

Is nuclear power in crisis, or is it merely the END?

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NM839.4625 In the last issue of *Nuclear Monitor* we reported on the crippling debts facing nuclear industry giants¹ – French utilities EDF and Areva, Japanese conglomerate Toshiba and its US-based nuclear subsidiary Westinghouse² – and on pro-nuclear responses to the nuclear power crisis.

Is crisis too strong a word? Nuclear advocates and lobbyists are increasingly using that language. A February 22 piece in the online investment publication *Seeking Alpha* states: “The global nuclear power generation industry is in crisis. The nuclear power companies are not undertaking many new ventures while most of the projects in progress are on the rough patch.”³

Michael Shellenberger from the Breakthrough Institute has recently written articles about nuclear power’s “rapidly accelerating crisis”⁴ and the “crisis that threatens the death of nuclear energy in the West”.⁵ Environmental Progress, another pro-nuclear lobby group connected to Shellenberger, has a webpage dedicated to the

nuclear power crisis – among other things, it states that 151 gigawatts (GW) of worldwide nuclear power capacity (38% of the total) could be lost by 2030 (compared to 33 GW of retirements over the past decade), and over half of the US reactor fleet is at risk of closure by 2030.⁶

A recent article from the Breakthrough Institute and the like-minded Third Way lobby group discusses “the crisis that the nuclear industry is presently facing in developed countries” and the reasons why “the industry is on life support in the United States and other developed economies”, and asserts that “the era of building large fleets of light-water reactors is over in much of the developed world.”⁷ Another article from the same authors states that the nuclear power “crisis, at bottom, is the result of the industry’s inability to adapt to changing economic, institutional, and technological realities.”⁸

As a worldwide generalization, the nuclear power industry can’t be said to be in crisis. To take the extreme example, China’s nuclear power program isn’t in crisis – it is moving

ahead at pace. However, large parts of the industry are in crisis. The US nuclear industry is in crisis, with no likelihood of new reactors for the foreseeable future (other than the four under construction) and a very old reactor fleet. Toshiba and Westinghouse are in crisis and their attempt to establish a Japanese/US reactor construction and export industry is in tatters.

The French nuclear industry is in crisis ... its “worst situation ever” according to former EDF director Gérard Magnin.⁹ The French industry faces multiple serious problems domestically, and its EPR export ambitions are “in tatters” as *Bloomberg* noted in 2015.¹⁰ EDF and Areva would both be bankrupt if not for the largesse of the French state.

No-one would dispute that Japan’s nuclear power industry has been in crisis for the past six years, with no end in sight.

Combined, the crisis-ridden US, French and Japanese nuclear industries account for 45% of the world’s ‘operable’ nuclear reactors according to the World Nuclear Association’s database, and they accounted for 50% of nuclear power generation in 2015 (and 57% in 2010).¹¹

Countries with crisis-ridden nuclear programs or phase-out policies (e.g. Germany, Belgium, and Taiwan) account for about half of the world’s operable reactors and more than half of worldwide nuclear power generation.

The Era of Nuclear Decommissioning (END)

The aging of the global reactor fleet isn’t yet a crisis for the industry, but it is heading that way. In many countries with nuclear power, the prospects for new reactors are dim and rear-guard battles are being fought to extend the lifespans of aging reactors that are approaching or past their design date.

Perhaps the best characterization of the global nuclear industry is that a new era is approaching – the Era of Nuclear Decommissioning (END). Nuclear power’s END will entail:

- a slow decline in the number of operating reactors (unless growth in China can match the decline elsewhere);
- an increasingly unreliable and accident-prone reactor fleet as aging sets in;¹²
- countless battles over lifespan extensions for aging reactors;
- an internationalization of anti-nuclear opposition as neighboring countries object to the continued operation of aging reactors (international opposition to Belgium’s aging reactors is a case in point¹³);
- many battles over the nature and timing of decommissioning operations;
- many battles over taxpayer bailouts for companies and utilities that haven’t set aside adequate funding for decommissioning;
- more battles over proposals to impose nuclear waste repositories on unwilling or divided communities; and
- battles over taxpayer bailouts for companies and utilities that haven’t set aside adequate funding for nuclear waste disposal.

As discussed in *Nuclear Monitor #837*, nuclear power is likely to enjoy a small, short-lived upswing in the next couple of years as reactors ordered in the few years before the Fukushima disaster come online.¹⁴ Beyond that, the Era of Nuclear Decommissioning sets in, characterized by escalating battles (and escalating sticker shock) over lifespan extensions, decommissioning and nuclear waste management. In those circumstances, it will become even more difficult than it currently is for the industry to pursue new reactor projects. A positive feedback loop could take hold and then the industry will be well and truly in crisis.

Recent bad news for the nuclear industry

If nuclear power isn’t yet in crisis, it is heading that way. Just in the past month there has been a steady stream of bad news for the industry – summarized here.

Of course the most significant news over the past month was Toshiba’s February 14 announcement that it was booking a US\$6.3 billion (€5.9bn) writedown on its US nuclear subsidiary Westinghouse and exiting the reactor construction industry.¹ *Reuters* reported on March 1 that Toshiba is seeking legal advice as to whether Westinghouse should file for Chapter 11 bankruptcy.¹⁵ But even under a Chapter 11 filing, *Reuters* reported, “Toshiba could still be on the hook for up to \$7 billion in contingent liabilities as it has guaranteed Westinghouse’s contractual commitments”.

Toshiba plans to sell profitable businesses to cover the debts from Westinghouse’s multi-billion dollar cost overruns building AP1000 reactors in the US. Toshiba would likely sell Westinghouse if it could find a buyer, but even if a buyer could be found Toshiba would likely be stuck with the mounting debts from the US AP1000 projects due to contractual obligations.

Commercial operation dates for the two AP1000 reactors in Vogtle, Georgia have been pushed back by another three and six months – the new start-up dates are December 2019 and September 2020.¹⁶ Originally, completion of the reactors was scheduled for 2016 and 2017. There is plenty of scope for further delays and cost overruns. Already, the combined cost overruns for the four AP1000 reactors in the US (two each in Georgia and South Carolina) amount to about US\$11.2bn (€10.7bn).¹⁷

Georgia Power, 45.7% owner of the Vogtle AP1000 project, has suspended plans for another nuclear plant in Georgia, with more than US\$50 million of ratepayers’ money already wasted on the Stewart County project.¹⁸

The *Nikkei Asian Review* reported on February 20 that Toshiba plans to pull out of the plan for two Advanced Boiling Water Reactors at the South Texas Plant.¹⁹ The reactors were scheduled to be completed as early as 2016 but work never began and likely never will. Toshiba booked writedowns totaling 72 billion yen (US\$638 million at current rates) on the project in fiscal years 2013 and 2014.

The UK pro-nuclear lobby group New Nuclear Watch Europe said in late February that there is a danger that no new nuclear capacity will come online in the UK before 2030, and that the subsidies on offer to support new reactors are insufficient and need to be expanded.²⁰ The lobby group pointed to:

- delays with the EPR reactor in Flamanville, France and the possibility that those delays would flow on to the two planned EPR reactors at Hinkley Point in the UK;
- the lack of investors for the proposed Advanced Boiling Water Reactors at Wylfa in Wales;
- the acknowledgement by the NuGen (Toshiba/Engie) consortium that the plan for three AP1000 reactors at Moorside faces a “significant funding gap”; and
- the fact that the Hualong One technology which China General Nuclear Power Corporation hopes to deploy at Bradwell in Essex has yet to undergo its generic design assessment.

The *Financial Times* reported on March 2 that French company Engie booked a €1bn impairment on its nuclear decommissioning provisions in Belgium.²¹

The start-up dates for two EPR reactors in China's Guangdong province have been pushed back another six months.²² The project is several years behind schedule – construction began in 2009/10 and the original schedule for start-up in 2014/15 has been pushed back to 2017/18.²³

On March 1, French utility Areva posted a €665 million (US\$700m) net loss for 2016.²⁴ Losses in the preceding five years exceeded €10 billion (US\$10.5 bn).²⁵ A large majority of a €5 billion recapitalization scheduled for June will come from French taxpayers.²⁶

On February 14, French utility EDF released its financial figures for 2016: earnings fell 6.7%, revenue declined 5.1%, net income excluding non-recurring items fell 15%, and EDF's debt remained steady at €37.4 billion.²⁷ All that EDF chief executive Jean-Bernard Levy could offer was the hope that EDF would “hit the bottom of the cycle” in 2017 and rebound next year.²⁸ The French government provided EDF with €3 billion in extra capital in 2016²⁹ and will contribute €3 billion towards a €4 billion capital raising this year.^{27,28}

EDF is being forced to take over parts of its struggling sibling Areva's operations – a fate you wouldn't wish on your worst enemy. And just when it seemed that things couldn't get any worse for EDF, a fire took hold in the turbine room of one of its Flamanville reactors on February 9 and the reactor will likely be offline until late March at an estimated cost of roughly €1.2m per day.³⁰

And that's just *some* of the nuclear industry's bad news over the past month ...

References:

1. Nuclear Monitor #838, 21 Feb 2017, 'Nuclear industry for sale – renovator's dream?', www.wiseinternational.org/nuclear-monitor/838/nuclear-monitor-838-21-february-2017
2. Nuclear Monitor #838, 21 Feb 2017, 'Pro-nuclear perspectives on the nuclear industry crisis – 'an unusually grim outlook'', www.wiseinternational.org/nuclear-monitor/838/nuclear-monitor-838-21-february-2017
3. 22 Feb 2017, 'Exelon Will Survive The Nuclear Crisis', <http://seekingalpha.com/article/4048161-exelon-will-survive-nuclear-crisis>
4. Michael Shellenberger, 13 Feb 2017, 'Why its Big Bet on Westinghouse Nuclear is Bankrupting Toshiba', www.environmentalprogress.org/big-news/2017/2/13/why-its-big-bet-on-westinghouse-nuclear-bankrupted-toshiba
5. Michael Shellenberger, 17 Feb 2017, 'Nuclear Industry Must Change – Or Die', www.environmentalprogress.org/big-news/2017/2/16/nuclear-must-change-or-die
6. www.environmentalprogress.org/clean-energy-crisis
7. Josh Freed, Todd Allen, Ted Nordhaus, and Jessica Lovering, 24 Feb 2017, 'Is Nuclear Too Innovative?', <https://medium.com/third-way/is-nuclear-too-innovative-a14fb4fef41a>
8. Josh Freed, Todd Allen, Ted Nordhaus, and Jessica Lovering, 28 Feb 2017, 'Do We Need An Airbus for Nuclear?', <https://medium.com/third-way/do-we-need-an-airbus-for-nuclear-7f1d2afcea8b>
9. Adam Vaughan, 29 Nov 2016, French nuclear power in 'worst situation ever', says former EDF director, www.theguardian.com/environment/2016/nov/29/french-nuclear-power-worst-situation-ever-former-edf-director
10. Carol Matlack, 17 April 2015, 'Areva Is Costing France Plenty', www.bloomberg.com/news/articles/2015-04-16/france-s-areva-falters-in-reactor-business-leaks-cash
11. WNA, 1 March 2017, 'World Nuclear Power Reactors & Uranium Requirements', www.world-nuclear.org/information-library/facts-and-figures/world-nuclear-power-reactors-and-uranium-requireme.aspx
12. David Lochbaum, 2004, 'U.S. Nuclear Plants in the 21st Century', Union of Concerned Scientists, www.ucsusa.org/assets/documents/nuclear_power/nuclear04fnl.pdf
13. Nuclear Monitor #834, 24 Nov 2016, 'Belgium: Legal action to close Tihange 2 reactor', www.wiseinternational.org/nuclear-monitor/834/nuclear-news-nuclear-monitor-834-24-november-2016
14. 31 Jan 2017, '2016 in Review: The nuclear power renaissance – blink and you'll miss it', Nuclear Monitor #837, www.wiseinternational.org/nuclear-monitor/837/nuclear-monitor-837-31-january-2017
15. Reuters, 1 March 2017, 'Toshiba asks law firm to advise on potential Westinghouse bankruptcy cost: sources', www.reuters.com/article/us-toshiba-westinghouse-idUSKBN1684B8
16. WNN, 24 Feb 2017, 'Vogtle operation dates rescheduled', <http://world-nuclear-news.org/C-Vogtle-operation-dates-rescheduled-2402178.html>
17. 2 Feb 2017, 'Toshiba-Westinghouse: The End of New-build for the Largest Historic Nuclear Builder', www.worldnuclearreport.org/Toshiba-Westinghouse-The-End-of-New-build-for-the-Largest-Historic-Nuclear.html
18. Dave Williams, 2 March 2017, 'Georgia Power suspends work on proposed Stewart County nuclear plant', www.bizjournals.com/atlanta/news/2017/03/02/georgia-power-suspends-work-on-proposed-stewart.html
19. Nikkei Asian Review, 20 Feb 2017, 'Toshiba pulling plug on US nuclear reactor plan', <http://asia.nikkei.com/Spotlight/Toshiba-in-Turmoil/Toshiba-pulling-plug-on-US-nuclear-reactor-plan>
20. NucNet, 27 Feb 2017, 'Former Minister Warns Of 'Real Danger' Facing UK Nuclear Projects', www.nucnet.org/all-the-news/2017/02/27/former-minister-warns-of-real-danger-facing-uk-nuclear-projects
21. Michael Stothard, 2 March 2017, 'Engie reports drop in profits as it books €3.8bn in impairments', www.ft.com/content/5467e21c-ff1c-11e6-96f8-3700c5664d30
22. WNN, 22 Feb 2017, 'China revises commissioning dates of EPRs', <http://us1.campaign-archive1.com/?u=140c559a3b34d23ff7c6b48b9&id=6c7280d49e&e=ae5ca458a0>
23. Stephen Stapczynski and Aibing Guo, 15 March 2016, 'China's Areva-Designed Nuclear Reactors to Start Up in 2017', www.bloomberg.com/news/articles/2016-03-15/china-s-areva-designed-nuclear-reactors-to-start-up-in-2017
24. Michael Stothard, 1 March 2017, 'Areva posts €665m net loss in 2016', www.ft.com/content/e38738f3-a4b5-3b90-9c2b-4ec975a60157
25. Mycle Schneider, Antony Froggatt et al., 2016, 'World Nuclear Industry Status Report 2016', www.worldnuclearreport.org/IMG/pdf/20160713MSC-WNISR2016V2-HR.pdf
26. Geert De Clercq, 1 March 2017, 'French group Areva's 2016 loss narrows, received no claims over Creusot foundry', www.reuters.com/article/us-areva-results-idUSKBN1683H0
27. Michael Stothard, 14 Feb 2017, 'EDF earnings hit by low electricity prices and nuclear problems', www.ft.com/content/3f9978ae-f289-11e6-8758-6876151821a6
28. Geert De Clercq, 14 Feb 2017, 'EDF targets positive cash flow ahead of French, UK nuclear projects', <http://uk.reuters.com/article/uk-edf-results-idUKKBN15T0LJ>
29. Paul Brown, 2 Dec 2016, 'Taxpayers face bill for nuclear crisis', <http://climatenewsnetwork.net/taxpayers-bill-nuclear-crisis/>
30. Adam Vaughan, 21 Feb 2017, 'EDF faces £1m a day bill to keep French nuclear reactor offline', www.theguardian.com/business/2017/feb/21/edf-faces-1m-a-day-bill-to-keep-french-nuclear-reactor-offline