmaps showing timely mid-course corrections, NRC's senior management responded by essentially denying that the eleven problems even exist. In a sad sense, they are quite right – it's not that eleven problems exist. Their denial of the problems makes for an even dozen – the eleven problems joined by the stubborn refusal to authorize the improvements so clearly identified and badly needed. The first step in any 12-step program involves admitting there's a problem to be solved. NRC's senior managers should stop their two-step pretending that no problems exist and start on the path to solutions."

Lochbaum also points to a February 2013 NRC report.⁵ Among the NRC's key findings:

- "Since 2009, there is a notable increase in the number of inspection findings and LERs [licensee event reports] involving highly reliable components whose failure was attributed to age degradation after being in service for over 15 years."



Climbers from Greenpeace Belgium hang a banner with the slogan "The End" from a cooling tower during a protest at the Tihange power plant in Belgium, March 5.

Photo by Nick Hannes / Greenpeace

- "It is interesting to note that in more than 75 percent of the 105 datum that were reviewed, it was determined that the System, Structure, or Component (SSC) either exceeded its recommended service life or was effectively run-to-failure. Thus, it is reasonable to question the oversight effectiveness of the baseline inspection program in this area."
- "[W]ith greater than two-thirds of findings and events involving SSCs left in service well beyond expected service life, it is reasonable to question why NRC oversight programs are not more focused on aging management of active SSCs."

In Lochbaum's words: "Thus, the NRC's report identified the inability of plant owners to prevent age-related failures coupled with the NRC's inability to adequately enforce the regulatory requirements being violated."

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Greenpeace protests at ageing nuclear plants

240 Greenpeace activists broke into the grounds of ageing nuclear plants in six European countries on March 5, and 76 were arrested. The nuclear plants were Beznau in Switzerland, Bugey and Gravelines in France, Oskarshamn in Sweden, Tihange in Belgium, Garoña in Spain and Borssele in the Netherlands.

About 100 activists entered the Beznau plant in Switzerland. Some climbed the superstructure of the reactor and hung banners demanding the immediate shut-down of the 45 year old power plant while a paraglider circled the sky, also displaying a banner.

In Sweden, 20 activists used ladders to scale the fence around the Oskarshamn plant, and four of them then climbed to the top of one of the plant's three reactor buildings and unfurled a massive banner in the shape of a "pension notification letter". All the activists were subsequently apprehended by security guards and police. Sweden has four of the ten oldest reactors in Europe.

In Belgium, 80 activists entered the grounds of the Tihange reactor, projected the words "The End" onto one of the chimneys, and staged a 'decommissioning' of the Tihange reactor in Belgium. Ten climbers unfolded banners between the chimneys of the reactors while activists also placed a large nuclear barrel and smaller barrels at the main entrance.

Protesters in Borssele in the southern Netherlands used a film projector to display an animation of stress cracks and crumbling onto a reactor.

In France, EDF reported that 18 people were arrested by police before they managed to get through the fence surrounding the Gravelines plant – but Greenpeace said activists crossed three security barriers and were approaching reactor #6 when they were apprehended. Also in France, a 'decommissioning team' symbolically blocked the entrance to the Bugey station and started to 'decommission' the plant by taking down signs.

In Spain, 30 activists started to 'decommission' the Garoña nuclear power plant. Protestors chained themselves to the gates and unfolded banners as workers from the plant sprayed them with water cannons.

Greenpeace blog and video of the March 5 protests:

www.greenpeace.org/international/en/news/Blogs/nuclear-reaction/ageing-nuclear-reactors/blog/48405/

www.youtube.com/watch?v=qKbw-0FEv-0

Photos:

http://photo.greenpeace.org/C.aspx?VP3=ViewBox_VPage&ALID=27MZIF3SDPFM&CT=Album

www.flickr.com/photos/greenpeaceinternational/sets/72157641894482415/

www.flickr.com/photos/27785378@N06/sets/72157641891087055/

Are new reactors the answer to old reactors?

Benjamin Sovacool and Christopher Cooper noted in a 2008 journal article¹:

"Nuclear engineer David Lochbaum has noted that almost all serious nuclear accidents occurred with recent technology, making newer systems the riskiest. In 1959, the Sodium Research Experiment reactor in California experienced a partial meltdown fourteen months after opening. In 1961, the SI-1 Reactor in Idaho was slightly more than two years old before a fatal accident killed everyone at the site. The Fermi Unit 1 reactor began commercial operation in August 1966, but had a partial meltdown only two months after opening. The St. Laurent des Eaux A1 Reactor in France started in June 1969, but an online refueling machine malfunctioned and melted 400 pounds of fuel four months later.

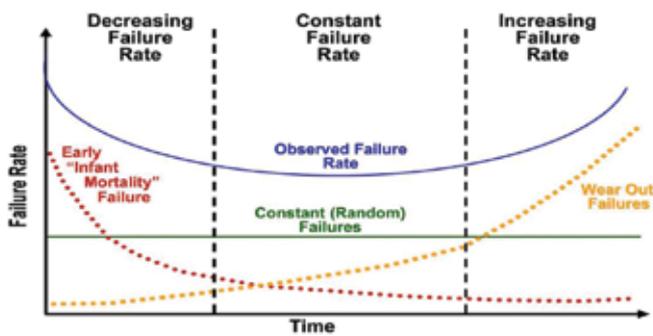
"The Browns Ferry Unit 1 reactor in Alabama began commercial operation in August 1974 but experienced a fire severely damaging control equipment six months later. Three Mile Island Unit 2 began commercial operation in December 1978 but had a partial meltdown three months after it started. Chernobyl Unit 4 started up in August 1984, and suffered the worst nuclear disaster in history on April 26, 1986 before the two-year anniversary of its operation."

What about Generation 4 reactors? These are indeed completely safe ... because they don't exist. A nuclear industry insider has quipped: "We know that the paper-moderated, ink-cooled reactor is the safest of all. All kinds of unexpected problems may occur after a project has been launched."²

Hirsch et al state: "A closer look at the technical concepts shows that many safety problems are still completely unresolved. Safety improvements in one respect sometimes create new safety problems. And even the Generation IV strategists themselves do not expect significant improvements regarding proliferation resistance. But even real technical improvements that might be feasible in principle are only implemented if their costs are not too high. There is an enormous discrepancy between the catch-words used to describe Generation IV for the media, politicians and the public, and the actual basic driving force behind the initiative, which is economic competitiveness."²

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The 'bathtub' nuclear risk curve.

IAEA acknowledges safety challenge of ageing reactors

The International Atomic Energy Agency's 2012 annual Nuclear Safety Review said: "There are growing expectations that older nuclear reactors should meet enhanced safety objectives, closer to that of recent or future reactor designs." It further noted that "there is a concern about the ability of the ageing nuclear fleet to fulfill these expectations" and that this "could impact safety and their ability to meet member states' energy requirements in an economical and efficient manner". Operators and regulators "must thoroughly analyze the safety aspects related to the ageing of 'irreplaceable' key components", it added.

Fredrik Dahl, 14 March 2012, 'Older Nuclear Plants Pose Safety Challenge: IAEA',

<http://planetark.org/enviro-news/item/64926>

Ukraine updates – military and energy debates

Nuclear weapons and militarism

US President Barack Obama used a March 26 speech to call for a stronger NATO military presence in central and eastern Europe.¹ NATO Secretary General Anders Fogh Rasmussen said in a March 19 speech that he would "continue to remind European nations that they need to step up politically and militarily, to hold the line on defense cuts, to increase their defense spending and to work together to fill key capability gaps, including missile defense."²

At its last summit in 2012, NATO reaffirmed that nuclear arms were a key tool. Rasmussen said on March 19: "Of course I cannot exclude that the events we have witnessed in Crimea will also have an impact on the thinking about arms control, including nuclear policies."³

George Perkovich from the Carnegie Endowment for International Peace said: "The debate over withdrawing nuclear weapons from European NATO air bases is over for the foreseeable future. This will pose some dilemmas for the Dutch, Belgians, Germans and others who have parties that want them out."⁴

In December, Russia said it had deployed nuclear-capable short-range Iskander missiles into its western military districts, bordering NATO states. Putin said it was a reaction to the development of a Europe-based anti-ballistic missile system, which Washington says is intended as a shield against a potential Iranian threat.⁵

The Polish government said on March 20 that it would speed up the process for choosing a national antimissile system. A Polish-US joint statement "confirmed that plans are on track to deploy a missile defense site in Poland in the 2018 timeframe as part of the European Phased Adaptive Approach to NATO missile defense." Washington also praised Warsaw's plans to increase military spending – something the US and NATO have been urging all European alliance partners to do.⁶

Global Security Newswire reported on March 27 that in response to events in Ukraine, Washington is halting talks with Moscow that were aimed at improving understanding and cooperation around missile defense. The bilateral talks had not seen much traction in recent years, even before Russia's incursion in Ukraine and annexation of Crimea put them into a deep-freeze. The discussions were aimed at assuaging the Kremlin's concern that US missile interceptors planned for fielding in the coming years in Romania and Poland were no threat to Russia's long-range nuclear arsenal.⁷

UK Conservative MP Julian Lewis argues that the Ukraine crisis justifies plans to upgrade Britain's nuclear weapons arsenal. He raised the prospect of Russia threatening one of the Baltic NATO states. Britain needs a nuclear arsenal, he said, with one Trident submarine continuously at sea as an "insurance policy against the unknown".⁸

In the US, the Ukraine crisis will be used to promote plans for nuclear weapons upgrades. The Navy will seek special appropriations to begin building a dozen new ballistic-missile submarines in the next decade. The Air Force wants to keep a secret "long-range strike bomber" on track and to progress plans to maintain its silo-based Minuteman missiles beyond 2030.⁹

The Ukraine crisis has disrupted global initiatives aimed at preventing the spread of weapons of mass destruction and fissile material under the auspices of the G8. The western boycott of the G8 meeting in Sochi means that cooperation on the partnership has been suspended.¹⁰

Speaking at the March 24–25 Nuclear Security Summit in the Netherlands, UN Secretary General Ban Ki-moon said: "Commitments to undertake disarmament negotiations in good faith must be honoured. So, too, must security assurances provided to non-nuclear-weapon States by nuclear-weapon States.

In the case of Ukraine, security assurances were an essential condition for its accession to the Nuclear Non-Proliferation Treaty. However, the credibility of the assurances given to Ukraine in the Budapest Memorandum of 1994 has been seriously undermined by recent events. The implications are profound, both for regional security and the integrity of the nuclear non-proliferation regime.”¹¹

Protection of nuclear plants in Ukraine

Andrii Deshchytzia, Ukraine’s acting foreign affairs minister, warned on March 25 of a “potential threat to many nuclear facilities and other critical infrastructure on the territory of Ukraine, including in Crimea. There is no immediate danger. However, if the situation aggravates Ukraine [we] may be in need of international assistance to protect these facilities.”¹²

Russia responded by accusing Ukraine of attempting to “pass the buck” for potential nuclear security lapses. “It is only the incapable [Ukrainian interim government] that can pose a threat to the Ukrainian nuclear facilities,” the Russian Foreign Ministry said. The ministry noted that Russia continues supplying fuel to Ukrainian power reactors and accepting spent nuclear fuel from Ukraine.¹³

Calls from far-right Ukrainian politicians for Kiev to develop nuclear weapons are being amplified in Moscow, and marginal views are being conflated with broader political opinion. Referring to calls by some Ukrainian politicians to pull out of the Nuclear Nonproliferation Treaty, the Russian Foreign Ministry said: “Attempts [by Deshchytzia] to distance himself from this position are not credible from our standpoint. It is lamentable that other depositories of the treaty pretend not to see this danger.”¹⁴

We noted in the last issue of *Nuclear Monitor* that IAEA safeguards inspections have been suspended or deferred in a number of countries over the decades as a result of domestic or international political turmoil or military conflict, and that there is no information on the IAEA website as to whether any safeguards inspections have been carried out in Ukraine in recent months, or whether any planned inspections have been deferred. In response to a query from *Nuclear Monitor*, the IAEA has refused to provide any information on safeguards inspections in Ukraine, stating that “for reasons of confidentiality we can’t get into details of safeguards inspections at individual facilities.”

Nuclear power

The potential for Russia to build nuclear reactors in the UK may be in jeopardy. Rosatom and the UK’s Department of Energy and Climate Change signed a memorandum of understanding in September 2013 that allowed Rosatom access to the UK nuclear market. The memorandum included access to the government’s Office for Nuclear Regulation and the Environment Agency so Rosatom could understand regulatory and licensing requirements. UK Energy Minister Michael Fallon recently said the agreement is “now under consideration in the light of recent developments.”¹⁵

Rosatom head Sergei Kiriyenko said that nuclear contracts with other countries could be affected by

Western sanctions. “Considering an array of comments about possible restrictions on economic cooperation, we understand that some of our contracts could fall under political curbs,” he said. But he added that no contracts had been affected so far and all deals, including for supplies of nuclear fuel to Ukraine for plants there, were being implemented on schedule.¹⁶

Reuters reports that nuclear interests in the US and western Europe hope that central and eastern European countries will develop nuclear power as an alternative to Russian gas. “I think it is wise for eastern Europe to be evaluating nuclear, because it forces them to be less dependent on external forces, external politics,” said Donald Hoffman, president of the American Nuclear Society. His comments were echoed by Christophe Behar from the French nuclear research centre CEA. But others are more sceptical. “The gas issue is very short-term, I don’t see how the nuclear industry could help,” said Jean Van Vyve from Belgium’s Electrabel, owned by GDF Suez. And Danes Burket, from Czech utility CEZ, does not expect a major boost for nuclear power either.¹⁷

Michael Mariotte from the US Nuclear Information and Resource Service argues that nuclear expansion in eastern Europe as a response to the Ukraine crisis “is far-fetched because new nuclear power would be far too slow to make any difference to the region’s energy picture for the next decade at least, and nuclear power would do little to solve the region’s, especially Ukraine’s, reliance on Russian natural gas, which is used primarily for heating, not electricity generation.”¹⁸

The US Beyond Nuclear NGO argues: “Russia’s annexation of Crimea from Ukraine has reignited bellicose threats of nuclear war and the shocking global consequences that could arise out of regional conflicts. It has further underscored the inherent threat and vulnerability from atomic power not only from the reality of catastrophic accidents but as pre-deployed retaliatory weapons for mass destruction that could be targeted in conventional war. As world tensions mount, more effort must now be directed on the need to abandon both nuclear weapons and nuclear power for planetary survival. ... Nuclear power plants are not only identified as vital infrastructure that could be targeted in a conventional war to cripple that nation’s electricity production but radiological weapons that for widespread land and resource contamination that will disregard borders.”¹⁹

Fossil fuels and renewable energy

Ukraine must keep close ties with Europe to prevent Russia using energy as a “new nuclear weapon”, interim Prime Minister Arseniy Yatsenyuk said. He wants the EU to provide Ukraine with natural gas to counter likely increases in the cost of supplies from Russia.²⁰

The Ukraine crisis is being used as an argument to boost shale gas development in the US. But as David Lowry notes, the shale gas revolution in America has peaked, and costs are rising rapidly to extract remaining reserves.²¹ Members of the US Congress are calling for the US to export liquefied natural gas to Europe. But Kiley Kroh from Think Progress argues that LNG exports would be costly, time-consuming,

environmentally risky and, in the end, unlikely to have a significant impact on Russia.²²

Richard Heinberg notes in a Post Carbon Institute article that there is just “one tiny problem” with plans to export more US oil and gas: on a net basis, the US has no oil or gas to export. “Perhaps America should instead consider exporting stupidity,” Heinberg writes. “It’s a commodity we seem to have in surplus.”

A media release from European Renewable Energy Associations states: “The growing uncertainties over the crisis in Ukraine show once again all the limits of Europe’s energy dependency. ... Decarbonising our energy sector should not be regarded as a burden, but rather as an opportunity for Europe’s industrial renaissance. Clear pledges on renewables for heating

and cooling and energy efficiency will increase EU’s energy independence, while improving our balance of trade, creating a substantial amount of new local jobs and ensure stable and affordable energy prices to our consumers and industries.”²³

Likewise, an *Energy Post* article states: “Policymakers in the US, UK and elsewhere are increasingly receptive to the idea that they should be pursuing unconventional oil and gas and nuclear power in the name of “energy security”. But ... such a strategy misses an essential point of economic history: relying on commodities retrieved by drilling and mining leads only to stagnation, rising costs and environmental damage. The way to growth, innovation and sustainability lies through manufacturing. In the field of energy this means: to renewable energy systems.”²⁴

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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

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