Spring 2016
Volume 12, Issue 2

Spring

Nuclear Industry Updates

Five Years Since Fukushima: How a Nuclear Disaster in Japan Changed U.S. Plant Regulations

March 11, 2016 — It's been five years since a tsunami caused a nuclear disaster in Fukushima, Japan, and nuclear plants in the United States are still working to install safeguards to ensure something akin to that disaster never happens here. Those safeguards have cost the domestic nuclear market more than $4 billion to implement and install, according to the Nuclear Energy Institute, in addition to thousands of man-hours from workers who spent time studying and installing new safeguards. The major problem encountered at Fukushima was a loss of power and water that happened when a tsunami hit the plant. With the loss of that power and water, the plant lost the ability to effectively cool the nuclear reactor, a critical process that normally prevents the reactor from overheating and causing a meltdown. Since then, the Nuclear Regulatory Commission has created a new set of rules to ensure that backup safety equipment is placed in well-protected locations at every plant that will continue working in the event of a disaster. That equipment includes diesel-driven pumps and electric genera-

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Inside this issue:

China to Build 40 Nuclear Power Plants Over the Next Five Years

January 5, 2016 — The People's Republic of China is set to build around 40 domestic nuclear power plants over the next five years, the country's Government has said. The country's 13th five year plan period, running from 2016 to 2020, includes provisions for building six to eight new nuclear power plants a year.

If all goes according to plan, the country will aim to increase its output to ten plants a year past 2020. British energy policymakers will be eyeing China's domestic nuclear power program with interest after the country's government signed a deal to finance the next generation of UK nuclear power. Chinese Communist Party general secretary Xi Jinping signed the £40bn UK deal as part of a series of investment accords in a visit to the UK in October. The deal will see the state-owned General Nuclear Corporation take a two-thirds stake in the Bradwell nuclear power plant, where a Chinese-designed nuclear reactor is planned. A one-third stake will be taken in Hinkley Point, a plant run by the French state-owned firm EDF. A one-fifth stake will be taken in a project at the Sizewell plant. David Cameron hailed the deal as "historic" and said the new plants would provide "reliable" power to homes and businesses. Meanwhile, China's £385bn domestic program represents a large increase in nuclear power use in the coun-

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Five Years Since Fukushima: How a Nuclear Disaster in Japan Changed U.S. Plant Regulations

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tors to ventilation fans, battery packs and satellite communications gear. The new rules have been termed the FLEX strategy, but they aren't the only new safeguards put in place. Jennifer Young, a spokeswoman for FirstEnergy Corp., which owns and operates the Beaver Valley Nuclear Power Station in Shippingport, said officials have also added new equipment to ensure water levels in spent fuel pools can be monitored in the event of an emergency. Officials at Beaver Valley were also required to complete seismic risk assessments for the plant, which have been completed and submitted to the NRC. Young added that it's not unusual for the domestic nuclear market to react to events such as Fukushima that, in turn, highlight the need for new regulations. "Strong coordination and sharing is a hallmark of the U.S. nuclear industry and has aided response to events including Three Mile Island, Chernobyl, September 11 and, most recently, Fukushima," Young said. "Each of these events has been met with a rigorous, detailed review by the U.S. nuclear industry and the Nuclear Regulatory Commission to ensure the country's power plants have taken appropriate actions to safeguard our facilities. "On top of that, leaders from both the domestic and Japanese nuclear industry last week met to discuss the status of changes implemented since Fukushima. Maria Korsnick, chief operating officer of the Nuclear Energy Institute, said in a report titled "Fukushima Daiichi Five Years Later: A Progress Report" that the ensuing safety enhancements have been "significant." "They are based on well-defined lessons learned from Fukushima," Korsnick said. "Their development and implementation has been coordinated by chief nuclear officers and technical advisers throughout the industry, and they are being implemented at all U.S. nuclear power plants." Young said the NRC has already completed an assessment of Unit 2 at Beaver Valley in regards to compliance with post-Fukushima requirements, and Unit 1 will be assessed by the end of the year. However, the NRC won't complete an official inspection on both units until 2017.

(By Jared Stonesifer jstonesifer@timesonline.com)

China to Build 40 Nuclear Power Plants Over the Next Five Years

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try. Mainland China currently has 30 nuclear power reactors in operation and 22 under construction, according to the World Nuclear Association.

A three-fold increase in generating capacity is planned by 2020-21, with the part aim of reducing reliance on coal and the air pollution it causes. Nuclear power does not release carbon or particulates into the atmosphere. It however creates toxic and mildly radioactive waste which must be stored indefinitely at significant cost. Clean-up costs for nuclear power stations are also high and often hidden from initial estimates. It is also common for nuclear power projects to experience significant delays and to go wildly over-budget. China's domestic commitment comes after an estimate of how much nuclear power would be needed by the State Nuclear Power Technology Corporation dating from in September 2013.

(By Jon Stone @joncstone)

World Starts Up 10, Shuts Down Eight, Nuclear Reactors in 2015

January 4, 2016 — Global nuclear generating capacity increased slightly in 2015 as 10 new reactors began supplying electricity and eight were permanently shut down, according to World Nuclear Association data.

Last year saw new reactors with total capacity of 9497 MWe connected to the grid, up from the 4763 MWe added in 2014. China added eight units, which were, in month order: Fangjiashan 2, Yangjiang 2, Hongyanhe 3, Ningde 3, Fuqing 2, Yangjiang 3, Fangchenggang 1 and Changjiang 1. South Korea and Russia added Shin Wolsong 2 and Beloyarsk 4.

Uprates saw a further 484 MWe added. South Korea, the USA and Sweden accounted for 19 MWe, 290 MWe and 175 MWe of this total. There were two downrates, of 19 MWe each, at South Korea's Wolsong 3 and 4.

As of 1 December 2015, there were 439 reactors in operation, with a total 382.2 GWe. Since then, Belgium has restarted Tihange 2 - on 14 December - and Doel 3 was expected to follow before year-end. In addition, the Belgian nuclear regulator last month approved the restart of units 1 and 2 of the Doel plant - each of these has a generating capacity of 433 MWe.
For comparison, at the start of 2015 there were 437 operable reactors and a total nuclear generating capacity of some 377.7 GWe.

China started construction of the 1080 MWe Hongyanhe 5 in March, the 1161 MWe Fuqing 5 in May, the 1080 MWe Hongyanhe 6 in July, and the 1161 MWe Fuqing 6, the 1150 MWe Fangchenggang 3 and the 1080 MWe Tianwan 5 in December. The United Arab Emirates started construction of the 1400 MWe Barakah 4 in September.

As of 1 December 2015, there were 64 units under construction, with a combined total generating capacity of 67.8 GWe. Since then, China has launched construction of the second Hualong One reactor at the site of the Fuqing nuclear power plant - the 1161 MWe Fuqing 6 - on 22 December. In recent days, China has also poured first concrete for the 1150 MWe Fangchenggang 3 and the 1080 MWe Tianwan 5 - on 24 and 27 December, respectively.

Eight units in four countries were closed permanently last year: Germany's 1345 MWe Grafenrheinfeld in June; Japan's 529 MWe Genkai 1, the 320 MWe Mihama 1, the 470 MWe Mihama 2, the 439 MWe Shimane 1 and the 341 MWe Tsuruga 1 - all in March; Sweden's 638 MWe Oskarshamn 2 in October; and the UK's 490 MWe Wylfa 1 in December.

(Researched and written by World Nuclear News)

The Effects of Fukushima Linger, But Not From Radiation

March 10, 2016 — The Fukushima Daiichi nuclear accident, which began on March 11, 2011, uprooted thousands of Japanese people, set the worldwide nuclear power industry back a decade, and caused a run on potassium iodide (said to help ward off thyroid cancer). What it didn't do was kill anyone from radioactive fallout. That was the conclusion of the six-volume Report on the Fukushima Daiichi Accident, released in August 2015 by the International Atomic Energy Agency. About 1,600 people died in the evacuation of the surrounding area, however—many of them elderly and infirm hospital patients and residents of nursing homes. That would seem to indicate that the response to the accident was more deadly than the accident itself.

A Greenpeace report released this week, "Nuclear Scars: The Lasting Legacies of Chernobyl and Fukushima," takes a harsher view, saying that "the health consequences of the Chernobyl and Fukushima catastrophes are extensive." But most of the report dwells on Chernobyl, and it notes that the primary effects of Fukushima were "mental health disorders, such as depression, anxiety and Post Traumatic Stress Disorder." Put another way: fear and panic resulting from the accident (and from the loss of homes and livelihoods) were more dangerous than the radiation.

To be sure, diagnoses of thyroid cancer have gone up among children exposed to radiation from Fukushima; but that's almost certainly due to increased screening, as this Wired analysis details. Heightened screening led to higher detection, resulting in "an epidemic of diagnosis," according to H. Gilbert Welch, a professor of medicine at the Dartmouth Institute for Health Policy and Clinical Practice.

One lasting effect of the accident has been a potentially catastrophic shift in Japan's energy policy. All Japan's nuclear reactors were shut down in the wake of Fukushima, and although the government of Prime Minister Shinzo Abe is moving to reopen selected plants, public opposition is widespread. The result: Japan now plans to build as many as 47 new coal plants in the coming years, which would eliminate any chance of meeting the country's emissions reduction targets under the Paris climate accord.If they get built, the health and environmental effects of those plants will far outweigh any of the damage from the nuclear accident itself.

(By Richard Martin, MIT Technology Review)

US Nuclear Power Fleet Aims to Cut Costs By 30%, Industry Official

December 8, 2015 — The US nuclear power industry has launched a wide-ranging initiative with the goal of cutting its electricity production costs by 30% by 2018, an industry official said Tuesday. Maria Korsnick, chief operating officer of the Nuclear Energy Institute, said during a media briefing at the National Press Club in Washington that despite record-high capacity factors achieved by US nuclear power plants in recent years, the average production cost of the electricity they generate rose significantly from 2002 to 2014. NEI said in a statement Tuesday announcing the initiative that "total electric generating costs at US nuclear plants have increased 28% -- to an industry average $36.27/MWh -- over the past 12 years," including fuel, capital and operation and maintenance costs.

Since 2013, Entergy's Vermont Yankee and Dominion's Kewaunee in Wisconsin have been permanently shut "for economic reasons," and Entergy has announced it will shut its Pilgrim in Massachusetts and FitzPatrick in New York in the next two years "largely due to financial losses," NEI said. "We are operating in markets with a glut of natural gas at historically low prices, concurrent with low electricity demand nationally," Korsnick said in the statement. "We are seeking to redesign fundamental plant processes to significantly improve operational efficiencies and effectiveness, and in the process make nuclear energy facilities more economically viable."

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US Nuclear Power Fleet Aims to Cut Costs By 30%, Industry Official

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NEI said in a fact sheet provided at the briefing that "an analysis at one US nuclear plant site found that supervisors spent over half their time on administrative duties and only 14% of their time supervising employees. In addition, little time was being spent on process improvement efforts or problem-solving activities."

Other factors contributing to increased productions costs, Korsnick said during the briefing, include significant increases in regulation of nuclear plants and electricity markets that do not adequately recognize and compensate the benefits of nuclear power, such as its reliability in extreme weather, she said during the briefing.

Industry working groups have identified initial potential savings in several areas, including improvements in corrective action programs, work management, engineering, security and regulatory efficiency, she said. Korsnick said the groups' recommendations are being reviewed by a steering committee of chief nuclear officers from companies that operate power reactors. Preliminary estimates indicate that the potential savings identified by the working groups could result in "30% cost savings across the industry," amounting to "hundreds of millions of dollars" annually, Korsnick said.

Korsnick emphasized that the initiative is being closely coordinated with the US Nuclear Regulatory Commission, and "safety reviews are built into the process" of selecting and implementing the savings proposals. In fact, by encouraging operators to take a fresh and critical look at practices and procedures at nuclear plants, the initiative is expected to enhance safety, she said. Korsnick said in response to a question that the initiative is considering various proposals to modify regional electricity markets to better value the benefits of nuclear power, including low-carbon portfolio standards that would provide additional compensation to carbon-free generators using funds from a surcharge on electricity sold in the state adopting the standard. Exelon, operator of the country's largest nuclear fleet, has proposed such a standard be adopted in Illinois, saying that would benefit its economically struggling nuclear plants and help assure reliable electricity supply. Such market reform proposals, however, are far more complex than plant-specific efficiency improvements, and so would take longer to consider and implement, Korsnick said.

Proposals approved by the steering committee will be either offered for adoption by individual nuclear plants at their discretion or, in the case of actions that must be undertaken by the industry as a whole to be effective, submitted for a vote of NEI's Nuclear Strategic Issues Advisory Committee, a standing group of chief nuclear officers, Korsnick said. Initiatives approved by that committee are binding for the entire industry.

(Washington (Platts); --Steven Dolley, steven.dolley@platts.com and Edited by Derek Sands, derek.sands@platts.com)

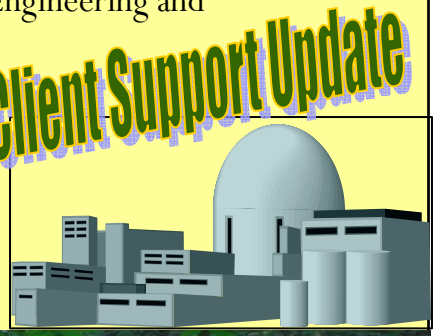
NWI Products And Services

Spring 2016 Volume 12, Issue 2

NWI Consulting, LLC is a professional consulting firm specializing in power generation performance improvement services, specialized learning interventions, computer-based training, organizational development, accreditation renewal/recovery, and professional staff augmentation. NWI has a broad portfolio of U.S. and international clients in the electric generation industry and is headquartered in Knoxville, TN. NWI's power plant services includes supporting such areas as Operations, Training, Outage Management, Nuclear Oversight, Maintenance, Radiation Protection, Chemistry, and Emergency Preparedness. NWI has assisted clients in other, more specialized efforts including Leadership/Management Development, Executive Coaching, Conflict Resolution, Multi-Discipline Assessments, Root Cause Analyses, Performance Improvement, NRC 95-002 & 95-003 and Preparations and specialized Safety Analysis (50.59).

The following key activities are being conducted by NWI professionals…

- Entergy's Grand Gulf Nuclear Station - Project support
- Entergy's River Bend Station - Performance Improvement.
- Entergy's Arkansas Nuclear One - Work Management, Operations, Engineering and Nuclear Safety Culture/Performance Improvement Support.
- Entergy's Corporate Oversight/Functional Area Support.
- EPRI's Switchyard Reliability Study
- EPRI's Service Life Study



Thank You

We wish to express special thanks to the following clients for making NWI a preferred consulting company.

- Entergy's Corporate Office
- Arkansas Nuclear One
- River Bend Station
- Grand Gulf Nuclear Station
- Electric Power Institute

Editor: Frank S. Tsakeres, NWI