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Commercial Nuclear Industry Updates

U.S, Initial accreditation for Vogtle Three and Four granted; first in 22 years

INPO's National Nuclear Accrediting Board on Wednesday, March 21 granted ccreditation of Georgia Power's Vogtle Three and Four operations training programs – resulting in formation of a new branch of the National Academy for Nuclear Training, the first new domestic branch since 1990. The Accreditation Team activities were led by Accreditation Team Manager Mike Llewellyn. Other INPO employees on the team were senior evaluators Ken Crouch and Greg Ruppert. Accreditation Director Steve Johnson was the senior management representative. Peers and industry advisors on the team were experienced training managers and directors. The team used the process described in ACAD 08-001, The Process for Initial Accreditation of Training in the Nuclear Power Industry, for conducting the evaluation of Vogtle Three and Four's operator training programs to the Objectives and Criteria of ACAD 02-001, The Objectives and Criteria for Accreditation of Training in the Nuclear Power Industry. Initial accreditation is focused on analysis, design and develop – the first three phases of ADDIE (Analysis, Design, Development, Implementation and Evaluation) in the Systematic Approach to Training process. Early accreditation helps ensure sound, effective training is implemented as new plant workers are hired and trained for accredited positions. National Academy for Nuclear Training personnel will continue to engage with Vogtle Three and Four training personnel in a series of follow-up visits, evaluating training at Vogtle Three and Four as it is implemented. The accreditation comes 18 months prior to the first docketed operator written examination and approximately four years ahead of Unit Three fuel load. The programs will be reviewed for renewal prior to fuel load or in four years, whichever is sooner. Vogtle Three and Four personnel received a combined construction and operating license on Feb. 10, 2012. The two units are of AP1000 Westinghouse pressurized-water reactor design. The vendor design was certified for construction in the U.S. by the Nuclear Regulatory Commission in December 2011. Current projected fuel load date for Unit Three is in the second quarter of 2016 with commercial operations in the fourth quarter of 2016. The Unit Four fuel load is currently scheduled for the third quarter of 2016.

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Japan to Reconsider Nuclear Power in an Attempt to Guarantee Electricity Supply

Japan is facing an electricity crunch this summer, potentially so severe, that companies such as Komatsu, the world's No. 2 maker of construction machinery, have said they will move factories overseas if electricity supply isn't guaranteed. Bloomberg reports that all but one of Japan's 54 reactors are now offline after the March 11 earthquake and tsunami last year crippled Tokyo Electric Power Co.'s Fukushima Dai-Ichi nuclear station. The reactors, which previously supplied 30 percent of Japan's electricity, have either been closed by the disaster, by government order or not allowed to restart after regular maintenance shutdowns. The remaining one reactor is (Cont. on Pg. 5)

CHERNOBYL UPDATE

On April 26, on the 26th anniversary of the world's worst nuclear disaster, work began on a gigantic structure that will entomb the remains of the stricken reactor building, a task that should be completed by 2015. April Yee reports from the Chernobyl nuclear power plant in Ukraine...At the exit of one of Chernobyl's administrative buildings on to the strip of land outside the infamous nuclear plant, a red ticker above the door flickers with three real-time readings: the time, the temperature and the radiation level. The fluctuating working conditions at the site of the world's worst nuclear disaster, where radiation levels at times rise high enough for workers to withdraw mid-shift, complicate even routine tasks such as mowing the lawn or supplying cement.

Consider the task now at hand. On Thursday, the 26th anniversary of an explosion and start of a meltdown at Chernobyl's reactor unit 4, construction began on a 24,000-tonne steel structure to replace the patchwork shell that today covers the remains of the destroyed reactor. The new seven-layer cladding, 20 meters thick at some places, includes a positive-pressure void designed to keep radioactive dust from escaping.

The cladding is to come from Turkey; the 600,000 bolts from Italy; and the workers from Lebanon, Syria, Ireland, India, the Philippines and farther afield. By the time of its scheduled completion in November 2015, when it will be rolled like a railway car over the old reactor sarcophagus, the structure will be as heavy as three Eiffel Towers and roomy enough to contain a stadium or a Statue of Liberty. The total cost for the project is estimated at €1.2 billion (Dh5.84bn). "It's a prototype, and it does not exist anywhere else in the world," says Nicolas Caillé, the project director at Novarka, the contractor involved in the project. "You have to do a perfect job."

The quest to entomb Chernobyl's remains has been a matter of urgency since the accident on April 26, 1986. After a fire broke out at the reactor, the former USSR deployed helicopters to drop 5,000 tonnes of boron, sand and lead on to the site to combat the blaze and contain radioactive materials. Soon, an estimated 60,000 workers from around the Soviet Union began cleaning the site and erecting a concrete structure to seal the remains of the plant. The workers, known as liquidators, received varying doses of radiation depending on how soon they were deployed and whether they worked in critical areas such as on the roof. Because of decay and fears that the hastily built structure would collapse, it has been repaired over time while Ukraine tried to raise funds to build a more permanent structure. The new arch - designed to last for 100 years - will include a massive red crane imported from the United States that will allow Chernobyl's workers to dismantle the plant beneath the protective shell. The hope among Chernobyl's management is that by the time they are done with the work about half a century from today, Ukraine will have found and prepared a deep underground site for the long-term storage of highly radioactive waste.

The shell will also help to forward the plans of politicians in Ukraine and Belarus to resettle some of the areas that were contaminated by the radioactive fallout that also spread across parts of Western Europe and the former Soviet Union. Mykola Azarov, the Ukrainian prime minister, said in a speech last week that he hoped to "revitalize" some of the areas where, 26 years later, radiation levels have fallen. Last Wednesday, workers repainted a curb white and mowed a lawn to prepare for a visit from Viktor Yanukovych, the Ukrainian president, who was to arrive the next day for the ceremony to start the shell construction and honor Chernobyl's legacy. "Before 26 April, 1986, the world had an illusion of security," Mr Yanukovych said during his visit that day. "After this date, no one and nowhere can be sure of a safe future. And the events at Japan's Fukushima Dai-ichi nuclear power plant have only confirmed this bitter truth of life." Chernobyl's existing sarcophagus looks like an industrial interpretation of a cathedral. Two ventilation stacks - an old one, which will be demolished, and a new one that will begin working once the new shell is in place - sit at the apex of the massive roof. Rusted portions have been repaired and the walls have been reinforced with extra supports that look like a cathedral's buttresses. On the construction site nearby, workers in white radiation protection suits, hard hats and masks directed cement trucks under the shadow of seven immense cranes. Five years before the construction began this month, Novarka began the work to prepare the site, including extracting twisted metal debris that had been thrown from the reactor and laying a concrete floor to shield workers from long-term exposure to the contaminated earth. In spite of the real-time reminders of radiation, Mr Caillesays his biggest concern is the engineering. His company specializes in projects such as building petrochemical (Cont. on Pg. 5)

U.S. Nuclear Industry Posted Strong Safety Performance in 2011

WASHINGTON, D.C.—U.S. nuclear energy facilities in 2011 recorded the lowest number of unplanned shutdowns in more than a decade and achieved near-record levels of reliability and safety performance, according to safety and operations data compiled by the World Association of Nuclear Operators (WANO) and the Institute of Nuclear Power Operations (INPO). U.S. companies achieved these milestones despite a year marked by severe weather events that caused extensive damage to communities in numerous states.

Also, the industry reached record levels for industrial safety, placing it among the best industries in U.S. Bureau of Labor Statistics rankings.

The nuclear energy facilities that supply electricity to one of every five U.S. homes and businesses recorded 62 unplanned shutdowns last year, three fewer than the decade-low 65 that occurred in 2005. The record-low number of unplanned shutdowns helped America's nuclear power plants achieve reliability levels on par with the high operational efficiency sustained throughout the past decade.

Unplanned shutdowns can result from severe weather or grid disturbances that trigger safety responses. In 2011—despite tornadoes in the Southeast, the Virginia-centered East Coast earthquake, Hurricane Irene and flooding in the Midwest—U.S. nuclear energy facilities posted a capability factor of 91.4 percent. **Last year marked the 10th straight year that a median capability factor of at least 91 percent has been achieved.** Capability factor measures the amount of time a facility is online and producing electricity. The industry's record-high capability factor, 92 percent, was set in 2005.

"Plants with a high unit capability are successful in reducing unplanned outages and completing scheduled work effectively during planning outages," states INPO's report on the industry performance indicators.

"America's nuclear energy facilities performed extremely well in the face of a host of natural challenges," said Tony Pietrangelo, the Nuclear Energy Institute's senior vice president and chief nuclear officer. "The industry's employees can take pride in this achievement while recognizing that their commitment to safety and excellence must never waver. Plant safety is the foundation of our industry's ability to help make the United States a better, more secure place to live, work and raise our families."

U.S. nuclear energy facilities last year sustained the high safety performance that has been the underpinning of the industry's ability to improve reliability and increase electricity production, Pietrangelo said. **Since 1990, the U.S. nuclear energy industry has increased its electricity production nearly 40 percent—last year generating 790 billion kilowatt-hours of electricity—from approximately the same number of reactors.**

Other performance indicator data on U.S. facilities follows:

Safety System Performance. For the 10th straight year, key backup safety systems concurrently met availability goals more than 93 percent of the time. Nuclear power plants are built (Cont. on Pg. 4)

U.S. Nuclear Industry Posted Strong Safety Performance in 2011

(CONT FROM PG. 3)

with multiple safety systems and backup power supplies so these systems are available, if needed, even when maintenance is being performed on a similar system or component. The three principal backup safety systems are two main cooling systems and backup power supplies used to respond in the event of unusual situations. Each system at every plant has an availability goal just shy of 100 percent due to maintenance and testing, and 95 percent of these backup safety systems met their goal in 2011, assuring that multiple layers of safety were in place as designed.

Industrial Safety. The nuclear industry is one of the nation's safest working environments. U.S. facilities continued to post a low industrial accident rate in 2011 achieving a record 0.06 industrial accidents per 200,000 worker-hours, well below the 2015 goal of 0.1. Statistics from other industries through 2010, compiled by the U.S. Bureau of Labor Statistics, show that it is safer to work at a nuclear power plant than in the manufacturing sector and even pharmacies and personal care stores, real estate, and financial sectors.

Reactor Capability. America's 104 reactors continued to operate at high levels of efficiency—far above other electricity sources. Last year marked the eighth time in the past 10 years that the median capability factor has been at least 91.4 percent. Capacity factor, a related metric that measures total electricity generated as a percentage of year-round potential generation, was 89 percent in 2011, according to data compiled by the U.S. Energy Information Administration.
Unplanned Reactor Shutdowns. The 2011 total of 62 unplanned automatic or manual shutdowns was the lowest level achieved in the past 12 years.

Forced Capability Loss Rate. The 2011 median value of 1.4 percent capability loss remained near historically best levels. Forced capability loss rate measures a plant's outage time and power reductions that result from unplanned equipment failures, human error or other limiting conditions when the plant is expected to be generating electricity. The 2015 goal for this indicator is a median value of one percent. In the mid-1990s, the median value exceeded five percent, but it has been under two percent each year since 2001 and 1.5 percent or lower for seven consecutive years.

"These 2011 safety and performance indicators provide overwhelming evidence of the resiliency of our plants in confronting weather challenges and confirm the unwavering commitment of the industry's dedicated men and women to safe and efficient operations," Pietrangelo said.

WANO, headquartered in the United Kingdom, compiles nuclear energy industry performance data annually. Data for the U.S. industry is analyzed by the Atlanta-based Institute of Nuclear Power Operations to help set challenging benchmarks of excellence against which safety and plant operation can be measured. INPO was established by the U.S. nuclear energy industry in 1979 to promote excellence in safety and operating performance above and beyond federal regulatory requirements.

"The Nuclear Regulatory Commission's recent approval of licenses to build new reactors in Georgia and South Carolina, coupled with recent polling by Gallup and others showing public confidence in the safe operations of our plants, demonstrates that nuclear energy has an important role to play as a dependable low-carbon source of electricity," NEI's Pietrangelo said.

CHERNOBYL UPDATE

(CONT FROM PG. 2)

plants and civilian infrastructure, and he has come this year from managing the construction of a tunnel in Newcastle in England. "For me, the challenge is to build the arch," says Mr Caille. "It's like building a bridge or building a tunnel. When I build a bridge, I'm interested in the bridge, not by all the cars that will use the bridge." Inside the administrative building with the real-time temperature and radiation readings, Julia Marusich, a member of Chernobyl's international department, shows visitors from Japan's Fukushima prefecture and a Californian university's public-health institute the construction site and the engineering blueprint.

"The problem of Chernobyl won't be solved by our generation," she says. "People need time." Will the cover be completed on time? "We optimistically hope," says Ms Marusich, crossing fingers on both hands.

Japan to Reconsider Nuclear Power in an Attempt to Guarantee Electricity Supply

(CONT FROM PG. 1)

due to close on May 5 for maintenance.

"Did You Pay the Gas Bill?"

As a result, Japan's fuel import bill has sky rocketed. Liquefied natural gas imports rose to a record in 2011 as utilities have been forced to rely on fossil fuel power plants to replace idled reactors. Japan imported 1.75 million kilolitres of oil, or about 369,000 barrels a day, for power generation in February, more than four times as much as a year ago, according to data from the Ministry of Economy, Trade and Industry in a separate article, while imports for power generation were up 15 percent from January alone.

There seems to be a government-led imperative to get some of these nuclear plants back online as Kansai Electric, the utility most dependent on nuclear at 49 percent of generating capacity, warns it may fall nearly 20 percent short this summer. The company serves the Kansai area of western Japan that covers an area the size of Belgium, has an economy worth $1 trillion — about the size of Mexico's — and is home to the cities of Osaka and Kyoto as well as factories of Sharp Corp. and Panasonic Corp., Bloomberg reports.

Bring Back Nuclear, They Say

Although much controversy remains, even some local politicians and the general public appear to be favoring re-starts as employment suffers in areas where plants dominate the local economies.

Overseas reaction to nuclear energy post-Fukushima, however, vary. Germany still plans to close all its plants by 2020, and even in France questions are being asked about expansion to what is one of the world's most comprehensive nuclear generating networks.

But emerging markets are still showing enthusiasm for nuclear power as a secure provider of low greenhouse gas-emitting base-load electricity. In Turkey, China is said to be close to securing a contract to finance and build a plant on Turkey's Black Sea coast, in spite of the Chinese touting older technology. China is developing newer technologies off its own back as it is prevented from poaching the technologies of Westinghouse and Areva, who are constructing plants for the Chinese in what is currently the world's largest nuclear construction program — but don't be surprised if the Chinese "discover" very similar solutions to the technical challenges solved by Western firms.

Meanwhile, Turkey already has another plant planned with a Russian manufacturer, and Russia's Rosatom is said to be keen to bid for the construction of two plants in the UK's program of plant replacements, according to the Telegraph. It would seem that while many countries share Japan's safety concerns, the cost associated with the alternatives — whether they are self-inflicted by Co2 emission targets or real ones such as import bills – mean nuclear remains a viable alternative if not an outright necessity.

State Help Needed for New Nuclear Units, Exelon Chief Says

U.S. utilities will need government help to build nuclear reactors as other forms of electric power become less expensive, a top executive of Exelon Corp. (EXC), the nation's largest commercial producer of atomic energy, said. State support may include letting companies recover costs from customers during construction, providing loan guarantees or agreeing to buy power from the plant, Mayo Shattuck III, executive chairman of Chicago-based Exelon, said today at a conference in Washington.

Building reactors may require "the sovereign support of that state, which really means it's on the backs of the ratepayers, not the backs of the shareholders," Shattuck said at an event hosted by the Center for Strategic and International Studies.

The Nuclear Regulatory Commission on March 30 awarded Scana Corp. (SCG) a permit to build two reactors at a plant near Columbia,South Carolina, and on Feb. 9 approved Southern Co. (SO)'s plan for two units at its Vogtle plant near Augusta, Georgia. Southern expects its project to cost $14 billion. Scana will cover 55 percent of the estimated $10.2 billion for the South Carolina reactors. The plants, being financed partly by customers, may be among the last in the U.S. this decade.

Gas Glut

A glut of natural gas created by advances in drilling techniques has lowered electricity prices, discouraging investment in other forms of generation, including nuclear. Gas prices at a 10-year low means developing nuclear power isn't feasible in states with deregulated energy markets. Generating companies can't win investors or recapture capital costs as gas drives wholesale electricity prices lower.

Natural gas fell 4.7 cents, or 2.3 percent, to $1.984 per million British thermal units today on the New York Mercantile Exchange, the lowest settlement price since January 2002.

Economic conditions raise "very serious questions" about the possibility of building new reactors without government support, Shattuck said.

"Even the existing fleet is feeling a little bit of the pressure in this kind of environment," he said. The U.S. has 104 commercial operating reactors.

Exelon operates in states where electricity prices are determined by traders, rather than being set by regulators. The company, which currently has no plans to build more nuclear reactors, can't recover costs during the construction phase because of this regulatory structure. The company operates 13 nuclear power plants, with 22 reactors.

Unforeseen Events

It's "naive" to assume gas will remain the preferred low-cost option for generating power because circumstances, including a price on carbon emissions, environmental concerns about natural-gas drilling or a terrorist attack on a gas plant, would raise costs, Shattuck said.

Unforeseen events "could easily occur in the next few years that will change the game again," he said. "The generation footprint of 50 to 60 years from now has to have some nuclear" energy, he said.

Exelon merged in April, 2012 with Constellation Energy Group Inc. (CEG), a utility led by Shattuck. John Rowe, Exelon's former chief executive officer, promoted natural gas as an alternative to clean-energy subsidies for nuclear reactors, and wind and solar energy.

FIRST SHIPMENT OF LOW-LEVEL RADIOACTIVE WASTE ARRIVES IN WEST TEXAS

Posted Saturday, Apr. 28, 2012—The first shipment of low-level radioactive waste has safely arrived at the Texas Compact Disposal Facility in West Texas, officials said Friday.

In time, shipments from 36 states may head to the dump, operated by Waste Control Specialists in Andrews County near the New Mexico border. The site is owned by Dallas billionaire and Republican political donor Harold Simmons.

Environmentalists have long worried about accidents in shipping the material to the site or contamination once the loads are left at the facility. "Valhi is proud that WCS has reached this important milestone and has now established itself as a leader and innovator within the industry," said Steven Watson, president and CEO of Valhi, parent company of WCS. "We believe the prospects for this business are extraordinary, due to the unique characteristics of the industry and WCS' experience and extensive disposal and treatment capabilities."

NWI Products And Services

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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).

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- Bill Cheever continued to assist Monticello in preparation for their upcoming EPU outage in the design engineering and project management areas.
- Marv Engen is supporting Oversight activities at Grand Gulf.
- Mike Gettle has joined the CAP/recovery team at PPL's Susquehanna Steam Electric Station.
- Ernie Harkness continues to support Entergy's Nuclear Safety Review Board.
- Bill McNeill and Frank Tsakeres have provided Throughput Assessment Evaluation at NextEra Energy's Pt. Beach Nuclear Plant.
- Tim Bostwick continues to lend his CAP expertise and insights to a new clients at ENP/POOD Ft. Calhoun and Browns Ferry nuclear plants.
- Steve Pettinger continues to assist the DC Cook site team in writing the current ILT classes NRC Exam.
- Terry Johnson joined the TVA Nuclear's Browns Ferry Plant CAP team supporting current recovery activities
- Keith Deck has just completed his support for CAP training at Ft. Calhoun Station.
- Rick Westcott continues providing causal analysis and CAP recovery activities for Ft. Calhoun Station.
- Larry Searle, Dan Paxton, Ken Payne and Jim Sollis are supporting CENG's Calvert Cliffs Maintenance & Technical Training improvement efforts.
- Ken Davidson and Becky Lane have been assisting Entergy's Fitzpatrick plant in the area of training.

Thank You

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

- **AEP's D.C. Cook Nuclear Power Plant**
- **APS's Palo Verde Nuclear Station**
- **CENG's Calvert Cliffs Power Station**
- **Entergy Nuclear Operations**
- **Exelon Nuclear Partners**
- **OPPD's Ft. Calhoun**
- **Xcel Energy's Monticello Plant**
- **PPL Susquehanna Steam Electric Station**
- **NextEra Energy's Point Beach Station**
- **FPL's Turkey Point Nuclear Plant**

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