

NUCLEAR MONITOR

October 15, 2015 | No. 812

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:

- A call-out for coordinated international campaigning to mark next year's fifth anniversary of Fukushima and 30th anniversary of Chernobyl.
- A request to support anti-nuclear activists in Ukraine being targeted by state utility Energoatom.
- We update the ongoing problems with EPR reactors in Europe.
- We summarise an important new Greenpeace report on the growth and potential of renewable energy, and an upbeat International Energy Agency report about the medium-term growth of renewables.
- Kumar Sundaram writes about the troubled Koodankulam reactor in India.
- Michael Mariotte writes about the growing recognition of the mainstream U.S. media that nuclear power is an expensive dud and that renewables are a better option.
- Dr Ian Fairlie writes about the connection between radioactive spikes from nuclear plants and childhood leukemia.
- We summarize an alarming situation in Missouri, USA, where an underground fire has encroached to within a few hundred metres of a radioactive waste dump.

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

2016: A special year for anti-nuclear campaigns

The year 2016 will be special for all those fighting anti-nuclear campaigns. The 11th of March will be the fifth anniversary of the Fukushima disaster, and the 26th of April will be the 30th anniversary of the Chernobyl disaster.

Many groups and people are already preparing activities, publications and actions to mark these anniversaries. We invite artists, journalists, teachers, photographers, musicians, scientists, researchers, filmmakers, politicians, activists and concerned citizens to share with us their ideas and plans. We will start working on the best possible overview of what will be happening around the world.



Monitored this issue:

EPR fiasco unravelling in France and the UK	1
Renewable energy revolution	2
Koodankulam nuclear plant in India is not working	4
Mainstreaming the nuclear exit	6
Radioactive spikes from nuclear plants – a likely cause of childhood leukemia	7
Fire threatens radioactive dump in Missouri, USA	8



Fukushima Daiichi

We hope to help activists and local organizers by bringing ideas and networks together. If for instance a group in France invites a speaker from Japan and we know a group in the UK also wants to have a Japanese speaker, we hope to be able to connect the dots and improve efficiency and make best use of limited resources.

Please share with us your ideas, questions, requests and plans.

– Peer de Rijk, Director WISE

email: info@wiseinternational.org

mobile: + 31 6 20 000 626

ph: + 31 20 612 63 68

web: www.wiseinternational.org

EPR fiasco unravelling in France and the UK

NM812.4501. French utility EDF has once again pushed back the estimated start-up date and upped the cost estimate of the European Pressurized Reactor (EPR) under construction at Flamanville, France. There was no attempt to sugar-coat the fiasco by the World Nuclear Association, which noted that the estimated cost has more than tripled – from €3.3 billion (US\$3.7b) to €10.5 billion (US\$11.8b) – and the estimated six-year construction timeline has nearly doubled to 11 years.¹

Concerns were revealed earlier this year about the structural integrity of pressure vessels in EPRs under construction in France and China. WISE-Paris has released a briefing on the problems.² Drawing on information from the French Nuclear Safety Authority (ASN) and its technical support organisation, the Institute for Radiation Protection and Nuclear Safety (IRSN), WISE-Paris states:

“Available analysis released by the French nuclear safety authorities confirms the serious and exceptional nature of the defect found on the head and bottom of the reactor pressure vessel (RPV) of the EPR reactor at Flamanville, in France, and most probably those of Taishan 1 and 2 in China. All three units are under construction.

This defect consists in a “major positive segregation”, which describes an area where the carbon concentration is found to be higher than the limit expected and requested under technical specifications in the steel that was used for fabrication. The excess in carbon reaches up to 50% higher levels than expected in the affected area, which covers more than one meter in diameter and spreads through more than half of the head thickness. This appears to be much higher in scope than any other known segregation on similar components within the French operating nuclear fleet.

The mechanical properties will be affected in the segregated area, which could therefore jeopardize the possibility to exclude with certainty the risk of RPV rupture in some operational conditions. This certainty is one of the fundamentals of the reactor’s safety assessment.

The presence of the segregated zone results from the choice that Areva made regarding the forging process of the concerned components by its daughter company Creusot Forges. The analysis shows that another process, which has been used by Japan Steel Works (JSW) to forge similar components for the EPR reactor under construction in Finland, would most likely have allowed to avoid such segregations. In the case of the bottom, which is a little less thick than the head, it also appears that yet another process (directed solidification ingot), which is used by Creusot Forges for other pieces, could have been used to avoid the problem.

According to the analysis of the French Nuclear Safety Authority (ASN) and its technical support organisation, the Institute for Radiation Protection and Nuclear Safety (IRSN), Areva therefore chose, contrary to regulatory guidelines, a fabrication process which had not received technical qualification beforehand and which did not use

the best available technology. ASN says that it warned Areva on various occasions against the industrial risk that it took when proceeding with fabrication despite those concerns. Moreover, according to the same analysis, Areva’s technical assessment of the risk and characterization of a segregated zone forming in the pieces was wrong.

While there is no indication of any dissimulation at this stage, the reasons why the parts could be forged in 2006-2007, welded with other components of the RPV, and why this RPV could be received by the operator EDF, installed in the reactor building and welded with other components of the primary circuit in 2014, without any stop-point of any sort, remain to be understood. ...

The programme of studies and tests that Areva proposed is expected to deliver its results in the first half of 2016, allowing for the Advisory Group to discuss them by mid-2016 at the earliest. ASN could therefore not make its final decision about the acceptability of the RPV before the second half of 2016, even if the study and testing results were conclusive.”

If remedial action is required, it could be extremely expensive and time-consuming. The pressure vessel problems could kill the Flamanville project and destroy Areva’s already bleak chances of securing further overseas orders for EPRs.

UK EPR

Pierre-Franck Chevet, head of ASN, said the two EPRs planned for Hinkley Point in the UK could be affected as pressure vessels for those reactors have already been manufactured using the same techniques.³

Delays with the Flamanville EPR – arising from the pressure vessel fiasco, or any of the other fiascos that have plagued the project, or any fiascos that have yet to emerge – could directly impact the planned EPRs at Hinkley Point. The European Commission’s conditional support⁴ for the extraordinary subsidies on offer from the UK government to get the project moving are subject to a legal challenge launched by Austria and others. Moreover, the EC ruling was conditional, and one of the conditions is that if the Flamanville reactor is not operational by the end of 2020, the UK government’s financial guarantees become invalid. The complexities of the arrangement were recently explained by Oliver Tickell in *The Ecologist*.⁵ The EC noted that its conditions were intended to ensure that shareholders and not the guarantor (British taxpayers) “retain the principal exposure to the viability of the EPR technology until such time as there is objective evidence for confidence through the success of precedent projects such as Flamanville 3 and Taishan 1.”

The UK government is still trying to rescue the Hinkley Point project despite a growing chorus of criticism. British utilities pulled out of the project long ago. The capacity of French utilities EDF and Areva to fund the project is constrained by Areva’s massive debts (and a

restructure which will likely see EDF take on some of Areva's risks and liabilities).

The two Chinese utilities with a stake in the project – China National Nuclear Corporation (CNNC) and China General Nuclear Power Corporation (CGN) – seem to be reluctant to increase their stake in the project. The Chinese are playing hard-ball: their asks include options for Chinese involvement in planned reactors at other sites in the UK (Bradwell and Sizewell are the two sites mentioned in media reports), and some sort of agreement for the UK to consider licensing Chinese reactor technology in the UK (e.g. the Hualong One design⁶).

The Guardian newspaper opined: “In short, the Chinese have [UK Chancellor George] Osborne over a barrel. One wonders what other incentives have been offered to avoid a humiliating U-turn on Hinkley. The final deal, assuming it is agreed, should be published in full: and parliament should comb every line.”⁷

EDF hopes to sign an agreement with the Chinese utilities while Chinese President Xi Jinping is in the UK from October 20–23. But if any agreement is signed, much of the detail will be missing and it would not amount to a formal, binding agreement to proceed.⁸

A chorus of criticism

The Hinkley EPR project is now under sustained attack – and not just from the traditional anti-nuclear voices.^{9,10} The project is opposed by British Establishment figures such as Lord Turnbull (former head of the UK civil service), Lord Lawson (former Chancellor), Lord Howell (former Energy Secretary), and London Mayor Boris Johnson. It is also opposed by most of the mainstream and conservative UK newspapers.

Increasingly, nuclear power advocates are voicing outright opposition. Lady Barbara Judge, former chair of the UK Atomic Energy Authority, said the project is too expensive and uses unreliable technology.¹¹ Vocal nuclear advocates George Monbiot, Mark Lynas



and Chris Goodall say that the Hinkley project is an overpriced white elephant and should be abandoned in favour of “other low carbon technologies, both renewable and nuclear.”¹²

Bipartisan support for Hinkley may soon be a thing of the past. The Opposition Labour Party's new Shadow Secretary of State for Energy and Climate Change, Lisa Nandy, wrote to the Public Accounts Committee in late September calling for an investigation into the Hinkley project. Nandy said: “I have serious concerns about the value for money this deal provides for bill payers, the likely impact of such a deal on the most vulnerable in society, and have serious questions about the bid process itself.”¹³

Two credit ratings agencies have warned EDF and its Chinese partners that they face rating downgrades if they press ahead with Hinkley Point. Moody's said the project would have a “credit negative effect” because of the risk of large cost overruns and delays. Standard & Poor's warned of the impact on EDF's balance sheet of the Hinkley project.¹⁴

(Written by Nuclear Monitor editor Jim Green.)

References:

1. World Nuclear News, 3 Sept 2015, 'Flamanville EPR timetable and costs revised', www.world-nuclear-news.org/NN-Flamanville-EPR-timetable-and-costs-revised-0309154.html
2. WISE Paris Briefing, 1 Oct 2015, 'EPR Flamanville 3: Justification Case of the Pressure Vessel', www.dropbox.com/ll/s/lg10Xgg8YAPm3ckhDHUgjq
See also the EnerWebWatch website which has numerous documents regarding flaws with EPR pressure vessels: www.enerwebwatch.eu/EPR-t44.html
3. John Lichfield, 18 April 2015, 'UK nuclear strategy faces meltdown as faults are found in identical French project', www.independent.co.uk/news/uk/home-news/uk-nuclear-strategy-faces-meltdown-as-faults-are-found-in-identical-french-project-10186163.html
4. http://ec.europa.eu/competition/state_aid/cases/251157/251157_1615983_2292_4.pdf
5. Oliver Tickell, 2 Oct 2015, 'Flamanville nuclear safety fail sounds death knell for Hinkley C', www.theecologist.org/News/news_analysis/2985650/flamanville_nuclear_safety_fail_sounds_death_knell_for_hinkley_c.html
6. www.stophinkley.org/PressReleases/pr150922China_File.pdf
7. 27 Sept 2015, 'Hinkley Point: what price avoiding humiliation?', www.theguardian.com/business/2015/sep/27/hinkley-point-what-price-avoiding-humiliation
8. Reuters, 2 Oct 2015, 'China president's UK visit is chance for EDF to clinch Hinkley Point deal', www.dailymail.co.uk/wires/reuters/article-3257301/China-presidents-UK-visit-chance-EDF-clinch-Hinkley-Point-deal.html
9. nuClear news No.78, October 2015, 'The Hinkley Saga is a National Embarrassment', www.no2nuclearpower.org.uk/nuclearnews/NuClearNewsNo78.pdf
10. Ian Fairlie, 21 Sept 2015, '30 Media Comments Opposing Hinkley C', www.ianfairlie.org/news/21-media-comments-opposing-hinkley-c/
11. Infrastructure Intelligence, 25 Sept 2015, www.infrastructureintelligence.com/article/sep-2015/french-nucleartechology-too-expensiveand-unproven-says-iod-boss
12. George Monbiot, Mark Lynas, and Chris Goodall, 19 Sept 2015, 'We are pro-nuclear, but Hinkley C must be scrapped', www.theguardian.com/environment/2015/sep/18/we-are-pro-nuclear-but-hinkley-c-must-be-scrapped
13. Lisa Nandy, 28 Sept 2015, 'We need an investigation into Osborne's plans for nuclear power stations', <http://labourlist.org/2015/09/we-need-an-investigation-into-osbornes-plans-for-nuclear-power-stations/>
14. Robin Pagnamenta, 3 Oct 2015, 'EDF faces threat of credit downgrade over Hinkley Point' www.thetimes.co.uk/tto/business/industries/utilities/article4574734.ece

Renewable energy revolution

NM812.4502. Greenpeace has released the latest edition of its Energy [R]evolution series, first produced in 2005. The 364-page report has been produced by numerous experts and institutions.¹

The Energy [R]evolution reports have an impressive track record. Energy consulting firm Meister Consultants Group noted in March 2015: “Over the past 15 years, a number of predictions – by the International Energy Agency, the US Energy Information Administration, and others – have been made about the future of renewable energy growth. Almost every one of these predictions has underestimated the scale of actual growth experienced by the wind and solar markets. Only the most aggressive growth projections, such as Greenpeace’s Energy [R]evolution scenarios, have been close to accurate.”²

The Energy [R]evolution provides mid-term projections but the focus of the report is much more ambitious and much less certain – mapping out a pathway to 100% renewable energy by 2050.

The report proposes a phase-out of fossil fuels starting with lignite by 2035, followed by coal (2045), then oil and then finally gas (2050). As with fossil fuels, nuclear power is also phased out “as fast as technically and economically possible”.

The report details the extraordinary growth of renewables over the past decade, with 783 GW of new renewable power generation capacity installed from 2005 to 2014. However “the overall transition away from fossil and nuclear fuels to renewables is far too slow to combat dangerous climate change.” Over the past decade almost as much new coal capacity (750 GW) has been installed as renewables.

Hence the need for coordinated plans and political commitment to rapidly replace dirty energy sources with renewables. Under the Energy [R]evolution scenario, the world would stay within the IPCC’s 1,000 gigatonne “carbon budget” – total carbon emissions between 2012 and 2050 would be 744 gigatonnes in the Energy [R]evolution scenario and 667 gigatonnes in an ‘Advanced’ Energy [R]evolution scenario. The report envisages global emissions peaking at the end of this decade, a return to 1990 levels in 2030, a 60% reduction by 2040 and near-zero emissions in 2050 (excluding some non-energy sectors such as steel production).

Electricity

In the electricity sector, demand should be constrained by energy efficiency measures but even so there will be growing demand because of the electrification of transport and the need to generate synthetic fuels to replace fossil fuels.

The share of electricity generated by renewables doubles from 21% to 42% by 2030 under the Energy [R]evolution scenario, then expands to 72% in 2040 and 100% in 2050. Measures proposed to incorporate fluctuating power sources into reliable electricity systems include smart grids, demand side management, and energy storage.

	2012 capacity (GW)	Greenpeace 2050 Energy [R]evolution (GW)	Greenpeace 2050 Advanced Energy [R]evolution (GW)
Hydro	1099	1503	1536
Biomass	87	746	742
Wind	277	5,575	8,040
Geothermal	11	485	708
Solar PV	97	6,745	9,295
Concentrating solar power	3	1,473	2,555
Ocean	0	552	738
TOTAL	1,575	17,079	23,614

Heating and transport

Renewables meet around 21% of current global energy demand for heating – almost all of it biomass. In the Energy [R]evolution scenarios, energy efficiency measures reduce growing demand for heating by 33% in 2050, with the use of fossil fuels for heating replaced by a portfolio of renewable heating (solar collectors, geothermal, renewable energy-produced hydrogen) and biomass.

Decarbonising transport can largely be achieved by growing and electrifying public transport systems, as well as encouraging the uptake of ever-improving electric vehicles. Aviation and shipping are particularly difficult, but planes and ships could be powered using biofuels, hydrogen and synthetic fuels produced using electricity. Under the Energy [R]evolution scenario, just over half of road transport energy demand is met by electricity by 2050.

Jobs and costs

At every stage in the transition to 100% renewable energy, there are more energy sector jobs. The number rises from 29 million now to 48 million jobs in 2030. Solar PV would provide 9.7 million jobs by 2030, equal to the number of people working in the coal industry today. Jobs in wind power would grow to over 7.8 million, which is twice as many as are employed in oil and gas today

In the Energy [R]evolution scenario, US\$48 trillion in investments is largely offset by US\$39 trillion in fuel cost savings. In the Advanced Energy [R]evolution scenario, US\$64.6 trillion in investments is mostly offset by US\$42 trillion in fuel cost savings.

International Energy Agency report

The International Energy Agency (IEA) has released its ‘Renewable Energy Medium-Term Market Report’.³ The report notes that renewable electricity expanded at its fastest rate to date (130 GW) in 2014 and accounted for more than 45% of net additions to world capacity in the power sector.

Further, the IEA projects 700 GW of new renewable power capacity from 2015–2020, and that renewables will account for almost two-thirds of new power generation capacity over that period. The renewable share of generation is projected to rise from 22% in 2013 to over 26% in 2020.

The IEA report states that global average costs for onshore wind generation fell by 30% from 2010–2015, and are expected to decline a further 10% by 2020. Utility-scale solar PV fell two-thirds in cost and is expected to decline another 25% by 2020.

The IEA report states that renewables are not a “luxury” that only rich countries can afford. The report states that “the geography of deployment will increasingly shift to emerging economies and developing countries, which will make up two-thirds of the renewable electricity expansion to 2020. China alone will account for nearly 40% of total renewable power capacity growth and requires almost one-third of new investment to 2020.”

Another report recently released by the IEA noted that renewable electricity generation has overtaken gas to become the second largest source of electricity

worldwide, behind only coal. Renewables produced 22% of total electricity or 5,130 terawatt-hours (TWh) in 2013, more than double nuclear power’s output of 2,359 TWh.⁴

Meanwhile, the Energy Watch Group has released a report detailing the IEA’s track record of grossly underestimating the growth of renewables.⁵ For example:

- in 2010 the IEA projected 180 GW of solar PV capacity by the year 2024 but that figure was reached in January 2015.
- the IEA’s 2002 projection for wind power capacity in the year 2030 was actually reached 20 years earlier, in 2010.
- the IEA’s 2010 projection of renewable energy’s share of global electricity generation in 2035 has already been reached ... 20 years earlier!

(Written by Nuclear Monitor editor Jim Green.)

References:

1. Greenpeace International, September 2015, ‘Energy [R]evolution: A sustainable world energy outlook 2015’, www.greenpeace.org/international/en/publications/Campaign-reports/Climate-Reports/Energy-Revolution-2015/
2. Meister Consultants Group, 16 march 2015, Renewable Energy Revolution, www.mc-group.com/the-renewable-energy-revolution/
3. International Energy Agency, Oct 2015, ‘Renewable Energy Medium-Term Market Report’, www.iea.org/Textbase/npsum/MTRenew2015sum.pdf
4. IEA, ‘Electricity Information 2015’, www.iea.org/bookshop/666-Electricity_Information_2015
Free excerpt: www.iea.org/publications/freepublications/publication/Electricitytrends.pdf
Media release: www.iea.org/newsroomandevents/news/2015/august/renewable-electricity-generation-climbs-to-second-place-after-coal.html
5. Matthieu Metayer, Christian Breyer and Hans-Josef Fell, 2015, ‘The projections for the future and quality in the past of the World Energy Outlook for solar PV and other renewable energy technologies’, http://energywatchgroup.org/wp-content/uploads/2015/09/EWG_WEO-Study_2015.pdf

Please support activists in Ukraine

On September 28 activists from the National Ecological Center of Ukraine appeared at the second hearing of a defamation action brought against them by state nuclear utility Energoatom.

The issue: a May 2015 press release from NECU that charged that Energoatom’s South Ukraine #2 reactor does not meet safety standards. The nuclear utility wants NECU to retract the release and publish a statement on its website that some of the information in it was false. Except that the #2 reactor in fact does not meet safety standards. In April, Ukraine’s regulatory body reported that the 30 year-old reactor has 41 deviations from the safety rules and refused to allow it to restart. Its restart would only be considered once all required measures and safety upgrades are completed.

Important decisions on reactor lifetime extensions are looming. In 2013, the UN Espoo monitoring body ruled that the extension of licenses for two reactors at the Rivne nuclear power plant is in breach with the convention because it was done without an environmental impact assessment and without informing neighbouring countries about the plans.

Civil society groups in five EU countries have joined the campaign to demand citizens in Ukraine’s neighbourhood are fully informed about the potential transboundary implications of reactor lifetime extension plans and have

a say in the process. In July 2015, 25 Members of the European Parliament signed a letter to Euratom and the EBRD asking them to suspend loans for Ukraine’s reactor upgrade programme until the country complies with relevant international legal obligations.

Iryna Holovko, NECU and CEE Bankwatch Network campaigner in Ukraine, said: “If Energoatom is concerned about its reputation it would be wiser to directly engage with the public on its plans and their long term implications rather than trying to stifle civil society critique.”

Please sign up for information updates and action updates at <http://bankwatch.org/nucleartruth> – and encourage others to sign up.

Please also support NECU via its Facebook page. This shortcut will take you there: <http://tinyurl.com/support-NECU>

For more information contact:

*Iryna Holovko
NECU / CEE Bankwatch Network
iryna@bankwatch.org
Tel.+380 50 647 6700*

More information on nuclear power in Ukraine:

<http://bankwatch.org/our-work/projects/nuclear-power-plant-safety-upgrades-ukraine>

Koodankulam nuclear plant in India is not working

Author: Kumar Sundaram – researcher associated with the Coalition for Nuclear Disarmament and Peace (CNDP) pksundaram@gmail.com

NM812.4503. The Russian-imported nuclear power plant on the southern tip of India was an issue of fierce contention for more than three years since mid-2011. While the government and nuclear-backers scrambled to prove that there is nothing more important and urgent than the power for solving the energy crisis in Tamil Nadu and other southern states, the local people, concerned activists and independent experts differed vehemently.

India's sole and public sector nuclear operator, the NPCIL, recently announced a delay in the restart of Koodankulam #1, which has been shut down for "annual maintenance" since June 26 this year.¹ The plant was supposed to go online on August 22 but the re-start was delayed and September 23 was declared as the next date. As the new date approached, we were informed of yet another delay.

Since its was commissioned, for most of the time Koodankulam #1 has been shut down either for "routine maintenance" or has tripped and shut down leaving the plant authorities red-faced. The reactor was commissioned on 22 October 2013 but it took a prolonged period of tests to attain functioning at 100% capacity and was declared commercially operational only on 31 December 2014. During that test-period of 14 months, the reactor saw 19 'shut down due to tripping' and three maintenance outages. In fact NPCIL resorted to a rather hurried declaration of commercial operation as the unending test-period started feeling like an embarrassment for it and the then government.

While some tripping does happen in nuclear reactors undergoing tests, with Koodankulam such occurrences are exceptionally high. With 14 trips during 4701 hours of its operation, the rate for KKNPP is 20.8 per year. The World Nuclear Association (WNA) report on capacity optimization mentions an average global tripping rate per year of 0.37 for all the reactors in the world.²

This pattern of repeated shut-downs and closures for prolonged "routine maintenance" and the postponements of restart dates should bring home the seriousness of the problem and the government must constitute a high-level and independent probe into the white elephant that Koodankulam has become. It is important not only to assess the problems in the plant and find possible corrective measures to ensure that risks do not escalate, but also to reconsider planned new nuclear projects in light of the failure of Koodankulam.

The Congress government ignored informed voices and bulldozed grassroots protests

In its zeal to push for the project, the erstwhile Congress government disregarded cautionary notes from eminent independent scientists³ and the former nuclear regulator⁴ of India. These concerns were related to a scandal

which happened in Russia between 2007 and 2011, involving supply of sub-standard equipment for which one of the Directors of the Zio-Podolsk company was imprisoned. Equipment from the same batch were used by Atomsroyexport in Koodankulam as well and the experts warned that this would lead to complications, inefficiency and would even have potentially dangerous safety implications. The former union power secretary of India also wrote to then Prime Minister Manmohan Singh raising the issue and advising him not to go ahead with the hurried commissioning of Koodankulam.

But the Singh government had made nuclear an ego issue that blinded it from all prudence and inconvenient truths. Protests against the reactor from local communities were based on their legitimate safety and livelihood concerns. The other important part was the dissent of social activists on ecological concerns, liability issues and the democratic rights of the local community to decide its development. But besides bulldozing these two set of arguments with brutal repression and stigmatization of activists as 'foreign hand', the Manmohan Singh government also turned a deaf ear to a more informed group of people who knew the gravity of the situation. The independent voices that cautioned about faulty equipment stand vindicated.

In Tamil Nadu, the government's PR machinery had also propped up orchestrated protests of a handful of agitated people angry at the delay in commissioning of protests, claiming the coming summer that year would be unbearable without the nuclear reactor. Now those folks⁵ are nowhere to be seen demanding answers from the NPCIL about why it has repeatedly failed to ensure smooth functioning of the reactor. Politicians like Jaya Lalitha, and non-Congress parties like the CPI(M) which eventually supported the Koodankulam project on the assurances of official scientists and the government of India, are not questioning them either. While the issue could earn BJP some brownie points against the Congress, it seems to be avoiding it both because it also supports nuclear energy in principle and because Modi's global nuclear shopping spree⁶ would be open to question if the ill-considered imported reactor project gets publicized.

Hard questions also need to be asked of the then Minister of State, Mr. Narayanaswamy, who claimed that protests resulted in losses of Rs. 5 crores per day by forcing a delay in the commissioning of Koodankulam #1. While the Tamil Nadu government did order a halt on the construction work for a few months, at no point did the court give a stay, and agitators did not block the construction or later the functioning of the reactor in any way. So who is now responsible for the loss to exchequer by these repeated delays and the huge opportunity costs for not looking into the cautions raised? The delays in Koodankulam didn't start with the

announcement of commissioning. There were repeated delays in the date of commissioning itself and Mr. Narayanaswamy's repeated assurances⁷ of the reactor starting in next 15 days had become a laughing stock.

It's too dangerous to allow the Koodankulam issue to fade as it doesn't suit the dominant interests that shape the public gaze in India. It concerns the safety of Indian citizens, larger public policy on an issue of national importance and the emptiness of promises that were made to sell the expensive and dangerous project.

References:

1. www.newindianexpress.com/nation/Koodankulam-N-plant-Shut-Down-for-Annual-Maintenance/2015/06/24/article2884073.ece
2. www.world-nuclear.org/uploadedFiles/org/WNA/Publications/Working_Group_Reports/REPORT_OptimizCapacity.pdf
3. www.dianuke.org/indias-top-60-scientists-question-koodankulam-safety/
4. www.dianuke.org/serious-flaws-in-koodankulam-plant-dr-a-gopalakrishnan/
5. www.thehindu.com/todays-paper/tp-national/tp-tamilnadu/small-and-tiny-industries-suspend-work-see-commissioning-of-kknpp/article2733939.ece
6. www.dianuke.org/as-modi-visits-france-for-nuclear-shopping-same-design-in-france-found-seriously-defective-by-the-regulator/
7. www.dianuke.org/v-narayanasamy-a-failed-astrologer-in-the-pmo/

Mainstreaming the nuclear exit

Author: *Michael Mariotte – President of the Nuclear Information & Resource Service*

NM812.4504. It's no great revelation to say that the mainstream media, fractured though it may be these days, holds great power. It's not direct power; the media can't make actual decisions. Rather, the media grabs a theme – a meme if you want – and holds on to it, and repeats it, and provides slight twists to it so it can be repeated again, until it becomes accepted wisdom. While the media, especially the mainstream media, is often behind the curve, behind reality, once it catches up and snares and spreads that meme, it doesn't take long for it to establish itself. And once a concept becomes accepted wisdom, then the actual decisions tend to follow in unison. As a group, politicians rarely stray far from accepted wisdom.

For many years, from the 1950s through the '70s, the accepted wisdom was that nuclear power was safe, advanced, and a great asset to society. Then reality crashed the party with Three Mile Island and the nation's most trusted person Walter Cronkite's terrifying (although incorrect) statement that radiation was coming through the walls of the containment building, and the accepted wisdom began to turn away from nuclear power; Chernobyl was too distant in both distance and political structure to end the industry entirely, but it was icing on the cake. And thus nuclear power began a period of decline that reached a nadir in 2000 when there was not a single reactor under construction anywhere in the western world.

But then, the media – which loves a man bites dog story – latched onto the idea pitched by nuclear PR flacks and backed by a couple dozen (in retrospect, mostly bogus) construction application licenses, that a nuclear “renaissance” was in full swing. Once again, nuclear was not only acceptable, it was a preferred energy source, free of carbon emissions. That notion – and forced payment from ratepayers by Public Service Commissions more supportive of industry than those same ratepayers – was enough to get the construction cranes set up at Vogtle and Summer at least. Limited reactor construction also resumed in Europe, and China joined the pack too.

Reality showed its cruel face again, however, as costs for those reactors spiraled upward and construction schedules indicated that for each month of construction, the utilities gained nothing – they were still the same amount of months away from completion. Adding to the crush of the “renaissance” was Fukushima, which brought the legitimate fears of the nuclear age to a new generation.

While the “renaissance” fizzled, at least the industry could take comfort in the fact that it could continue to rely on, and make money from, its large number of paid-off reactors. Except as those reactors aged and as they confronted new costs from required Fukushima-related upgrades (although those have been extremely modest, especially in the U.S.), their operating and maintenance costs increased. Even more importantly, the costs of competing electricity generation sources plummeted at the same time. The result was an ever-increasing number of existing reactors are either now losing money or on the verge of doing so.

And the mainstream media has finally picked up on that reality: that it's not just that nuclear reactors have safety issues and radioactive waste problems and the like but that nuclear power can no longer compete with the alternatives. Moreover, the changes in energy costs that cause that reality are not only making nuclear power obsolete, they are making the entire utility system and its reliance on baseload power obsolete. And the more that reality is repeated and becomes accepted wisdom, the more real decisions reflect that.

Thus, you get the EPA's Clean Power Plan dropping its intent to prop up existing reactors. The EPA's Gina McCarthy may still be giving lip service to the nuclear industry¹, but where it counted the EPA did what clean energy advocates wanted, not the nuclear industry.

That's one example of a real decision.

So was the Washington DC Public Service Commission's scuttling of the proposed Exelon takeover of Pepco. Behind that decision was sincere concern both about Exelon's reliance on a failing fleet of nuclear

reactors and its hostility to renewables. Exelon is now trying to sweeten the deal² but what it doesn't seem to understand is that its roadblock is Exelon itself – perhaps the epitome of the utility of the past.

Recently there have been a plethora of articles picking up the same theme: alternatives to nuclear are cheaper than existing reactors, and that means big changes ahead for the entire utility industry.

Consider this passage from an article in *U.S. News*, once the most staid and Republican of the three big weekly news-magazines: “Cheap natural gas, together with plummeting prices for wind and solar, has upended the energy sector – not only making nuclear plants' huge upfront costs, endless regulatory approvals and years-long construction especially prohibitive, but undercutting the very idea of a centralized power system.”³

That's exactly the kind of sentence that sparks nightmares in utility suites, especially those most dependent on nuclear and coal power.

The previous accepted wisdom, that if nothing else nuclear reactors are “carbon-free” or nearly so, and that closing them would mean giving up on fighting climate change, is also beginning to bow to reality. Because while cheap and dirty gas is indeed a competitor today, in the longer run (and not much longer), the real competition is clean renewables.

A piece from *Politico* – about as mainstream as it gets – focused on the perspective of a UBS analyst on Entergy's troubled Fitzpatrick and Ginna reactors. Consider how this article ended:

“The loss of the Ginna plant alone could drive the state's air emissions up 7 percent, that earlier analysis found. Losing another plant, or possibly two, will make it harder to meet tough new federal pollution standards. However,

to offset the loss of New York's nuclear facilities, the state could place increasing emphasis on growing the renewable industry. ‘If retirements move forward as contemplated, we see a real corresponding uplift to the renewable industry as this becomes the growing source of ‘plugging’ for any further holes in meeting prospective carbon targets,’ he wrote.”⁴

In other words, we don't need to worry that carbon reduction goals can't be met if reactors like Ginna close. Renewables will take their place, and will do so quickly. Indeed, the shutdown of reactors actually opens up the market for a deluge of new renewables.

There were other articles with a similar bent – one from *Motley Fool*, for example. The mainstream media have finally caught on. It's not just *GreenWorld* and a few other clean energy blogs anymore. Nuclear power can't compete. Moreover, there is no downside to that. In fact, it's all upside. Closing reactors will hasten the clean energy future and the transformation of electric utilities generally.

The long-sought phase-out of nuclear power began in 2013. It's taken a short break since then, but it's about to resume (indeed it *has* resumed with Entergy's October 13 announcement that the single-reactor Pilgrim plant in Massachusetts will close by mid - 2019). Over the next 18 months or so, state legislatures and regulatory bodies will be making decisions about bailing out a host of troubled reactors. But for the nuclear industry, those decisions are coming too late. Their timing couldn't be much worse. It's not just that bailing out big baseload reactors (and old coal plants for that matter) no longer makes economic sense, it's that the very existence of those obsolete reactors stands in the way of clean energy expansion. Understanding that, and for politicians knowing that it is accepted wisdom, makes the decisions very easy.

References:

1. www.nei.org/News-Media/News/News-Archives/EPA-Chief-Reiterates-Clean-Power-Plan-Needs-Nuclear
2. www.bizjournals.com/baltimore/news/2015/09/25/exelon-to-refile-bid-to-acquire-pepco.html
3. www.usnews.com/news/special-reports/the-manhattan-project/articles/2015/09/28/the-20-percenters-nuclear-energy-faces-reality-and-its-likely-decline
4. www.capitalnewyork.com/article/albany/2015/09/8577897/analyst-tighter-emissions-goals-wont-save-ny-nuclear-industry

Radioactive spikes from nuclear plants – a likely cause of childhood leukemia

Author: *Ian Fairlie*

When nuclear reactors are refueled, a 12-hour spike in radioactive emissions exposes local people to levels of radioactivity up to 500 times greater than during normal operation, writes Ian Fairlie. The spikes may explain infant leukemia increases near nuclear plants – but operators provide no warnings and take no measures to reduce exposures.

NM812.4505. Nuclear operators should inform local people when they intend to open up their reactors, and they should only do so at night-time and when the winds are blowing out to sea.

On 23rd August, *The Ecologist* published very clear evidence of increased cancers among children living near nuclear power stations around the world, including the

UK.¹ The story sparked much interest on social media sites, and perhaps more importantly, the article's scientific basis (published in the academic peer-reviewed scientific journal the *Journal of Environmental Radioactivity*) was downloaded over 500 times by scientists.²

Given this level of interest and the fact that the UK government is still pressing ahead with its bizarre plans

for more nuclear stations, we return to this matter – and examine in more detail an important aspect which has hitherto received little attention: massive spikes in radioactive emissions from nuclear reactors.

Refueling releases a huge radioactive emissions plume

Operating nuclear power plants (NPPs) contain large volumes of radioactive gases at high pressures and temperatures. When their reactors are depressurised and opened to refuel every 12-18 months, these gases escape creating a spiked emission and a large radioactive plume downwind of the station lasting for 12 hours or so.

However the emissions and plumes are invisible, and no advance warning is ever given of these spikes. The public is effectively kept in the dark about them, despite their possible health dangers.

For years, I had tried to obtain data on these spikes, but ever since the start of the nuclear era back in 1956, governments and nuclear power operators have been extremely loath to divulge this data.

Only annual emissions are made public and these effectively disguise the spikes. No data is ever given on daily or hourly emissions.

Is this important? Yes: these spikes could help answer a question which has puzzled the public and radiation protection agencies for decades – the reason for the large increases in childhood leukemias near NPPs all over the world.

Governments have insisted that these increased leukemias could not be caused by radioactive emissions from NPPs as their estimated radiation doses were ~1,000 times too low. But these don't take the time patterns of radioactive emissions into account, and so are riddled with uncertainties.

500 times more radiation released than during normal operation

This situation lasted until September 2011, when the International Physicians for the Prevention of Nuclear War (IPPNW) in Germany released a press notice. For the very first time anywhere in the world, half-hourly data on releases of radioactive noble gases from an NPP were made public.³ The chart⁴ showed that the normal emission concentration (of noble gases) during the rest of the year was about 3 kBq/m³, but during refuelling on September 22 and 23 this sharply increased to ~700 kBq/m³ with a peak of 1,470 kBq/m³: in other words, a spike.

Primarily, the spike includes radioactive noble gases and hydrogen-3 (tritium) and smaller amounts of carbon-14 and iodine-131.

This data shows that NPPs emit much larger amounts of radioactive noble gases during refuelling than during normal operation in the rest of the year.

From the new data, Nuremberg physicist and statistician Dr Alfred Körblein has estimated that, at its maximum value, the concentration of noble gas emissions during refueling was 500 times greater than during normal reactor operation. He also has estimated that about two-thirds of the NPP's annual emissions occur during refuelling.

20-100 times dose increases to local populations

In May 2011 in Germany, Green MPs entered the Bavarian State Parliament (Landtag) for the first time where they formed the Government in coalition with the German Socialist Party (SPD). After several requests, the new Bavarian Government insisted that the state nuclear regulator release non-averaged data on emissions. The highly reluctant nuclear regulator was compelled to respond.

In other words, the Green MPs obtained the data because they had the political power to force its release: there is a lesson here for British environmentalists.

So could these spikes help explain leukemia increases near nuclear plants? Yes they could. People living near nuclear power stations and downwind from them will be exposed to high doses of radiation during these emissions spikes – estimated to be 20-100 times higher than from the tiny releases during the rest of the year.

In 2011, the UK National Dose Assessment Working Group published guidance on 'Short Term Releases to the Atmosphere'.⁵ This stated that "... doses from the assessment of a single realistic short-term release are a factor of about 20 greater than doses from the continuous release assessment."

An older German study indicated that these doses could be 100 times greater.⁶

A dramatic increase in individual doses

Some scientists think that the time pattern is unimportant and only the population dose is relevant, but this turns out not to be the case. The reason is partly related to the duration of the release, as short releases produce very narrow plumes (plume widths vary non-linearly as a fractional power of the duration).

The result is that individual doses increase dramatically per Bq emitted. Another reason is that spikes result in high concentrations of organically bound tritium and carbon-14 in environmental materials and humans which have longer retentions and thus higher doses.

The precise amount will depend on many factors, including source term, proximity to the reactor, wind speed, wind direction, and the diets and habits of local people.

Even before the new data, official sources didn't have a good handle on these doses to local people. Official estimates of radiation doses from NPPs already contain many uncertainties, that is, they could be many times larger than admitted.

This was shown in the 2004 CERRIE Report⁷, a UK Government Committee which showed that dose estimates from environmental releases depended on many computer models and the assumptions they contained. The new information on radioactive spikes adds to these uncertainties.

Therefore higher doses from emission spikes could go a long way to explaining the increased incidences of child leukemias near NPPs shown by the KiKK findings.⁸

‘Especially at risk are unborn children’

IPPNW Germany warned of the probable health impacts of such large emission spikes. Dr Reinhold Thiel, a member of the German IPPNW Board said:

“Especially at risk are unborn children. When reactors are open and releasing gases, pregnant women can incorporate much higher concentrations of radionuclides than at other times, mainly via respiration. Radioactive isotopes inhaled by the mother can reach the unborn child via blood with the result that the embryo/ fetus is contaminated by radioactive isotopes.

“This contamination could affect blood-forming cells in the bone marrow resulting later in leukemia. This provides a plausible explanation for the findings of the KiKK study published in 2008 that under-fives living near NPPs are considerably more at risk of cancer, particularly leukemia, than children living further away.”

In the light of the German data, it is recommended half-hourly emissions data from all UK reactors should be

disclosed and that the issue of childhood cancer increases near NPPs be re-examined by the Government.

Nuclear operators should inform local people when they intend to open up their reactors, and they should only do so at night-time (when most people are indoors) and when the winds are blowing out to sea.

Dr Ian Fairlie is an independent consultant. He has a degree in radiation biology from Bart’s Hospital in London and his doctoral studies concerned the radiological hazards of nuclear fuel reprocessing. He was formerly a UK government civil servant on radiation risks from nuclear power stations. From 2000 to 2004, he was head of the Secretariat to the UK Government’s CERRIE Committee on internal radiation risks. www.ianfairlie.org/

Reprinted from The Ecologist: www.theecologist.org/News/news_analysis/2574389/radioactive_spikes_from_nuclear_plants_a_likely_cause_of_childhood_leukemia.html

References:

1. www.theecologist.org/News/news_analysis/2525488/nuclear_power_stations_cause_childhood_leukemia_and_heres_the_proof.html
2. www.sciencedirect.com/science/article/pii/S0265931X13001811
3. www.ippnw-europe.org/?expand=707&cHash=8752881e4a
4. www.ippnw.de/commonFiles/pdfs/Atomenergie/Edelgasemissionen-Gundremmingen_engl.pdf
5. www.ndawg.org/documents/NDAWG-2-2011_000.pdf
6. Hinrichsen K, 2001, Critical appraisal of the meteorological basis used in (German) General Administrative Regulations (re dispersion coefficients for airborne releases of NPPs). See Annex D page 9: Radiation Biological Opinion. in www.strahlentex.de/_03_Hauptgutachten_Stevenson-vollstaendig.pdf (in German)
7. www.cerrie.org/
8. www.alfred-koerblein.de/cancer/english/kikk.htm

Fire threatens radioactive dump in Missouri, USA

NM812.4506. A radioactive waste dump in Missouri, USA, is under threat from an underground fire. The fire at Bridgeton Landfill, near St. Louis, is as close as 350–400 metres from the West Lake Landfill. The West Lake facility was contaminated with radioactive waste from uranium processing. The waste was illegally dumped in 1973 and includes material that dates back to the Manhattan Project.^{1,2}

The cause of the fire is unknown. It has been burning since 2010. The issue has received media attention recently because of the release of a St Louis County emergency plan.³

The emergency plan states that if the underground fire reaches the waste, “there is a potential for radioactive fallout to be released in the smoke plume and spread throughout the region.” The plan calls for evacuations and the development of emergency shelters, both in St. Louis County and neighbouring St. Charles County.

Last month, Missouri Attorney General Chris Koster said he was troubled by new reports about the site. One found radiological contamination in trees outside the landfill’s perimeter. Another showed evidence that the fire has moved past two rows of interceptor wells and

closer to the radioactive waste. Koster said the reports were evidence that Republic Services, operator of both the Bridgeton Landfill and the West Lake Landfill, “does not have this site under control.”⁴

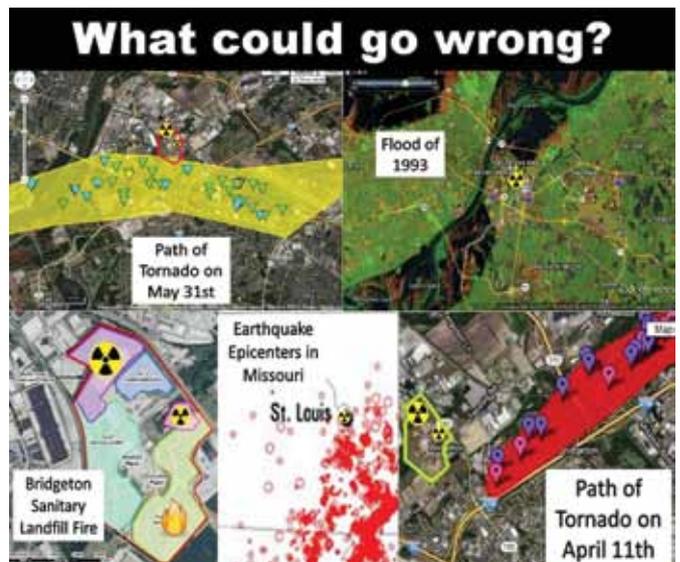
Four school districts near the radioactive West Lake Landfill recently sent letters to parents explaining their plans for a potential emergency at the site. “We remain frustrated by the situation at the landfill,” wrote Mike Fulton, superintendent of the Pattonville School District. Rhonda Marsala, a local who has two children at nearby schools, said: “We prepare our kids for tornadoes, fire drills, intruder alerts, but how do you prepare them for something like this? The fact that these young children know about it, and they have anxiety over it, it’s very unfair to them.”⁵

The state of Missouri is taking legal action against Republic Services, initiated in 2013, alleging negligent management and violation of state environmental laws. The suit is set for trial in March 2016.⁴

Missouri Coalition for the Environment wants the radioactive waste removed, saying that the EPA’s 2008 decision to “cap and leave” means the wastes will remain a constant threat to drinking water, public health, and the environment.⁶

The 'Just Moms St Louis' group wants responsibility for the site passed from the EPA to the US Army Corps of Engineers and for it to be managed under its 'Formerly Utilized Sites Remedial Action Program'.⁷ That call has also been made by St. Louis-area members of Congress and both of Missouri's U.S. senators.²

Underground smouldering is common, especially in abandoned coal mines. At least 98 underground mine fires in nine states were burning in 2013, according to the U.S. Office of Surface Mining Reclamation and Enforcement. Perhaps the most notorious was the fire that began in 1962 and burned near and beneath the town of Centralia, Pennsylvania, for more than 50 years. Only a few people remain in a town that once had 1,000 residents.¹



Graphic from Missouri Coalition for the Environment.

More information:

Missouri Coalition for the Environment: <http://moenvironment.org/program-areas/radioactive-landfill-fire-risks>

Just Moms St Louis: www.stlradwastelegacy.com/

EPA: www3.epa.gov/region07/cleanup/west_lake_landfill/index.htm

(Written by Nuclear Monitor editor Jim Green.)

References:

- 10 Oct 2015, 'Underground fire outside St. Louis has burned since 2010, nears nuclear waste dump', www.chicagotribune.com/news/nationworld/midwest/ct-st-louis-underground-fire-20151010-story.html
- Editorial Board, 10 Oct 2015, 'Editorial: Help residents near West Lake and Bridgeton landfills breathe easy', www.stltoday.com/news/editorial-help-residents-near-west-lake-and-bridgeton-landfills-breathe/article_44e99f34-a0f3-5fd5-a861-276c7e28ffa9.html
- St Louis County, Oct 2014, West Lake Landfill Shelter in Place / Evacuation Plan, https://cbsstlouis.files.wordpress.com/2015/10/3062_001.pdf
See also Kevin Killeen, 5 Oct 2015, 'St. Louis County Releases Disaster Plan for West Lake Landfill', <http://stlouis.cbslocal.com/2015/10/05/st-louis-county-releases-disaster-plan-for-west-lake-landfill/>
- Attorney General's Office, 3 Sept 2015, 'AG Koster releases new expert reports concluding radiation and other pollutants have migrated off-site at Bridgeton Landfill', www.ago.mo.gov/home/ag-koster-releases-new-expert-reports-concluding-radiation-and-other-pollutants-have-migrated-off-site-at-bridgeton-landfill
- Blythe Bernhard, Oct 2015, 'School districts prepare for West Lake Landfill emergency', www.stltoday.com/news/local/metro/school-districts-prepare-for-west-lake-landfill-emergency/article_a6effa70-f92b-584c-8a7c-cb59d85a6b38.html
- <http://moenvironment.org/program-areas/radioactive-landfill-fire-risks>
- www.stlradwastelegacy.com/our-missio/

WISE/NIRS Nuclear Monitor

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

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

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

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

Subscriptions:

US and Canada based readers should contact NIRS for details on how to receive the Nuclear Monitor (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

Email: 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