

# NUCLEAR MONITOR

September 18, 2014 | No. 791

A PUBLICATION OF WORLD INFORMATION SERVICE ON ENERGY (WISE)  
AND THE NUCLEAR INFORMATION & RESOURCE SERVICE (NIRS)



## Editorial

Dear readers of the WISE/NIRS Nuclear Monitor,

In this issue of the Monitor, we cover:

- A BBC beat-up regarding Friends of the Earth UK's position on nuclear power.
- The interconnections between Saudi Arabia's nuclear power program and its weapons ambitions.
- Updates from Japan – in particular, the long-delayed Japan-India Nuclear Cooperation Agreement, and reactor restart debates.

The Nuclear News section has reports on the efforts of industry and industry front-groups to stem the decline of nuclear power in the US; the slow death of 'small modular reactors'; India's new uranium enrichment plant; depleted uranium; the clean-up of a uranium mill in Saskatchewan, Canada; and much more!

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](mailto:monitor@wiseinternational.org)

## Friends of the Earth UK's position on nuclear power

**Authors:** *Jim Green (Nuclear Monitor editor; national nuclear campaigner – Friends of the Earth Australia) and Peer de Rijk (WISE Amsterdam)*

**NM791.4413** Recent media reports have claimed that Friends of the Earth UK (FoE-UK) has changed its position on nuclear power. The reports followed a September 10 BBC interview with FoE-UK's campaigns director Craig Bennett.<sup>1</sup>

The BBC's Roger Harrabin reported: "Today a [FoE-UK] spokesman revealed the group's new stance – it's no longer against nuclear power in principle although it still opposes new nuclear power stations because they're

## Monitored this issue:

- |  |   |
|--|---|
| <b>Friends of the Earth UK's position on nuclear power</b> – Jim Green and Peer de Rijk                    | 1 |
| <b>Saudi Arabia's nuclear power program and its weapons ambitions</b> – Jim Green – Nuclear Monitor editor | 3 |
| <b>Fukushima Fallout: Updates from Japan</b>   | 7 |
| <b>Nuclear News:</b>   | 8 |
| – Killing the competition: US nuclear front groups exposed   |   |
| – Oldest Indian reactor will not restart   |   |
| – Czech Republic: March against uranium in Brzkov  |   |
| – What went wrong with small modular reactors?   |   |
| – India's new uranium enrichment plant in Karnataka  |   |
| – Iran planning two more nuclear power reactors.   |   |
| – Depleted uranium as a carcinogen and genotoxin   |   |
| – Clean-up of former Saskatchewan uranium mill   |   |
| – France: Greenpeace activists given suspended sentences   |   |
| – USA: Missouri fire may be moving closer to radioactive waste   |   |
| – Britain's nuclear clean-up cost explosion  |   |

too expensive and, intriguingly, take too long to build." Harrabin called it "a huge and controversial shift."<sup>2</sup>

Bennett said on the BBC: "The biggest risk of nuclear power is that it takes far too long to build, it's far too costly, and distorts the national grid by creating an old model of centralised power generation." Asked about the "risks from radiation", Bennett responded: "Of course, there are real concerns about radiation, particularly around nuclear waste... but I think it is

important how this debate has shifted down the years. The real concern now is how we get on fast with de-carbonising our electricity supply. It's very clear that nuclear can't deliver big changes fast. That's a huge risk if we're trying to tackle climate change. With renewable technologies and with energy efficiency we could be making a difference within three or four years."<sup>1,3</sup>

The BBC's claims were in large part a beat-up. Bennett said FoE-UK had always deployed a suite of arguments against nuclear power, with the emphasis shifting over time.<sup>3</sup> Big deal.

The BBC and some other contributors to the debate juxtaposed 'in principle' or 'ideological' opposition to nuclear power with 'evidence based' or 'pragmatic' or 'functional' opposition, with the implication that in-principle or ideological opposition is evidence-free. It's not clear how or why anyone could or should oppose nuclear power without supporting evidence.

FoE-UK executive director Andy Atkins responded with a press release: "Friends of the Earth has not changed its position on nuclear power. We remain firmly opposed to it and continue to strongly promote a transition to an energy system based on energy efficiency and our abundant resource of renewable energy, which is getting cheaper to exploit by the day."<sup>4</sup>

Academic Dr David Toke said: "Today's BBC4 report that Friends of the Earth has become pro-nuclear has been quickly denounced by FOE themselves. But this reflects a growing recent trend to target green groups to get them at least to be neutral on the subject of investments or new research into nuclear power if not outrightly pro-nuclear. The Green Party of England and Wales was the target of a well prepared effort to shift their position last Saturday [September 6], although of course the pro-nuclear amendment to the Party's policy was rejected by an overwhelming majority."<sup>5</sup>

The BBC's beat-up regarding FoE-UK is not the first time an environment group's position on nuclear power has been misrepresented. For example in 2009–10 the World Nuclear Association heavily promoted a dishonest article claiming that Greenpeace UK had changed its stance on nuclear power.<sup>6</sup>

Notwithstanding the BBC's beat-up, it should be said that FoE-UK does not have an active anti-nuclear campaign (although some local groups may campaign on nuclear issues). Moreover, the organisation's position on nuclear power could be considered half-pregnant

– opposing new nuclear power reactors but not calling for the closure of existing reactors. Thus FoE-UK (presumably) favours a transition to a nuclear-free UK over a period of several decades as operating reactors are gradually closed.

Bennett later said: "Our position has now been "refreshed". We don't want to close down the UK nuclear industry right away – that would create far too many problems for energy supply over coming decades. But we still very much oppose nuclear new-build. The biggest issue is cost."<sup>3</sup>

In response to a query from the World Information Service on Energy, FoE-UK said: "With regard to existing nuclear power stations, we oppose the provision of subsidies to the industry, as it is a mature technology that has already received decades of subsidy. Subsidies should be used to support the development of new technologies, not to prop up old technologies. However, we do not call for the premature closure of existing nuclear power plants. Friends of the Earth has done its own modelling using a model developed by the Department of Energy and Climate Change (DECC), the 2050 Pathways calculator. This shows that Britain can meet its greenhouse gas emissions target and the 2030 decarbonisation goal recommended by the Committee on Climate Change without building new nuclear plants, as well as deliver high levels of energy security."

Neil Crumpton writes in *The Ecologist*: "Harrabin goes on to say, and make something out of, a change in FOE's stance on closing existing nuclear reactors. ... I never made any such calls in all the years I worked for FOE. I was FOE Cymru's specialist energy campaigner in Wales from about the mid 1990's and then the main anti-nuclear campaigner (England, Wales and Northern Ireland) between about 2005-2010. We had a pragmatic attitude and focussed our limited energy and funding on more winnable campaigns. So any shift regarding 'closure calls' would have been at least two decades ago and could not be portrayed as a recent shift or part of a refreshed 'less strongly anti-nuclear' stance. And if FOE had made any significant 'shift' or change in policy on nuclear power (or any other campaign area) the proposed change would have had to be submitted as a written motion to the annual conference, won the Local Groups' vote and received the agreement of the Board."<sup>7</sup>

Crumpton says the BBC should refresh its policy on corporate links – two BBC Trust figureheads are paid advisers to EdF: acting chair Diane Coyle and former chair Lord Patten.

#### References:

1. BBC interview: [www.bbc.co.uk/programmes/b04g8lmg](http://www.bbc.co.uk/programmes/b04g8lmg)
2. Adam Vaughan, 10 Sept 2014, 'Friends of the Earth denies dropping nuclear power opposition', [www.theguardian.com/environment/2014/sep/10/friends-of-the-earth-nuclear-power-bbc-report](http://www.theguardian.com/environment/2014/sep/10/friends-of-the-earth-nuclear-power-bbc-report)
3. Roger Harrabin, 12 Sept 2014, 'Friends of the Earth's shift on nuclear should be celebrated, not denied', [www.theguardian.com/environment/blog/2014/sep/12/friends-of-the-earths-shift-on-nuclear-should-be-celebrated-not-denied](http://www.theguardian.com/environment/blog/2014/sep/12/friends-of-the-earths-shift-on-nuclear-should-be-celebrated-not-denied)
4. FoE-UK, 10 Sept 2014, 'Radio 4 report on nuclear power', [www.foe.co.uk/resource/press\\_releases/radio-4-report-nuclear-power\\_10092014](http://www.foe.co.uk/resource/press_releases/radio-4-report-nuclear-power_10092014)
5. <http://realfeed-intariffs.blogspot.co.uk/2014/09/is-there-disinformation-campaign-to.html>
6. [www.world-nuclear-news.org/NP\\_Greenpeace\\_change\\_the\\_politics\\_1310091.html](http://www.world-nuclear-news.org/NP_Greenpeace_change_the_politics_1310091.html)
7. [www.theecologist.org/blogs\\_and\\_comments/commentators/2557652/the\\_bbc\\_friends\\_of\\_the\\_earth\\_and\\_nuclear\\_power.html](http://www.theecologist.org/blogs_and_comments/commentators/2557652/the_bbc_friends_of_the_earth_and_nuclear_power.html)

#### More information:

FoE-UK detailed briefing paper, August 2013, 'Why Friends of the Earth opposes plans for new nuclear reactors', [www.foe.co.uk/sites/default/files/downloads/nuclear\\_power\\_friends\\_of\\_t.pdf](http://www.foe.co.uk/sites/default/files/downloads/nuclear_power_friends_of_t.pdf)  
Mike Childs (FoE-UK), 2 Aug 2013, 'A hard-headed look at nuclear power'  
[www.foe.co.uk/news/nuclear\\_40884](http://www.foe.co.uk/news/nuclear_40884)

# Saudi Arabia's nuclear power program and its weapons ambitions

Author: Jim Green – Nuclear Monitor editor

**NM791.4414** On September 2, energy officials in the Kingdom of Saudi Arabia (KSA) announced plans to fast-track the development of nuclear power. Riyadh wants 16 reactors built by 2032, with the first online in 10 years or less.<sup>1,2,3</sup> The timeline is improbable but, for the moment at least, Riyadh seems intent on pursuing a nuclear power program.

In December 2006 the six member states of the Gulf Cooperation Council – Kuwait, Saudi Arabia, Bahrain, the UAE, Qatar and Oman – announced the commissioning of a study on the development of nuclear power. In February 2007 the Council agreed with the IAEA to cooperate on a feasibility study for a regional nuclear power and desalination program.<sup>2</sup>

The Gulf Cooperation Council initiative stalled but in 2009 Saudi Arabia announced it was considering developing its own nuclear power program. In April 2010 King Abdullah issued a royal decree stating that “development of atomic energy is essential to meet the Kingdom’s growing requirements for energy to generate electricity, produce desalinated water and reduce reliance on depleting hydrocarbon resources.” In order to fulfil the decree, the King Abdullah City for Nuclear and Renewable Energy (KACARE) was established in Riyadh. In 2011, plans were announced for the construction of 16 power reactors.<sup>4,5,6</sup>

According to KACARE, the “likely energy mix” in 2032 will comprise hydrocarbons (60 GW capacity); nuclear (17.6 GW); solar PV (16 GW); concentrated solar power (25 GW); wind (9 GW); waste-to-energy (3 GW); and geothermal (1 GW). KACARE states: “In this scenario, nuclear, geothermal and waste-to-energy will provide the base load up to night-time demand during winter; photovoltaic energy will meet total daytime demand year round; concentrated solar power, with storage, will meet the maximum demand difference between photovoltaic and base load technologies; and hydrocarbons will meet the remaining demand.”<sup>7</sup>

KACARE Vice President Waleed Abulfaraj says that only Generation 3 and 3+ reactors will be considered. Reactor vendors from around the world are manoeuvring to secure contracts – France, the US, South Korea, China, Russia and Japan. It seems likely that at least two consortia will be contracted to supply reactors.<sup>4,8,9</sup> Saudi Arabia will play potential suppliers off against each other to secure the best possible deals with add-ons such as training and technology transfer.

*Neutron Bytes* blogger Dan Yurman points to “significant challenges”: “For instance, where will the work force come from starting with contractors who can pour concrete to meet nuclear reactor standards? The supply chain issues are huge with contracting taking place

on a global scale. Then there is the question of all the skilled trades and engineers who will be needed for a decade or longer. On a cultural note, how well will the conservative KSA tolerate tens of thousands of workers, including women, who are not Muslims and who want to live their home country lifestyles?”<sup>10</sup>

Three sites have been short-listed given their proximity to coolant water sources, their position on the electrical grid and their location near electricity-intensive consumers, such as desalination plants. The sites are Jubail on the Gulf Coast and Tabuk and Jazan on the Red Sea.<sup>4</sup>

## Economics of nuclear power in Saudi Arabia

Does Saudi Arabia’s nuclear power program make sense? There is no pretence that hydrocarbons will be left *in situ* as a climate change mitigation measure – the plan is to increase hydrocarbon exports by partially substituting (growing) domestic demand with nuclear power and renewables. That substitution makes economic sense for oil, less so for gas. There is logic to the plan to marry baseload power sources with intermittent renewables – although energy storage technologies could weaken that logic.

A detailed economic analysis by Ali Ahmad and M.V. Ramana concludes: “Our results suggest that for a large range of parameters, the economics of nuclear power are not favorable in comparison with natural gas, even if the currently low domestic natural gas prices in Saudi Arabia were to rise substantially. Further, electricity from solar plants has the potential to be cheaper than nuclear power within the next decade if the rapid decline in solar energy costs in the last decade continue, i.e., before the first planned nuclear power plant would be completed. However, unless the price of oil drops substantially below current values, it would be more economically optimal to export the oil than using it for generating electricity.”<sup>11</sup>

For desalination, Ahmad and Ramana conclude that nuclear is more expensive than natural gas but “clearly cheaper” than concentrated solar power and solar PV.

## A weapons agenda?

Ahmad writes in the *Bulletin of the Atomic Scientists* that “Saudi Arabia’s motivation for pursuing nuclear technology is not based on a careful economic assessment of energy options, but on more complex security and political calculations.”<sup>12</sup>

It is no secret that Saudi Arabia is considering developing nuclear weapons. For example:

- Dennis Ross, a senior US diplomat and a former envoy to the Middle East, said that in April 2009 King Abdullah told him: “If they [Iran] get nuclear weapons, we will get nuclear weapons.”<sup>12</sup>

- In 2011, Prince Turki Al-Faisal, the former head of Saudi intelligence, said: "It is in our interest that Iran does not develop a nuclear weapon, for their doing so would compel Saudi Arabia ... to pursue policies that could lead to untold and possibly dramatic consequences."<sup>12</sup>
- In April 2014, Turki al-Faisal said: "Preserving our regional security requires that we, as a Gulf grouping, work to create a real balance of forces with [Iran], including in nuclear know-how."<sup>13</sup>
- Nawaf Obaid, a Senior Fellow at the King Faisal Center for Research and Islamic Studies in Riyadh, and Special Counselor to Prince Turki Al Faisal, said in December 2013: "But what is clear, and here there should be no room for misinterpretation or misunderstanding, is that if the Iranians are allowed to keep "an enrichment capability" that will over the medium- to long-term make them a de facto nuclear power, then Saudi Arabia, in keeping with its new emerging strategic doctrine, will have no choice but to go nuclear as well."<sup>14</sup>
- In a May 2014 paper, Nawaf Obaid wrote: "Of course, if Iran gets nuclear weapons (with Israel already having a nuclear arsenal), KSA will be forced to follow suit. Thus, KSA should explore its nuclear provision options in order to prepare for a very likely nuclear Iran in the medium-to-long term. ... If such a scenario occurs, KSA will initiate a domestic nuclear weapons program within a yet to be specified time-period to counter Iran's acquisition. A credible nuclear strategy would mandate that a rapid nuclear deterrent be obtained in the short term and that the establishment of an indigenous nuclear weapons program take shape over the medium- to long-term."<sup>15</sup>

In addition to lowering the barriers to a weapons capability, a Saudi nuclear power program – coupled with sabre-rattling about developing weapons – may be designed to force a stronger international response to Iran's nuclear program (in particular its enrichment program); and it could be used to leverage greater Saudi access to conventional military hardware (and on better terms).

Regardless of intent, a nuclear power program would bring Saudi Arabia far closer to a weapons capability. Power reactors in the normal course of operation produce large quantities of weapons-useable, reactor-grade plutonium and they could produce large quantities of weapon-grade plutonium by running reactor/s on a short operating cycle. Plutonium production would be of no consequence unless Saudi Arabia also develops a reprocessing capacity to separate plutonium from irradiated fuel.

In addition, a nuclear power program would necessarily entail the development of significant nuclear science and engineering expertise which could be redeployed to a weapons program. And a nuclear power program could justify the acquisition of other technologies – such as enrichment and reprocessing technology, and research/training reactors – which might be put to use in a weapons program.

### **Sensitive Nuclear Technologies**

A key question is whether Saudi Arabia will attempt to acquire 'Sensitive Nuclear Technologies' (SNT) –

enrichment and/or reprocessing – in conjunction with its nuclear power program. There is nothing more than an oblique reference to "fuel cycle research and development" on the KACARE website.<sup>16</sup>

Argentina's INVAP has been contracted to build Saudi Arabia's first research reactor – but it will be a very low-power (0.03 MWt) training reactor<sup>17</sup> and any reprocessing (hot cell) capacity associated with the research reactor will presumably be of little or no proliferation significance.

In 2007, Saudi Arabia, on behalf of the Gulf Cooperative Council, announced an offer to launch a regional enrichment consortium to establish an enrichment facility under the supervision of the IAEA in a neutral country, such as Switzerland, for all users of enriched uranium in the Middle East (including Iran).<sup>18</sup> However that proposal sunk without trace.

David Albright, president of the Institute for Science and International Security and a former IAEA weapons inspector, says he has heard concerns from a European intelligence agency that in recent years Saudi Arabia has been developing the engineering and scientific knowledge base to master the nuclear fuel cycle, and hiring scientists and engineers capable of building the cascades of centrifuges needed to enrich uranium.<sup>19</sup>

In early 2014 at the Munich Security Conference, Sen. Lindsey Graham asked Prince Turki al-Faisal if any final agreement that allowed Iran to maintain an enrichment capability would cause Saudi Arabia and other Arab states to invoke their own right to enrich uranium. "I think we should insist on having equal rights for everybody, this is part of the [Non-Proliferation Treaty] arrangement," the prince said.<sup>19</sup>

According to reports in 2010, Finnish power industry consulting company Poyry was contracted by Saudi Arabia to investigate the feasibility and prospects of enriching uranium in Saudi Arabia.<sup>20</sup>

### **Nuclear supplier states**

Might reactor supplier states make supply conditional on commitments from Riyadh not to develop SNT? If so, would those commitments be substantive and legally binding or would they be voluntary and not worth the paper they are written on?

The US and Saudi Arabia signed a Memorandum of Understanding on Nuclear Energy Cooperation in 2008. Announcing the MoU, the US State Department said: "Saudi Arabia has stated its intent to rely on international markets for nuclear fuel and to not pursue sensitive nuclear technologies, which stands in direct contrast to the actions of Iran."<sup>21</sup>

However for US companies to be involved in the development of nuclear technology in Saudi Arabia, the two countries would have to conclude a bilateral nuclear trade agreement (known as a 123 agreement). Informal discussions regarding a 123 agreement began in 2011 if not earlier.<sup>22</sup> The US State Department announced in 2013 that negotiations on a 123 agreement had commenced. However as *Global Security Newswire*

reported: “Democrats and Republicans alike have signaled they might block any U.S. nuclear cooperation with Saudi Arabia, particularly if Israel opposes such a deal. Of additional concern is the potential for instability in the kingdom, leading to worries about who might control sensitive nuclear technologies if the Saudi ruling family is ever expelled from power.”<sup>23</sup>

Reflecting a current of political opinion in the US, Rep. Illena Ros-Lehtinen (R., Fla.), then chair of the House Foreign Affairs Committee, said in 2011: “I’m astonished that the administration is even considering a nuclear cooperation agreement with Saudi Arabia.” She added that she thinks it is an “unstable country in an unstable region” and pointed to a statement by former ambassador al-Faisal about the possibility of Saudi Arabia developing nuclear weapons if Iran doesn’t curb its program.<sup>24</sup>

State Department official Thomas Countryman said in June 2013 that Washington is “discussing” with Riyadh an agreement which would prohibit the development of SNT in Saudi Arabia despite earlier indications that the Saudis were not amenable to the idea.<sup>25</sup>

The United Arab Emirates (UAE) agreed to forego SNT in its 123 agreement with the US. However the US has since relaxed the ‘gold standard’ of binding prohibitions on SNT and is now willing to conclude 123 agreements with (at most) voluntary, unenforceable commitments to forego SNT.

Even the UAE’s rejection of SNT could unravel – it is conditional on similar provisions being included in 123 agreements with other regional countries. Thus it is potentially jeopardised by developments in countries such as Iran, Jordan and Saudi Arabia. Iran is resisting pressure to dismantle its uranium enrichment program, while 123 negotiations between the US and Jordan and Saudi Arabia have reportedly been delayed and complicated by the unwillingness of Jordan and Saudi Arabia to agree to forego SNT.<sup>26</sup>

## **Pakistan**

Opposition in the US to nuclear trade with Saudi Arabia is largely driven by concern about possible collaboration between Saudi Arabia and Pakistan. In 2013, Senator Edward Markey, a Massachusetts Democrat, asked the president to share the administration’s assessment of possible nuclear co-operation between Saudi Arabia and Pakistan, and to halt talks about US-Saudi co-operation on the transfer of nuclear technology.<sup>27</sup>

Important moments in the nuclear history between Saudi Arabia and Pakistan are summarised in a March 2014 Washington Institute paper: “The most publicly discussed strategy for the Saudis involves acquiring nuclear weapons from Pakistan, either purchased or under some arrangement of joint control with Pakistani forces. In 1999, then Saudi defense minister Prince Sultan bin Abdulaziz visited Pakistan’s unsafeguarded centrifuge enrichment site at Kahuta near Islamabad and also saw mock-ups of Pakistan’s nuclear weapons. During the visit, Prince Sultan met the controversial Pakistani nuclear scientist A. Q. Khan, who was blamed for proliferating centrifuges to Iran, Libya, and North Korea, as well as then prime minister Nawaz Sharif, who

was later exiled to Saudi Arabia after a military coup and is now once again Pakistan’s prime minister.”<sup>5,12</sup>

Gary Samore, until March 2013 President Obama’s counter-proliferation adviser, told the BBC last year: “I do think that the Saudis believe that they have some understanding with Pakistan that, in extremis, they would have claim to acquire nuclear weapons from Pakistan.”<sup>28</sup>

There is informed speculation that Saudi financial support for Pakistani military programs – including perhaps its nuclear weapons program – may underpin an understanding or agreement between the two countries that could lead to the transfer of weapons or weapons technology to Saudi Arabia, or (perhaps most likely) an arrangement under which Pakistani nuclear forces could be deployed in Saudi Arabia.<sup>28</sup>

## **Safeguards**

Saudi Arabia concluded a ‘Comprehensive Safeguards Agreement’ with the IAEA in 2009. But Riyadh only agreed to an earlier version of the ‘Small Quantities Protocol (SQP)’ and has yet to accept the modified SQP adopted by the IAEA Board of Governors in 2005. Moreover Saudi Arabia – like Iran – has conspicuously failed to sign an Additional Protocol which would allow for more intrusive and wide-ranging IAEA inspections. Nor has Saudi Arabia signed the Comprehensive Nuclear Test Ban Treaty.<sup>5</sup>

If Saudi Arabia wanted to pursue uranium enrichment, Pakistan might be willing to assist; it may be the only country with relevant expertise willing to help. Moreover, Saudi Arabia, under its SQP obligations, could secretly build enrichment technology and need only tell the IAEA 180 days before introducing nuclear material – R&D, mechanical testing of centrifuges, and testing with surrogate materials, need not be revealed.<sup>5</sup>

Canadian officials have expressed concerns about the potential for Saudi Arabia to pursue nuclear weapons. “Minimal safeguards are in place in SA [Saudi Arabia] to verify peaceful uses of nuclear energy ... and it has refused to accept strengthened safeguards,” officials said in an assessment prepared for Canada’s Foreign Affairs Minister in March 2012. “Many observers question SA’s nuclear intentions, especially if Iran were to acquire a nuclear weapons capability. As a result, SA does not meet Canada’s requirements for nuclear cooperation.”<sup>29</sup>

China, France and South Korea have completed nuclear cooperation agreements with Saudi Arabia<sup>29</sup> and it is unlikely those agreements contain any meaningful non-proliferation clauses.

## **What should be done?**

Nuclear supplier states could collectively agree that nuclear technology transfer to Saudi Arabia will be conditional on a Riyadh accepting binding, meaningful commitments not to develop or acquire SNT. But there is no chance of that happening and some supplier states have already concluded agreements without any SNT prohibition.

The Washington Institute paper makes these recommendations: “Experience suggests that military nuclear programs are best stopped at their earlier

stages. Inaction, as the world has seen with Pakistan and North Korea and, more recently, Iran and Syria, leads to wicked problems. Saudi Arabia should thus be encouraged to sign the Additional Protocol to its NPT Safeguards Agreement and implement it provisionally until ratified. The Saudis should also be urged to rescind their SQP and conclude up-to-date subsidiary arrangements to the Safeguards Agreement with the IAEA. These gestures would oblige the kingdom to give the IAEA design information about nuclear installations as soon as the decision is made to build them. The IAEA would likewise have access to all nuclear-fuel-cycle-related installations, even if they did not use nuclear material. Such provisions should be included

in any U.S.-Saudi 123 agreement and are initial steps toward a nuclear-weapons-free Middle East.”<sup>5</sup>

There is little reason for optimism. India provides a comparison – nuclear supplier states are falling over themselves to get into the Indian nuclear market with no requirement for India to forego SNT, or to sign the Comprehensive Test Ban Treaty, or to curb its nuclear weapons program in any way.

And while the Obama administration might prefer to kick the can down the road, difficult decisions regarding a 123 agreement may need to be made sooner rather than later if indeed Riyadh does intend to fast-track a nuclear power program.

#### References:

1. 'Saudis Announce Plan to Build 1st Nuclear Reactor', 2 Sept 2014, [www.algemeiner.com/2014/09/02/saudis-announce-plan-to-build-1st-nuclear-reactor/](http://www.algemeiner.com/2014/09/02/saudis-announce-plan-to-build-1st-nuclear-reactor/)
2. WNA, Sept 2014, 'Nuclear Power in Saudi Arabia', <http://www.world-nuclear.org/info/Country-Profiles/Countries-O-S/Saudi-Arabia/>
3. James Conca, 8 Sept 2014, 'Saudi Arabia Fast-Tracks Nuclear Power', [www.forbes.com/sites/jamesconca/2014/09/08/saudi-arabia-fast-tracks-nuclear-power/](http://www.forbes.com/sites/jamesconca/2014/09/08/saudi-arabia-fast-tracks-nuclear-power/)
4. 14 Jan 2014, 'Future of Nuclear Energy in Emerging Markets: Kingdom of Saudi Arabia', <http://forumonenergy.com/2014/01/14/future-of-nuclear-energy-in-emerging-markets-kingdom-of-saudi-arabia/>
5. Olli Heinonen and Simon Henderson, 27 March 2014, 'Nuclear Kingdom: Saudi Arabia's Atomic Ambitions', [www.washingtoninstitute.org/policy-analysis/view/nuclear-kingdom-saudi-arabias-atomic-ambitions](http://www.washingtoninstitute.org/policy-analysis/view/nuclear-kingdom-saudi-arabias-atomic-ambitions)
6. Ana Komnenic, 6 Jan 2014, 'Why does Saudi Arabia need nuclear power?', [www.mining.com/why-does-saudi-arabia-need-nuclear-power-66922/](http://www.mining.com/why-does-saudi-arabia-need-nuclear-power-66922/)
7. KACARE, 'Energy Sustainability for Future Generations', [www.kacare.gov.sa/en/?page\\_id=84](http://www.kacare.gov.sa/en/?page_id=84)
8. Daniel Fineren, 23 April 2014, 'Nuclear Saudi Arabia a lifeline for the atomic energy industry', <http://uk.reuters.com/article/2013/04/23/uk-saudi-nuclear-idUKLNE93M00M20130423>
9. WNA 9 September 2013, 'Teaming up for Saudi bids', [www.world-nuclear-news.org/NN-Teaming\\_up\\_for\\_Saudi\\_bids-0909137.html](http://www.world-nuclear-news.org/NN-Teaming_up_for_Saudi_bids-0909137.html)
10. Dan Yurman, 2 Sept 2014, 'Saudis update ambitious nuclear energy plans', <http://neutronbytes.com/2014/09/02/saudis-update-ambitious-nuclear-energy-plans/>
11. Ali Ahmad and M.V. Ramana, 1 May 2014, 'Too costly to matter: Economics of nuclear power for Saudi Arabia', *Energy & Environment*, Vol 69, pp.682–694, [www.sciencedirect.com/science/article/pii/S0360544214003284](http://www.sciencedirect.com/science/article/pii/S0360544214003284)
12. Ali Ahmad, 17 Dec 2013, 'The Saudi proliferation question', *Bulletin of Atomic Scientists*, <http://thebulletin.org/saudi-proliferation-question>
13. 24 April 2014, 'Saudi Prince Urges Mideast Counterbalance to Iran's 'Nuclear Know-How'', [www.nti.org/gsn/article/saudi-prince-urges-gulf-countries-balance-irans-nuclear-know-how/](http://www.nti.org/gsn/article/saudi-prince-urges-gulf-countries-balance-irans-nuclear-know-how/)
14. Nawaf Obaid, 3 Dec 2013, 'The Iran deal: a view from Saudi Arabia', <http://iranmatters.belfercenter.org/blog/iran-deal-view-saudi-arabia>
15. Nawaf Obaid, 27 May 2014, 'A Saudi Arabian Defense Doctrine', [http://belfercenter.ksg.harvard.edu/publication/24254/saudi\\_arabian\\_defense\\_doctrine.html](http://belfercenter.ksg.harvard.edu/publication/24254/saudi_arabian_defense_doctrine.html)
16. [www.kacare.gov.sa/en/?page\\_id=86](http://www.kacare.gov.sa/en/?page_id=86)
17. Eman El-Shenawi, 29 June 2011, 'Saudi Arabia signs nuclear-energy deal with Argentina', [www.alarabiya.net/articles/2011/06/29/155288.html](http://www.alarabiya.net/articles/2011/06/29/155288.html)
18. Mark Fitzpatrick, Jan/Feb 2009, 'Drawing a Bright Redline: Forestalling Nuclear Proliferation in the Middle East', [www.armscontrol.org/act/2009\\_01-02/Fitzpatrick](http://www.armscontrol.org/act/2009_01-02/Fitzpatrick)
19. NTI, 14 Feb 2014, 'Report: Saudi Arabia Wants Uranium-Enrichment Capacity', [www.nti.org/gsn/article/saudi-arabia-reportedly-wants-develop-full-nuclear-fuel-cycle/](http://www.nti.org/gsn/article/saudi-arabia-reportedly-wants-develop-full-nuclear-fuel-cycle/)
20. Mark Hibbs, 24 Aug 2010, 'Saudi Arabian Uranium Enrichment?', <http://hibbs.armscontrolwonk.com/archive/8/saudi-arabian-uranium-enrichment>
21. US State Department, 16 May 2008, 'U.S.-Saudi Arabia Memorandum of Understanding on Nuclear Energy Cooperation', <http://2001-2009.state.gov/r/pa/prs/ps/2008/may/104961.htm>
22. Daniel Horner, Sept 2011, 'U.S., Saudi Arabia Mull Nuclear Talks', [www.armscontrol.org/2011\\_09/US\\_Saudi\\_Arabia\\_Mull\\_Nuclear\\_Talks](http://www.armscontrol.org/2011_09/US_Saudi_Arabia_Mull_Nuclear_Talks)
23. Elaine M. Grossman, 1 Feb 2013, 'U.S. Nuclear Marketers Visited Saudi Arabia, As Trade Talks Under Way', <http://www.nti.org/gsn/article/us-nuclear-marketers-visited-saudi-arabia-trade-talks-under-way/>
24. Dan Yurman, 23 Aug 2011, 'Saudi Arabia's Nuclear Energy Ambitions', <http://theenergycollective.com/ansorg/63481/saudi-arabia-s-nuclear-energy-ambitions>
25. Elaine M. Grossman, 29 July 2013, 'Q&A: Envoy Says Saudi Nuclear Pact 'Would Not' Lead to Weapons', [www.nti.org/gsn/article/q-envoy-says-saudi-nuclear-pact-would-not-lead-weapons/](http://www.nti.org/gsn/article/q-envoy-says-saudi-nuclear-pact-would-not-lead-weapons/)
26. Mark Hibbs and Fred McGoldrick, 15 Oct 2013, 'Policy on Sensitive Nuclear Activities', <http://carnegieendowment.org/2013/10/15/realistic-and-effective-policy-on-sensitive-nuclear-activities/gqeu>
27. Mark Urban, 22 Nov 2013, 'Saudi nuclear weapons: US senator demands Obama action', [www.bbc.co.uk/news/world-middle-east-24855902](http://www.bbc.co.uk/news/world-middle-east-24855902)
28. Mark Urban, 6 Nov 2013, 'Saudi nuclear weapons 'on order' from Pakistan', [www.bbc.com/news/world-middle-east-24823846](http://www.bbc.com/news/world-middle-east-24823846)
29. NTI, 29 Jan 2013, 'Saudi Atomic Aims Worry Canada', [www.nti.org/gsn/article/saudi-atomic-aims-worry-canada/](http://www.nti.org/gsn/article/saudi-atomic-aims-worry-canada/)

# Fukushima Fallout: Updates from Japan

## Japan–India Nuclear Cooperation Agreement

**NM791.4415** Japanese prime minister Shinzo Abe and the Indian prime minister Narendra Modi discussed a proposed Nuclear Cooperation Agreement during Modi's recent visit to Japan, but the two countries have yet to finalise the agreement. In addition to ongoing work to finalise a Nuclear Cooperation Agreement, the prime ministers affirmed their commitment to work toward India becoming a full member of the Nuclear Suppliers Group.<sup>1</sup>

Negotiations on a Nuclear Cooperation Agreement began in 2010 but they were suspended after the March 2011 Fukushima disaster. The resumption of negotiations was announced during a May 2013 meeting between Abe and India's then prime minister Manmohan Singh.

According to a former Indian ambassador, obstacles include Japan's insistence that no reprocessing of spent fuel would be done in India, and that in the event of a nuclear test by India, the components supplied would be immediately returned to Japan.<sup>2</sup>

According to Reuters, Japan wants more intrusive inspections of India's nuclear facilities to ensure that spent fuel is not diverted, and explicit Indian guarantees not to conduct nuclear weapons tests.<sup>3</sup> Japan wants something stronger than India's self-imposed moratorium on weapons tests. India refuses to sign the Comprehensive Test Ban Treaty.

International Atomic Energy Agency safeguards apply only to that part of the nuclear program that India considers surplus to military "requirements". IAEA safeguards inspections in India will at best be tokenistic. For example a leaked IAEA document states: "The frequency and intensity of IAEA inspections shall be kept to the minimum consistent with the aim of improving safeguards." That is standard diplomatic jargon – it means that safeguards will be infrequent or non-existent except in circumstances where the IAEA wants to test novel safeguards technologies or procedures and India agrees to take part.<sup>4</sup>

It is likely that another complication is India's law regarding nuclear liability. The law does not completely absolve nuclear suppliers of responsibility in the event of nuclear accidents. Nuclear suppliers and their governments are seeking to avoid any liability whatsoever.

355 organisations in 22 countries have signed a petition calling for the Japan–India Nuclear Cooperation Agreement to be scrapped.<sup>5</sup>

1. [www.world-nuclear-news.org/NP-India-Japan-continue-talks-on-nuclear-deal-0309144.html](http://www.world-nuclear-news.org/NP-India-Japan-continue-talks-on-nuclear-deal-0309144.html)

2. [www.thehindubusinessline.com/opinion/the-nuclear-thorn-in-indiajapan-ties/article6383865.ece](http://www.thehindubusinessline.com/opinion/the-nuclear-thorn-in-indiajapan-ties/article6383865.ece)

3. <http://in.reuters.com/article/2014/08/27/india-japan-nuclear-modi-idINKBN0GR28U20140827>

4. [www.onlineopinion.com.au/view.asp?article=12965&page=0](http://www.onlineopinion.com.au/view.asp?article=12965&page=0)

5. [www18.ocn.ne.jp/~nnaf/129d.htm](http://www18.ocn.ne.jp/~nnaf/129d.htm)

## Reactor restart debates

On September 10, Japan's Nuclear Regulation Authority (NRA) announced that it had approved Kyushu Electric Power Company's design and safety features for the two Sendai reactors. Kyushu received draft NRA approval in mid-July. Two smaller regulatory approvals remain before the Sendai plant can restart. The NRA said that it will now review the detailed design and construction of the reactors and related facilities, as well as operational safety programs and procedures for accident responses. These final stages could possibly be completed by the end of the year according to the World Nuclear Association.<sup>1</sup>

Once those steps are complete, the NRA would be able to issue its final approval for operation. Kyushu would also need to gain approval from political leaders in Kagoshima prefecture – though that is not a legal requirement. The federal government has the final say on whether nuclear power plants operate.<sup>1</sup>

Greenpeace said: "The decision really means that Kyushu Electric has moved restarting the Sendai reactors forward a bit, but it's still not a restart approval. It doesn't mean the NRA has certified the reactors as safe to operate or that they will restart anytime soon."<sup>2</sup>

Sendai, at the southern end of the island of Kyushu, is 50 kms from an active volcano. "No-one believes that volcanic risks have been adequately discussed," said Setsuya Nakada, a professor of volcanology at the University of Tokyo, in June.<sup>3</sup> The inadequacy of evacuation plans, and the NRA's unwillingness to consider evacuation plans in its reactor restart decisions, is another bone of contention.<sup>4</sup>

The pro-nuclear governor of the prefecture where the Sendai plant is located and the mayor of Satsumasendai, the plant's host city, are likely to approve the restart of Sendai reactors, but many nearby townships are opposed. More than half of the 30,000 residents in Ichikikushikino, a coastal town 5 kms from the plant, submitted a petition mid-year opposing a restart.<sup>5</sup>

None of Japan's 48 'operational' reactors are currently operating; none have operated since the Ohi 4 reactor in Fukui prefecture was shut down on September 15 2013. Reactor restart applications for 18 other reactors have been submitted to the NRA.<sup>1</sup>

A Reuters analysis earlier this year concluded that fewer than one-third, and at most about two-thirds, of the 48 reactors will pass NRA safety checks and clear the other seismological, economic, logistical and political hurdles needed to restart. The analysis was based on questionnaires and interviews with more than a dozen experts and input from the 10 nuclear operators.<sup>6</sup>

According to Reuters: "Some reactors can essentially be ruled out, like Tepco's Fukushima Daini station, which is well within the Daiichi plant evacuation zone and faces near-universal opposition from a traumatised local population. Also highly unlikely to switch back on is Japan Atomic Power Co's Tsuruga plant west of Tokyo. It sits on an active fault, according to experts commissioned by the

NRA. Twelve reactors will reach or exceed the standard life expectancy of 40 years within the next five years, probably sealing their fate in the new, harsher regulatory climate. These include reactor No. 1 at Shikoku Electric's Ikata power station. The outlook is less clear for about a third of the other 48 reactors."<sup>6</sup>

RBC Capital Markets analysts Fraser Phillips and Patrick Morton argued in June that 28 reactors – just over half – will be online by 2018.<sup>7</sup> Similarly, energy industry consultant (and former CEO of Ontario Hydro International) Thomas Drolet, said in February: "I don't believe predictions that most of the 49 reactors will come back. My prediction is that about half of that, about 25, will eventually come back, gradually and carefully over the next five years. The basic rationale for that is some of the reactors, the Mark I BWR, may never get re-permitted in Japan. Secondly, some local governments just don't want them."<sup>8</sup>

Some government and industry representatives are openly discussing the permanent shut-down of ageing reactors. For example, Yuko Obuchi, the minister for economy, trade and industry, said in early September: "For myself, I would like to proceed with smooth decommissioning (of some plants) and at the same time the restart of nuclear power stations certified as safe."<sup>9</sup> Kansai Electric Power Co. is one of the utilities considering that strategy. Kansai is considering decommissioning two ageing reactors at its Mihama nuclear power plant in Fukui Prefecture, but is intent on restarting two others at its Takahama plant in the same prefecture.<sup>10</sup>

Jeff Kingston, director of Asian Studies at Temple University's Japan campus, told Reuters in April: "I think the government is incredibly clever by doing the restarts in the most modern, advanced places that have the most local support and are yet far from centres of political activity. Then you use that to create momentum for the agenda of restarting as many reactors as possible."<sup>6</sup>

Some reports suggest that around a dozen reactors may be permanently shut down because they are either too old or too costly to upgrade.<sup>11</sup> Twelve reactors began operation in the 1970s.<sup>12</sup> A survey of utilities earlier this year by the *Asahi Shimbun* newspaper found that there was no near-term likelihood of restarting 30 reactors. Thirteen of those, mainly due to their age, are having particular difficulty in complying with the new standards according to the survey, and are likely to be decommissioned.<sup>10</sup>

Academics Daniel Aldrich and James Platte noted in an article in August: "By the end of 2020, 13 reactors will have reached the 40-year limit of their operating licenses, and an additional 10 more reactors will be 40 years old by 2025. Unless the NRA begins considering license extensions, it seems reasonable to assume that most of these older reactors will not restart. Thus, one could estimate that 25 to 30 reactors would restart in the next five years or so, and this does not account for newer reactors that the NRA or local governments could declare unfit for restart. While restarting some reactors will help generate revenue for Japan's struggling power utilities, the cost of decommissioning about half of Japan's pre-Fukushima reactor fleet will be significant. Despite the nuclear revival ambitions of the LDP and industrial leaders, Japan's nuclear sector appears to have a long, difficult road ahead of it."<sup>13</sup>

#### References:

1. [www.world-nuclear-news.org/RS-Final-restart-nears-approaches-for-Sendai-1009144.html](http://www.world-nuclear-news.org/RS-Final-restart-nears-approaches-for-Sendai-1009144.html)
2. [www.greenpeace.org/international/en/news/Blogs/nuclear-reaction/Sendai-reactor-restart/blog/50534/](http://www.greenpeace.org/international/en/news/Blogs/nuclear-reaction/Sendai-reactor-restart/blog/50534/)
3. <http://planetark.org/enviro-news/item/71647>
4. [www.japantimes.co.jp/news/2014/07/22/national/kagoshima-nuclear-plant-evacuation-plans-flawed/](http://www.japantimes.co.jp/news/2014/07/22/national/kagoshima-nuclear-plant-evacuation-plans-flawed/)  
<http://planetark.org/enviro-news/item/71788>
5. [www.nytimes.com/2014/07/17/world/asia/japanese-nuclear-plant-is-first-to-get-go-ahead-under-new-rules.html](http://www.nytimes.com/2014/07/17/world/asia/japanese-nuclear-plant-is-first-to-get-go-ahead-under-new-rules.html)
6. [www.reuters.com/article/2014/04/01/japan-nuclear-restarts-idUSL1N0MM0AU20140401](http://www.reuters.com/article/2014/04/01/japan-nuclear-restarts-idUSL1N0MM0AU20140401)
7. <http://business.financialpost.com/2014/06/05/rbc-annihilates-uranium-price-outlook/>
8. [www.marketwatch.com/story/the-fukushima-effect-nuclear-expert-thomas-drolet-discusses-the-disaster-the-aftermath-and-the-outlook-for-uranium-2014-02-17](http://www.marketwatch.com/story/the-fukushima-effect-nuclear-expert-thomas-drolet-discusses-the-disaster-the-aftermath-and-the-outlook-for-uranium-2014-02-17)
9. [www.japantimes.co.jp/news/2014/09/10/national/japan-ok-nuclear-plant-return-pushing-close-old-reactors/](http://www.japantimes.co.jp/news/2014/09/10/national/japan-ok-nuclear-plant-return-pushing-close-old-reactors/)
10. <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201409050037>
11. [www.scientificamerican.com/article/aging-nuclear-reactors-may-close-in-japan/](http://www.scientificamerican.com/article/aging-nuclear-reactors-may-close-in-japan/)
12. <http://world-nuclear.org/nucleardatabase/rdResults.aspx?id=27569>
13. [www.washingtonpost.com/blogs/monkey-cage/wp/2014/08/15/after-the-fukushima-meltdown-japans-nuclear-restart-is-stalled/](http://www.washingtonpost.com/blogs/monkey-cage/wp/2014/08/15/after-the-fukushima-meltdown-japans-nuclear-restart-is-stalled/)

## NUCLEAR NEWS

### **Killing the competition: US nuclear front groups exposed**

A new report released by the Nuclear Information & Resource Service details US industry plans to subvert clean energy programs, rig energy markets and climate regulations to subsidize aging nuclear reactors.

A coalition of five organizations was joined by renowned energy economist Dr Mark Cooper to release the report, titled 'Killing the Competition: The Nuclear Power Agenda to Block Climate Action, Stop Renewable Energy, and Subsidize Old Reactors'.

The report details the industry's attacks on clean energy and climate solutions and the key battlegrounds in this new fight over the US's energy future. With large political war chests and armies of lobbyists, the power companies have opened up aggressive fights across the country this year:

- Blocking tax breaks for renewable energy in Congress.
- Killing renewable energy legislation in Illinois by threatening to close nuclear plants.
- Passing a resolution calling for nuclear subsidies and emissions-trading schemes in Illinois.

- Suspending renewable energy and efficiency standards in Ohio for two years.
- Ending energy efficiency programs in Indiana.
- Demanding above-market contracts for nuclear and coal plants in Ohio and New York.

Last year, the closure of several reactors highlighted the worsening economics of nuclear energy. Five reactor shutdowns were announced, and eight new reactors cancelled. The industry's rising costs – with new plants too expensive to build and old plants more and more costly to maintain – came head to head with a brewing energy revolution: low natural gas prices, rising energy efficiency, and affordable wind and solar power. As a result, Wall Street firms reassessed the industry, discovering an industry at risk and predicting more shuttered reactors in the coming years.

Energy economist Dr. Mark Cooper, of Vermont Law School's Institute for Energy and the Environment, published a paper outlining the factors contributing to nuclear energy's poor prospects and highlighting the vulnerability of dozens of reactors. Dr Cooper said: "Nuclear power simply cannot compete with efficiency and renewable resources and it does not fit in the emerging electricity system that uses intelligent management of supply and demand response to meet the need for electricity. Doubling down on nuclear power as the solution to climate change, as proposed by nuclear advocates, is a bad bet since nuclear power is one of the most expensive ways available to cut carbon emissions in the electricity sector. The nuclear war against clean energy is a last ditch effort to stop the transformation of the electricity sector and prevent nuclear power from becoming obsolete."

*NIRS, 2014, "Killing the Competition: The Nuclear Power Agenda to Block Climate Action , Stop Renewable Energy, and Subsidize Old Reactors", [www.nirs.org/neconomics/killingthecompetition914.pdf](http://www.nirs.org/neconomics/killingthecompetition914.pdf)*

### **Oldest Indian reactor will not restart**

After 10 years in long-term outage, it was reported on September 6 that there will be no restart for the first unit of Rajasthan Atomic Power Station (RAPS-1), located at Rawatbata, 64 km southwest of Kota in the north-western Indian state of Rajasthan. The 100 MW Pressurized Heavy Water Reactor, which was supplied to India under a 1963 agreement with Canada, operated from 1972 to 2004, though with multiple extended shutdowns. Cooperation with Canada was suspended following India's 1974 nuclear weapons test; however design details for the reactor had already been transferred to India.

[www.worldnuclearreport.org/Oldest-Indian-Reactor-Will-Not.html](http://www.worldnuclearreport.org/Oldest-Indian-Reactor-Will-Not.html)

[www.deccanherald.com/content/429550/end-road-raps-1.html](http://www.deccanherald.com/content/429550/end-road-raps-1.html)

### **Czech Republic:**

#### **March against uranium in Brzkov**

A march against planned uranium mining on September 7 was attended by approximately 200 people. The march was organised by the association 'Our Future

Without Uranium', which expresses the disapproval of the Brzkov population with the government's intention to resume uranium mining. During the day citizens signed the petition by the civic association called "NO to Uranium Mining in the Highlands".

[www.nuclear-heritage.net/index.php/March\\_against\\_uranium\\_in\\_Brzkov](http://www.nuclear-heritage.net/index.php/March_against_uranium_in_Brzkov)

### **What went wrong with small modular reactors?**

Thomas W. Overton, associate editor of POWER magazine, writes: "At the graveyard wherein resides the "nuclear renaissance" of the 2000s, a new occupant appears to be moving in: the small modular reactor (SMR). ... Over the past year, the SMR industry has been bumping up against an uncomfortable and not-entirely-unpredictable problem: It appears that no one actually wants to buy one."

Overton notes that in 2013, MidAmerican Energy scuttled plans to build an SMR-based plant in Iowa. This year, Babcock & Wilcox scaled back much of its SMR program and sacked 100 workers in its SMR division. Westinghouse has abandoned its SMR program.

Overton explains: "The problem has really been lurking in the idea behind SMRs all along. The reason conventional nuclear plants are built so large is the economies of scale: Big plants can produce power less expensively per kilowatt-hour than smaller ones. The SMR concept disdains those economies of scale in favor of others: large-scale standardized manufacturing that will churn out dozens, if not hundreds, of identical plants, each of which would ultimately produce cheaper kilowatt-hours than large one-off designs. It's an attractive idea. But it's also one that depends on someone building that massive supply chain, since none of it currently exists. ... That money would presumably come from customer orders – if there were any. Unfortunately, the SMR "market" doesn't exist in a vacuum. SMRs must compete with cheap natural gas, renewables that continue to decline in cost, and storage options that are rapidly becoming competitive. Worse, those options are available for delivery now, not at the end of a long, uncertain process that still lacks NRC approval."

[www.powermag.com/what-went-wrong-with-smrs/](http://www.powermag.com/what-went-wrong-with-smrs/)

### **India's new uranium enrichment plant in Karnataka**

David Albright and Serena Kelleher-Vergantini write in an Institute for Science and International Security report: "India is in the early stages of building a large uranium enrichment centrifuge complex, the Special Material Enrichment Facility (SMEF), in Karnataka. This new facility will significantly increase India's ability to produce enriched uranium for both civil and military purposes, including nuclear weapons. India should announce that the SMEF will be subject to International Atomic Energy Agency (IAEA) safeguards, committed only to peaceful uses, and built only after ensuring it is in compliance with environmental laws in a process that fully incorporates stakeholders. Other governments and suppliers of nuclear and nuclear-related dual use goods throughout the world must be vigilant to prevent

efforts by Indian trading and manufacturing companies to acquire such goods for this new enrichment facility as well as for India's operational gas centrifuge plant, the Rare Materials Plant, near Mysore."

<http://isis-online.org/isis-reports/detail/indias-new-uranium-enrichment-plant-in-karnataka1/>

### Iran planning two more power reactors

The Atomic Energy Organization of Iran (AEOI) plans to build two new nuclear power reactors, Bushehr Governor General Mostafa Salari announced on September 7. The previous week, AEOI chief Ali Akbar Salehi said that Tehran would sign a contract with Russia in the near future to build the two reactors in Bushehr. The AEOI states that the agreement with Russia will also include the construction of two desalination units.<sup>1</sup>

One Russian-supplied power reactor is already operating at Bushehr. Fuel is supplied by Russia until 2021 and perhaps beyond. Plans for new reactors may be used by Tehran to justify its enrichment program.

Meanwhile, construction licenses have been issued for the next two nuclear reactors in the United Arab Emirates by the country's Federal Authority for Nuclear Regulation. Emirates Nuclear Energy Corporation plans to begin construction of Barakah 3 and 4 in 2014 and 2015 respectively with all four of the site's reactors becoming operational by 2020.<sup>2</sup>

1. <http://english.farsnews.com/newstext.aspx?nn=13930616001123>
2. World Nuclear News, 15 Sept 2014

### Depleted uranium as a carcinogen and genotoxin

The International Campaign to Ban Uranium Weapons has produced a new report outlining the growing weight of evidence relating to how depleted uranium (DU) can damage DNA, interfere with cellular processes and contribute to the development of cancer.<sup>1</sup> The report uses peer-reviewed studies, many of which have been published during the last decade and, wherever possible, has sought to simplify the scientific language to make it accessible to the lay reader.

The report concludes: "The users of DU have shown themselves unwilling to be bound by the consequences of their actions. The failure to disclose targeting data or follow their own targeting guidelines has placed civilians at unacceptable risk. The recommendations of international and expert agencies have been adopted selectively or ignored. At times, users have actively opposed or blocked efforts to evaluate the risks associated with contamination. History suggests it is unlikely that DU use will be stopped voluntarily: an international agreement banning the use of uranium in conventional weapons is therefore required."

A report released by Dutch peace organisation PAX in June found that the lack of obligations on Coalition Forces to help clean-up after using DU weapons in Iraq in 1991 and 2003 has resulted in civilians and workers continuing to be exposed to the radioactive and toxic heavy metal years after the war.<sup>2</sup> The health risk posed by the inadequate management of Iraq's DU contamination is unclear – neither Coalition Forces nor

the Iraqi government have supported health research into civilian DU exposure. High risk groups include people living near, or working on, the dozens of scrap metal sites where the thousands of military vehicles destroyed in 1991 and 2003 are stored or processed. Waste sites often lack official oversight and in places it has taken more than a decade to clean-up heavily contaminated military wreckage from residential neighbourhoods. Hundreds of locations targeted by the weapons, many of which are in populated areas, remain undocumented and concern among Iraqi civilians over the potential health effects from exposure is widespread.

The Iraqi government has recently prepared a five year environment plan together with the World Health Organisation and UN Environment Programme but the PAX report finds that it is unclear how this will be accomplished without international assistance.

1. [www.bandepleteduranium.org/en/malignant-effects](http://www.bandepleteduranium.org/en/malignant-effects)
2. [www.paxvoorvrede.nl/media/files/pax-rapport-iraq-final-lowres-spread.pdf](http://www.paxvoorvrede.nl/media/files/pax-rapport-iraq-final-lowres-spread.pdf)  
[www.bandepleteduranium.org/en/no-solution-in-sight-for-iraqs-radioactive-scrap](http://www.bandepleteduranium.org/en/no-solution-in-sight-for-iraqs-radioactive-scrap)

### Clean-up of former Saskatchewan uranium mill

More than 50 years after the closure of the Lorado uranium mill in Saskatchewan, workers are cleaning up a massive pile of radioactive, acidic tailings that has poisoned a lake and threatened the health of wildlife and hunters for decades. The mill is near Uranium City, where uranium mining once supported a community of up to 5,000 people. Lorado only operated from 1957 to 1961, but during that time it produced about 227,000 cubic metres of tailings that were dumped beside Nero Lake. Windblown dust from the top of the tailings presents a gamma radiation and radon concern. Workers will cover the tailings with a layer of specially engineered sand to prevent water from running over them and into the lake. In addition, a lime mixture is to be added to the lake to counteract the acidity.

In 1982, the last of the mines near Uranium City closed, but tailings from the Lorado site and the Gunnar mine were left untouched. Uranium City has about 100 residents now.

Clean-up work also includes sealing off and cleaning up 35 mine exploration sites. Later, the Saskatchewan Research Council is to begin a cleanup of the Gunnar mine. That project is in the environmental assessment stage. Four million tonnes of tailings were produced at Gunnar during its operation from 1955 to 1963.

The clean-up project is controversial. The Prince Albert Grand Council, which represents a dozen First Nations in central and northern Saskatchewan, said in a written submission for the Lorado and Gunnar projects that many residents favour removal of the tailings rather than covering them up. The Saskatchewan Environmental Society says more investigation should have been done on the feasibility of removing the tailings. It questions how the covering will stand up as climate change delivers more severe weather, and whether government will continue to monitor the sites.

<http://lethbridgeherald.com/news/national-news/2014/08/31/tough-conditions-for-cleanup-50-years-later-of-former-saskatchewan-uranium-mill/>



Greenpeace action at the Fessenheim nuclear plant, 18 March 2014.  
Photo by Bente Stachowske / Greenpeace.

### France: Greenpeace activists given suspended sentences

A French court has issued two-month suspended prison sentences to 55 Greenpeace activists involved in a break-in at France's Fessenheim nuclear power plant in March. Fessenheim is France's oldest nuclear plant. About 20 Greenpeace activists managed to climb on top of the dome of a reactor in Fessenheim. The activists, mostly from Germany but also from Italy, France, Turkey, Austria, Hungary, Australia and Israel, were all convicted of trespassing and causing wilful damage.

Greenpeace has identified Fessenheim's reactors as two of the most dangerous in Europe and argues that they should be shut down immediately. The area around the plant is vulnerable to earthquakes and flooding. Fessenheim lies in the heart of Europe, between France, Germany and Switzerland, with seven million people living with 100 kms of the reactors.

[www.bbc.co.uk/news/world-europe-29060086](http://www.bbc.co.uk/news/world-europe-29060086)

[www.english.rfi.fr/economy/20140905-greenpeace-activists-given-suspended-sentences-french-nuclear-power-station-break](http://www.english.rfi.fr/economy/20140905-greenpeace-activists-given-suspended-sentences-french-nuclear-power-station-break)

<http://www.greenpeace.org/international/en/news/Blogs/nuclear-reaction/greenpeace-activists-occupy-frances-fessenheim/blog/48557/>

### USA: Missouri fire may be moving closer to radioactive waste

A new report suggests an underground fire at the Bridgeton Landfill may be moving closer to radioactive waste buried nearby. The information comes just days after it was announced construction of a barrier between the fire and the waste will be delayed 18 months.

The South Quarry of the Bridgeton Landfill has been smouldering underground for three years. A number of gas interceptor wells are designed to keep the fire from moving north and reaching the radioactive waste buried at the West Lake Landfill. However the wells may have failed according to landfill consultant Todd Thalhamer, who is calling for more tests to determine exactly how far the fire is from the radioactive material.

[www.ksdk.com/story/news/local/2014/09/05/report-landfill-fire-may-be-moving-closer-to-waste/15163559/](http://www.ksdk.com/story/news/local/2014/09/05/report-landfill-fire-may-be-moving-closer-to-waste/15163559/)

[http://en.wikipedia.org/wiki/West\\_Lake\\_Landfill](http://en.wikipedia.org/wiki/West_Lake_Landfill)

### Britain's nuclear clean-up cost explosion

The cost of cleaning up Britain's toxic nuclear sites has shot up by £6bn (US\$9.7b, €7.5b), with the government and regulators accused of "incompetence" in their efforts to manage the country's legacy of radioactive waste. The estimated cost for decommissioning over the next century went up from a £63.8bn estimate in 2011-12 to £69.8bn in 2012-13, with more increases expected in the coming years. This increase is nearly all due to the troubled clean-up of the Sellafield nuclear facility in Cumbria.

[www.independent.co.uk/news/uk/politics/sellafield-nuclear-cleanup-bill-will-soar-by-billions-9716610.html](http://www.independent.co.uk/news/uk/politics/sellafield-nuclear-cleanup-bill-will-soar-by-billions-9716610.html)

## 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](http://www.wiseinternational.org)

### Subscriptions:

US and Canada based readers should contact NIRS for details on how to receive the Nuclear Monitor ([nirsnet@nirs.org](mailto:nirsnet@nirs.org)).

All others receive the Nuclear Monitor through WISE.

Version	NGO's/ individuals	Institutions/ Industry
Paper 20x	100 Euro	350 Euro
Email/Pdf 20x	50 Euro	200 Euro

### Contact us via:

WISE International

PO Box 59636, 1040 LC Amsterdam, The Netherlands

**Web:** [www.wiseinternational.org](http://www.wiseinternational.org)

**Email:** [info@wiseinternational.org](mailto:info@wiseinternational.org)

**Phone:** +31 20 6126368

**ISSN:** 1570-4629

# WISE/NIRS NUCLEAR

## MONITOR

c/o WISE Amsterdam  
PO Box 50636  
1040 LC Amsterdam  
Netherlands

PRINTED MATTER  
MATERIE IMPRIMEE



TPG Post

Port betaald