WINTER 2017
VOLUME 13, ISSUE 1

Illinois Lawmakers Pass Legislation Recognizing Nuclear's Clean Air, Economic Values

Dec. 2, 2016—The Illinois Legislature passed the Future Energy Jobs Bill (SB 2814), a measure that will ensure the continued operation of the Clinton and Quad Cities nuclear power plants in that state. In a statement, NEI said the bill's passage was a "remarkable moment" for the state and the nuclear industry.

The bill strengthens and expands the state's renewable portfolio standard and substantially expands energy efficiency programs, while also recognizing the value of nuclear to meeting Illinois' clean energy goals by introducing a zero emission standard. The legislation next goes to Gov. Bruce Rauner, who has signaled he will sign it.

The passage of the Future Energy Jobs Bill will preserve more than 4,000 well-paying jobs at Exelon's Clinton and Quad Cities nuclear power plants in Illinois. [Photo: Exelon]

"This is a remarkable moment for the people of Illinois and for thousands of nuclear energy industry employees," Maria Korsnick, NEI's chief operating officer, said. "Gov. Bruce Rauner and members of the Illinois General Assembly deserve immense credit for recognizing the unique value of the state's nuclear power plants and their important role in its critical infrastructure."

Exelon Corp., which operates the Clinton and Quad Cities plants, supported the legislation and hailed its passage. Chris Crane, president and chief executive officer of Exelon, said the bill "levels the playing field and values all carbon-free energy equally,

Inside this issue:

Palisades Power Plant to Shut Down Permanently in 2018, Impacts 600 Jobs

Dec. 8, 2016—Van Buren County's Palisades Nuclear Plant is shutting down for good, according to a release from Entergy Corporation. The plant in Covert Township will close on October 1, 2018

The shutdown will impact about 600 employees. Palisades has seen its share of problems over the past few years, and has temporarily shut down a number of times.At one point it was named one of the worst-performing nuclear facilities in the U.S. Entergy Corporation (NYSE: ETR) and Consumers Energy, Michigan's largest utility and the principal subsidiary of CMS Energy (NYSE: CMS),

(Continued on Page 2)

Palisades Power Plant to Shut Down Permanently in 2018, Impacts 600 Jobs

(Cont. from Page 1)

have agreed to an early termination of their power purchase agreement (PPA) for the Palisades Power Plant in Covert Township in 2018, lowering the costs to Consumers' customers by as much as $172 million over four years. The agreement is subject to regulatory approvals. Separately, and assuming regulatory approvals are obtained for the PPA termination, Entergy intends to shut down the Palisades nuclear power plant permanently on Oct. 1, 2018.

"Entergy recognizes the consequences of a Palisades shutdown for our approximately 600 employees who have run the plant safely and reliably, and for the surrounding community, and we will work closely with both to provide support during the transition," said Leo Denault, Entergy's chairman and chief executive officer. "We determined that a shutdown in 2018 is prudent when comparing the transaction to the business risks of continued operation."

The original agreement committed Consumers Energy to purchase nearly all of the power that Palisades generates through April 2022. Under the current plan, and assuming regulatory approval of the request to terminate the PPA in 2018, Palisades will be refueled as scheduled in the spring of 2017 and operate through the end of the fuel cycle, then permanently shut down on Oct. 1, 2018.

Since first entering into a PPA in 2007, when Entergy purchased Palisades from Consumers Energy, market conditions have changed substantially, and more economic alternatives are now available to provide reliable power to the region. The transaction is expected to result in $344 million in savings, $172 million of which is expected to lower Consumers Energy customers' costs over the early termination period from 2018 to 2022, and $172 million of which Consumers Energy will pay to Entergy for early PPA termination. The early termination payment to Entergy will help assure the plant's transition from operations to decommissioning, maintaining our commitment to meet US Nuclear Regulatory Commission requirements. To support the community during the transition, Entergy and the Consumers Energy Foundation will provide a total of $10 million over several years in economic development funding for the Southwest Michigan region. The companies will consult with the Council of Michigan Foundations and local stakeholders as it relates to the distribution of these funds. Of the $10 million, the Consumers Energy Foundation will contribute $2 million and Entergy $8 mil-

(Continued on Page 3)

Palisades Power Plant to Shut Down Permanently in 2018, Impacts 600 Jobs

(Continued From Page 2)

lion. The process for reviewing requests for funds and distributing them will be announced later, with a focus on sustainable economic development that will broaden the community's tax base.

"Entergy is committed to treating our employees fairly throughout this process and will assist employees who want to relocate within Entergy or leave the company," said Bill Mohl, president of Entergy Wholesale Commodities, a business unit within Entergy. "Additionally, Consumers Energy has committed to work closely with Entergy as part of its ongoing talent recruitment efforts and will consider potential placement of up to 180 appropriately skilled employees from Palisades into the utility's workforce over time."

Consumers Energy plans to ask the Michigan Public Service Commission to approve the early termination of the PPA, effective May 31, 2018. CMS and Palisades will sign a new PPA under which the plant would continue to operate until Oct. 1, 2018. Entergy will notify the power grid operator, the Midcontinent Independent System Operator, as well as the NRC, of its intent to permanently shut down and decommission Palisades.

Financial Implications

As a result of the agreement to terminate the PPA and its intention to shut down the plant, Entergy will recognize a non-cash impairment charge of approximately $390 million ($252 million after-tax) in the fourth quarter of 2016. In addition to the impairment charge, through the end of 2018 Entergy expects to record additional charges totaling approximately $55 million related to severance and employee retention costs.

The impact on free cash flow from the agreement is expected to be positive compared to the alternative of closing the plant at the end of the current PPA. The expected changes in free cash flow include the payment for early termination of the PPA, an expected contribution to the decommissioning trust fund, severance and retention costs and changes in capital expenditures and operating cash flows. The actual amount of the anticipated contribution to the decommissioning trust will be determined later. Cautionary Note Regarding Forward-Looking Statements In this news release, and from time to time, Entergy Corporation makes certain "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. Such forward -looking statements include, among other things, Entergy's plans more and expectations with respect to the Palisades Power Plant and the anticipated financial effects of the agreement to terminate the PPA and planned shutdown of the plant and other statements of Entergy's plans, beliefs or expectations included in this news release. Except to the extent required by the federal securities laws, Entergy undertakes no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise.

Forward-looking statements are subject to a number of risks, uncertainties and other factors that could cause actual results to differ materially from those expressed or implied in such forward-looking statements, including (a) those factors discussed elsewhere in this news release and in Entergy's most recent Annual Report on Form 10-K, any subsequent Quarterly Reports on Form 10-Q and Entergy's other reports and filings made under the Securities Exchange Act of 1934; (b) uncertainties associated with rate proceedings, formula rate plans and other cost recovery mechanisms; (c) uncertainties associated with efforts to remediate the effects of major storms and recover related restoration costs; (d) nuclear plant relicensing, operating and regulatory costs and risks, including any changes resulting from the nuclear crisis in Japan following its catastrophic earthquake and tsunami; (e) changes in decommissioning trust fund values or earnings or in the timing or cost of decommissioning Entergy's other nuclear plant sites; (f) legislative and regulatory actions and risks and uncertainties associated with claims or litigation by or against Entergy and its subsidiaries; (g) risks and uncertainties asso-

(Continued on Page 9)

Greenlands Receding Icecap to Expose Top Secret US Nuclear Project

The lid of Camp Century's unsealed nuclear fuel vessel, pictured in 1962. Photograph: W Robert Moore/National Geographic/Getty Images

Sept. 27, 2016-Camp Century – part of Project Iceworm – is underground cold war network that had been thought buried forever, until climate change made that highly unlikely. A top-secret US military project from the cold war and the toxic waste it conceals, thought to have been buried forever beneath the Greenland icecap, are likely to be uncovered by rising temperatures within decades, scientists have said. The US army engineering corps excavated Camp Century in 1959 around 200km (124 miles) from the coast of Greenland, which was then a county of Denmark. Powered, remarkably, by the world's first mobile nuclear generator and known as "the city under the ice", the camp's three-kilometer network of tunnels, eight meters beneath the ice, housed laboratories, a shop, a hospital, a cinema, a chapel and accommodation for as many as 200 soldiers. Its personnel were officially stationed there to test Arctic construction methods and carry out research. Scientists based at the camp did, indeed, drill the first ice core samples ever used to study the earth's climate, obtaining data still cited today, according to William Colgan, a climate and glacier scientist from the Lassonde school of engineering at Toronto's York University, and the lead author of the study. In reality, the camp served as cover for something altogether different - a project so immense and so secret that not even the Danish government was informed of its existence.

"They thought it would never be exposed," said Colgan. "Back then, in the 60s, the term global warming had not even been coined. But the climate is changing, and the question now is whether what's down there is going to stay down there." The study suggests it is not. Project Iceworm, presented to the US chiefs of staff in 1960, aimed to use Camp Century's frozen tunnels to test the feasibility of a huge launch site under the ice, close enough to fire nuclear missiles directly at the Soviet Union. At the height of the cold war, as the US and the USSR were engaged in a terrifying standoff over the deployment of Soviet missiles in Cuba, the US army was considering the construction of a vast subterranean extension of Camp Century. A system of about 4,000 kilometers of icy underground tunnels and chambers extending over an area around three times the size of Denmark were to have housed 600 ballistic missiles in clusters six kilometers apart, trained on Moscow and its satellites. Eventually the engineers realized Iceworm would not work. The constantly moving ice was too unstable and would have deformed and perhaps even collapsed the tunnels.

A crane positions Camp Century's nuclear waste tank. Photograph: W Robert Moore, National Geographic/Getty Images

From 1964 Camp Century was used only intermittently, and three years later it was abandoned altogether, the departing soldiers taking the reaction chamber of the nuclear generator with them. They left the rest of the camp's infrastructure – and its biological, chemical and radioactive waste – where it was, on the assumption it would be "preserved for eternity" by the perpetually accumulating snow and ice. Thus far their assumption has proven correct. Up to 12 meters deep at the time it was abandoned, the ice covering Camp Century has since thickened to around 35 meters and will continue to deepen for a while yet. Climate change, however, looks certain to reverse that process, Colgan and his six-strong team from Canadian, US and European universities said in their report, which was published last month in Geophysical Research Letters. Greenland's temperatures broke new records this spring and summer, hitting 24C (75F) in the capital, Nuuk, in June – a figure that shocked meteorologists so much they had to recheck their measurements.

(Continued on Page 5)

Greenlands Receding Icecap to Expose Top Secret US Nuclear Project

Between 2003 and 2010, the ice that covers much of the island melted twice as fast as during the whole of the 20th century. This year it began melting a month earlier than usual.

The researchers studied US army documents and drawings to work out how deep the camp and its waste – estimated to include 200,000 litres of diesel fuel, similar quantities of waste water and unknown amounts of radioactive coolant and toxic organic pollutants such as PCBs – were buried.

Then they ran regional and global climate change simulations to work out how much longer they would remain interred. Based on the "business as usual" climate change scenario, Colgan said, snowfall would continue to be greater than ice melt for a few more decades. "But after that, melt will be greater than snow. Every year, another layer of ice will be removed. Our estimate is that by 2090, the exposure will be irreversible. It could happen sooner if the magnitude of climate change accelerates."

Once that starts to happen, the question of who is responsible for the clean-up – already the subject of discussion – will become more pressing, the report said, presenting "an entirely new form of political dispute resulting from climate change".

With no established agreement on the question, the report says the "multinational, multi-generational" problem posed by Camp Century and its waste could become a source of tension between the US, Greenland and Denmark.

Denmark allowed the US to build Camp Century and other bases on Greenland in a 1951 agreement, but it is not clear how much it was told about the work being done there or the waste left behind. Complicating matters further, Greenland became largely self-governing in 1979.

Vittus Qujaukitsoq, Greenland's foreign minister, said he was concerned about the camp's future and determined to establish responsibility. His Danish counterpart, Kristian Jensen, has said the issue was being examined in close contact with Greenland.

The Pentagon has said it "acknowledges the reality of climate change and the risk it poses" for Greenland, adding that the US government has pledged to "work with the Danish government and the Greenland authorities to settle questions of mutual security".

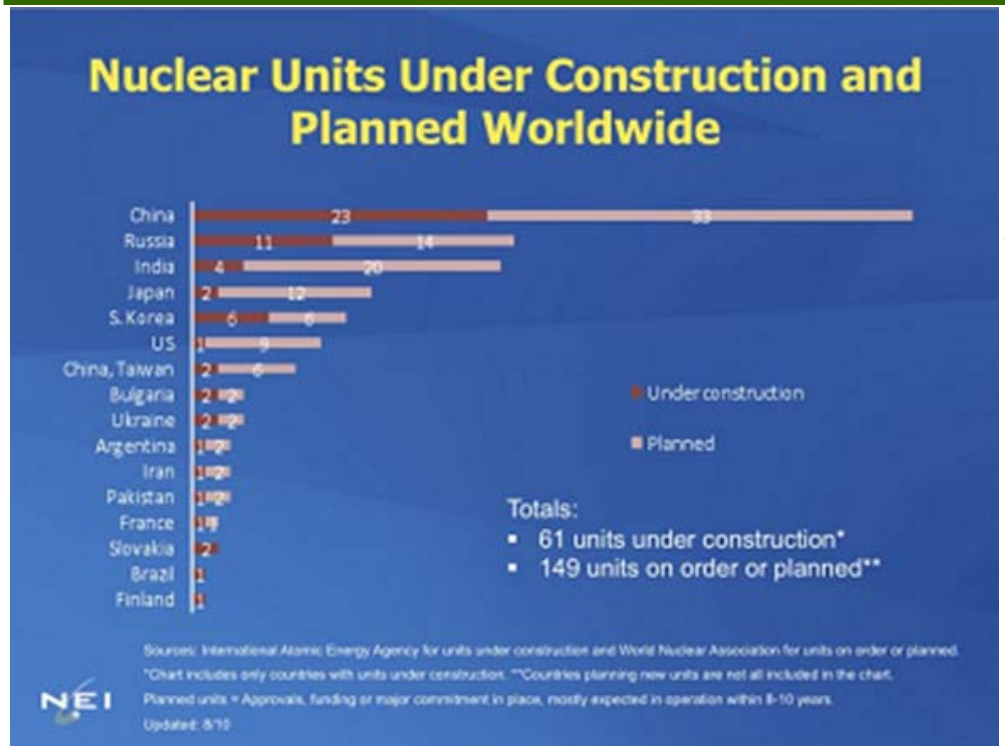
The Guardian, Jon Henley

Trump Could Fuel A Nuclear Energy Boom In 2017

Dec. 6, 2016—With Trump at the helm, sentiment gives way to practicality in the energy industry. For the vast untapped potential of the nuclear energy industry and the uranium that feeds it, this could contribute to a market-disrupting revival that no longer bows to fear and the politics of economy. While there have been some oversupply issues keeping uranium prices down, the bigger problem has been negative sentiment rather than real fundamentals, but the Trump presidency will see through that. Trump's take on nuclear energy is quite simple. As he noted after the 2011 Fukushima disaster in Japan: "If a plane goes down, people keep flying. If you get into an auto crash, people keep driving." Now more than ever, demand for uranium appears to be assured. But more than that, it's about to truly explode as a number of situations combine to form the new era of nuclear power. "If you are going to acquire uranium assets, now is the right time," IsoEnergy Ltd. CEO and President Craig Parry told Oilprice.com. "If it's not the bottom yet, you can certainly see it. And on that front we see the market at the early stage of what will become a roaring bull market." Parry might be onto something, and IsoEnergy is indeed in high acquisition mode, targeting the discovery and development of high-grade uranium deposits in and around the Athabasca Basin in Saskatchewan—home

(Continued on Page 6)

Trump Could Fuel A Nuclear Energy Boom In 2017



to some of the world's biggest high-grade deposits. Getting Ready for Uranium to Become an Irresistibly Hot Commodity While Trump might inject a major boost of energy into the U.S. nuclear industry and the uranium market through deregulation, there are other factors coalescing around the world to make this a stellar new beginning for uranium and nuclear energy. We're already seeing the biggest uranium producers stocks reacting, including Cameco Corporation NYSE:CCJ), AREVA (EPA:AREVA), BHP Billiton (NYSE:BHP), and Uranium One (TSE:UUU). Canadian Cameco's stock was up 25 percent in November, and while the spot prices are low and set to rise, Parry points out that spot prices are all but irrelevant in this market, as almost all uranium is sold at long-term contract prices, which are presently coming in upwards of US$40 per pound, significantly higher than the current spot prices.

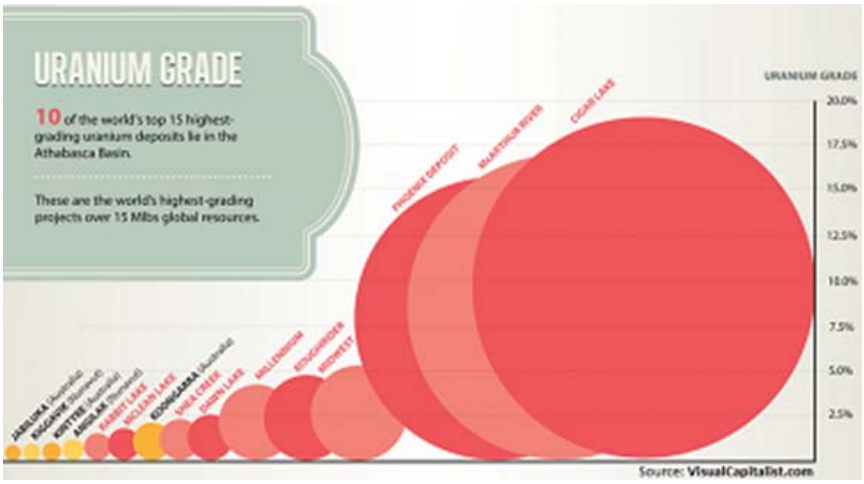
The outlook for uranium looks even more bullish when you consider that these contracts are now coming to a close, and uranium is poised to become a very hot commodity once again. Major American and European nuclear reactors are coming off supply in 2017 and 2018, and will be looking for long-term contracts once again. The biggest uranium producer in the world, Canadian Cameco, said earlier this month that some 500 million pounds of uranium will be needed for nuclear reactors in the next ten years, and it hasn't been contracted out yet. Buyers of this uranium will have to hit the market sooner rather than later. Analysts at Cantor Fitzgerald recently predicted that there would be a "violent increase" in uranium prices at some point, theorizing that as much as 80 percent of the uranium market might be uncovered in terms of supply by 2025, and that demand would by then outstrip supply.

"The low-price environment has choked off exploration activity for uranium and we are at the point where there are not enough uranium projects in the pipeline that can adequately meet the coming demand," the London Telegraph quoted Cantor as saying. All of this coincides with a phenomenal number of new nuclear reactors being built, which will also enter the market at the same time. The end result? We're looking at the biggest deficit ever in the uranium market by 2018.

So we have over 20 Chinese nuclear reactors already under construction, plans from India to significantly increase its nuclear demand, and plans to restart over 20 Japanese reactors. These three things are major demand drivers that will wake the sleeping giant that is uranium. And as demand soars, North America is sure to play a key role in the future of uranium supply. In North America—and even from a global standpoint—there is no better place to explore for uranium than Saskatchewan's Athabasca Basin, which is to uranium what Saudi Arabia is to oil. Two of the largest producing uranium mines in the world—McArthur River and Cigar Lake--are in the Athabasca Basin. In and around this area, where Canada's Cameco is the key player, junior IsoEnergy is focusing on new exploration and development at Thorburn Lake, Radio, North Thorburn and Madison.

(Continued on Page 7)

Trump Could Fuel A Nuclear Energy Boom In 2017



Now that Trump is president-elect, the speculation is that Trump will make good on promises to reform the licensing and permitting processes for nuclear power plants. What this means is that we could be sitting right on the edge of a revolution in next generation nuclear technology. This means a major push for next-generation nuclear projects such as PRISM, the brain-child of General Electric and Hitachi. So not only does demand for uranium across the next two decades seem assured, it is poised to paint an attractively tight supply picture in the coming decades. As the New Year is ushered in, falsely negative sentiment on uranium is likely to be ushered out the door and the real fundamentals will become more visible.

The bottom line is this: While uranium prices have been on a very long and gradual decline for some 13 years, analysts agree that they've reached their bottom and the climb back up is poised to be a lot faster than the decline. Trump is all about harnessing untapped potential, and as atomic energy advocates are quick to point out: Nothing has more untapped potential on multiple fronts than nuclear energy, and right now is the time to buy into quality assets while uranium is at a multi-year low but at the early stage of a bull market.

By James Stafford - OilPrice.com

Georgia Power Places Nuclear Reactor Vessel at Plant Vogtle

Georgia Power placed the first nuclear reactor vessel in the state of Georgia in more than 30 years at the Plant Vogtle expansion project near Augusta. The 306-ton nuclear reactor vessel was lifted into its permanent location inside the Unit 3 nuclear island on Nov. 23, using one of the largest cranes in the world—a heavy-lift derrick with a 560-foot front boom. Construction contractors Westinghouse and Fluor Corp. performed the lift. The reactor vessel was fabricated by Doosan Heavy Industries in South Korea, arrived at the Port of Savannah, and was shipped to the construction site by train on a specialized rail car. Standing 35 feet tall, the reactor vessel functions as a heat source from the nuclear fission process to produce steam that will generate electricity for homes and businesses throughout Georgia. "The safe placement of the Unit 3 reactor vessel, the first to be placed in our state in decades, inside the nuclear island is a tremendous milestone for the Vogtle project," said Mark Rauckhorst, executive vice president of construction. "With this placement, the unit is one step closer to completion and entering service." This achievement is the latest in a series of recent construction highlights, including the placement of the CA01 module for Unit 4 on Nov. 21 – the project's second-heaviest lift. The CA01 module weighs more than 2 million pounds, or 1,000 tons, and stands 70 feet tall, 95 feet wide, 80 feet long and was assembled on site at the project's 12-story Module Assembly Building. The CA01 module, made entirely of steel, will house two steam generators for Unit 4, in addition to other equipment. Visit Georgia Power's YouTube site for time-lapse videos of the CA01 and reactor vessel placements. Other recent milestones include: Assembly of the squib valves for both units; The placement of the 2 million-pound Unit 4 CA20 module; The setting of the roof trusses for the Unit 3 turbine building which brings the building to its final height of 254 feet. The expansion at Plant Vogtle is part of Georgia Power's long-term, strategic plan for providing safe, clean, reliable and affordable energy for Georgians well into the future. Once Units 3 and 4 join the existing two units already in operation, Plant Vogtle is expected to generate more electricity than any current U.S. nuclear facility, enough to power more than one million homes and businesses in Georgia. Southern Nuclear, a unit of Southern Co., is overseeing construction and will operate the two new 1,100 MW AP1000 units for Georgia Power and co-owners Oglethorpe Power Corp., the Municipal Electric Authority of Georgia and Dalton Utilities. Georgia Power owns 45.7 percent of the new units.

By Editors of Electric Light & Power/ POWERGRID International

Illinois Energy Bill Becomes Law

Dec. 8, 2016—Senate Bill 2814, the Future Energy Jobs bill, was passed by the state legislature on 1 December, the final day of both houses' 2016 veto sessions. The bill will see Illinois expand clean energy production while protecting jobs and maintaining competitive electricity rates, with caps and protections to limit the impact on consumers and businesses. It recognizes the contribution of nuclear power generation to the state's zero-carbon emission generation and ensures that the Clinton and Quad Cities nuclear power plants can remain open. Without the legislation, both plants had faced closure. Exelon said it plans to operate the Clinton and Quad Cities plants for at least another ten years as a result of the bill. "This historic legislation will protect the state's primary source of clean energy while saving thousands of good jobs at our plants and providing millions of dollars in low-income assistance, as well as job training in communities that need it most," CEO Chris Crane said. Rauner thanked those who had negotiated "in good faith" to make the bill a reality. "This bill ensures we don't gamble with thousands of good paying jobs and gamble with our energy diversity," he said.

Researched and written by World Nuclear News

Illinois Lawmakers Pass Legislation Recognizing Nuclear's Clean Air, Economic Values

(Continued From Page 1)

positions Illinois as a national leader in advancing clean energy, and will provide a major boost to the Illinois economy." "Today marks a significant victory for the state of Illinois, the families and businesses that live and work here, and the health of our environment," Crane said. "We encourage the governor to swiftly sign the legislation into law."

The legislation includes provisions to secure competitive electric rates for Illinois ratepayers, preserve and create jobs, and spur investment in clean energy and energy efficiency across the state.

Exelon praised the efforts of more than 200 business, labor, environmental, faith-based and other groups, including the AFL-CIO, International Brotherhood of Electrical Workers, Chicagoland Chamber of Commerce and Illinois Retail Merchants Association. It also had support from members of the Illinois Clean Jobs Coalition, including the Citizens Utility Board, Natural Resources Defense Council, Sierra Club and Environmental Defense Fund among other environmental groups. Illinois' legislation joins New York's Clean Energy Standard in demonstrating a growing recognition among the states that nuclear energy is a necessary component of any plan that includes reducing emissions in the electricity sector.

The Clinton and Quad Cities facilities provide about 23 percent of Illinois' emission-free electricity. Between them, they prevent the emission of more than 20 million metric tons of carbon dioxide a year, the equivalent of taking nearly 5 million cars off the road. The economic profile of retaining the two plants is also significant, preserving more than $1.2 billion in annual economic activity across Illinois, including 4,200 direct jobs at the two plants and thousands more jobs that the plants support.

Joe Dominguez, Exelon's executive vice president of governmental and regulatory affairs and public Policy, noted the dual strengths of the plants, noting that they "prevent significant carbon emissions and serve as economic engines for the state and the communities in which they operate."

Exelon had said earlier this year that it would close the Clinton and Quad Cities facilities in Illinois absent a legislative solution that correctly valued nuclear energy for its clean air and economic contributions. Well-operating nuclear power plants in numerous states are under financial stress as a result of weak market conditions and the fact that their environmental and reliability attributes are not fully valued. The passage of the Future Energy Jobs Bill ensures the plants will not face that outcome.

Palisades Power Plant to Shut Down Permanently in 2018, Impacts 600 Jobs

(Continued From Page 3)

ciated with strategic transactions that Entergy or its subsidiaries may undertake, including the risk that any such transaction may not be completed as and when expected and the risk that the anticipated benefits of the transaction may not be realized and (h) the effects of technological changes and changes in economic conditions and conditions in commodity and capital markets during the periods covered by the forward-looking statements. The Palisades Power Plant employs about 600 workers, and has been a part of the Van Buren County community since it began generating electricity in 1971. The plant generates 811 megawatts of virtually carbon-free electricity, enough to power more than 800,000 homes. Additional information on today's announcement is available at www.entergy.com and www.palisadespower.com. U.S. Rep. Fred Upton, R-St. Joseph, today released the following statement on the announcement that Palisades Nuclear Power Plant, owned by Entergy Corporation and located in Covert, Michigan, would be decommissioned and closed in 2018: "Palisades has been part of the fabric of our Southwest Michigan community since 1971. They've employed thousands of workers – who in turn became respected leaders and so it's important we do not turn our back on these hardworking folks now. They've also invested in our local schools and charities, had an enormous positive impact on our economy, and powered homes and businesses throughout the Midwest. But, as with all nuclear power plants across the country, there is always an end date. This safe transition is governed by the Nuclear Regulatory Commission and should not be interfered with. I strongly urge Entergy to remain committed to our community and I will continue working with them throughout this time of transition."

WSBT 22 News

Closing the Fuel Cycle, The Ultimate in Recycling Recycle

Sept. 8, 2016—Closing the Fuel Cycle, the ultimate in recycling recycle and re-purpose materials extends the life of landfills, saving everyone money. It also is the right thing to do. But when it comes to the used nuclear fuel from our commercial reactors, our long-range plan is simply to bury it. That has been our policy for decades, but changing the policy may be something the next president can bring about. We have in this country more than 70,000 tons of used fuel stored at more than 75 sites in 33 states, and the 100 U.S. commercial reactors produce about 2,000 additional tons of used fuel each year. Because we don't recycle this nuclear material, it would take nine Yucca Mountain repositories by the turn of the next century to house all of the used fuel being produced. Getting one Yucca has proved daunting, let alone nine. In the meantime, dozens of states like Georgia and South Carolina spend hundreds of millions of dollars to let the material sit in highly engineered casks and pools at plant sites. And these have to be replaced every 100 years – for about 1 million years. Definitely not sustainable. France's Areva operations representative in the United States, said, "It's a travesty to leave this waste to future generations when we can be extracting more energy from it now and reducing the toxicity from 10,000 years to 100 years." And Areva should know because the French took the uranium-filled fuel rods and figured out how to safely reuse 96 percent of the material. By separating the uranium and plutonium from the fission products, they take advantage of all of the energy left in the material. More importantly, they turn the remaining 4 percent of waste into an inert glass product that requires minimum security and safeguard protocols. If we did that here in the United States, it would significantly reduce potential waste going into a Yucca Mountain and extend the facility's life. So how is it that the U.S. would not want to do the same?

The Energy Times, Tim Echols

Retaining and Sustaining Nuclear Knowledge

Nov. 16, 2016 - Many of the world's existing nuclear power plants are aging and owner-operators need to consider options of life-extension, refurbishment or decommissioning. At the same time, the operators of these facilities are experiencing a steady stream of retirements. It is important for the nuclear energy sector to ensure that there is always a well-trained workforce capable of fulfilling the responsibilities for the ongoing effective and safe management of the global fleet of nuclear power plants. These are among the key topics being addressed at the Third International Conference on Nuclear Knowledge Management — Challenges and Approaches, commencing today. "Effective knowledge management is vital for the success in all industries, and especially in the nuclear sector. A nuclear power program requires a long-term national commitment of people and resources and it is essential that specialist knowledge is shared and maintained," said Yukiya Amano, IAEA Director General in his opening address to over 500 delegates attending the event. For a complex scientific industry, retaining skills, and sharing experiences and knowledge are vital for its sustainability and growth. Currently, 450 nuclear power reactors are operating in 30 countries. Many of these plants will or have reached their licensed design life and are being refurbished or upgraded to extend their operations. At the same time, there are another 60 reactors currently under construction world-wide. All this requires global efforts to ensure continuity in having strong and effective technical and scientific knowledge in this specialized field. Highlighting the importance of this, Mr Amano said: "Even in countries that are phasing out nuclear power, critical knowledge must be maintained in order to ensure that decommissioning and environmental remediation of sites are carried out in a responsible manner." He further emphasized the need of ensuring the availability of highly qualified staff to assume responsibility for the safe, secure and sustainable operation of nuclear facilities in the coming decades. "We also need to ensure that critical knowledge is not lost when experts retire."

The Conference will also address the issue of developing and maintaining necessary knowledge for a robust safety program and safety culture when using nuclear technology. This requires an adequate technical knowledge base and a wide range of specialized competencies. Knowledge management also needs to be effectively coordinated and integrated across all phases of the nuclear technology lifecycle as both organizational and operational conditions can change when using nuclear equipment, installations and facilities. A proactive approach is needed to ensure due diligence. The weeklong meeting will explore global efforts to support the next generation of professionals to gain advanced and specialized knowledge in nuclear engineering and science, which is required for the safe and effective design, construction, licensing, commissioning, operation, maintenance, and decommissioning of nuclear technology-based systems. To support Member States, the IAEA has developed a number of programs in nuclear knowledge management. The Nuclear Knowledge Management School and the Nuclear Energy Management School (established in 2015 and 2010 respectively) have trained a large cadre of young nuclear professionals. The International Nuclear Management Academy (INMA) is an initiative launched by the IAEA in 2013 to support universities that offer Master's program in nuclear technology management and through which nuclear professionals obtain a better understanding of the technologies, roles and responsibilities required for the design, construction, operation and maintenance of nuclear facilities. "The challenges of sharing and transferring nuclear knowledge are not limited only to the energy sector. Nuclear technology is utilized in a range of industries including, for example, medicine and agriculture, and the technology makes a significant difference to mankind. We see opportunities to further ensure that nuclear knowledge is safely utilized and is preserved and shared for peaceful uses," said John de Grosbois, Head of the IAEA Nuclear Knowledge Management Section. "Member States are looking for more proactive and integrated lifecycle approaches to ensure the sustainability of nuclear knowledge." Presentations at several sessions in the conference will focus on industry-wide challenges such as managing the complexity of design knowledge for nuclear plants over the long periods of their operational life and lengthy decommissioning processes. The event is expected to create better awareness among operators and regulators and other stakeholders of the latest best practices in knowledge management and the need for continued strategic leadership in this area. The first nuclear knowledge management conference held in 2004 in Saclay, France focused on how to fill the gap of an entire generation of experts retiring in the near future. The second conference in 2007 in Vienna saw a more proactive approach to develop concrete processes to address various technical knowledge gaps facing the nuclear industry. This current conference builds on the outcomes of first two, with the aim of helping Member States realize the benefits of a more integrated and strategic approach to nuclear knowledge management by creating and maintaining a strong nuclear knowledge base over the entire technology lifecycle.

NWI Products And Services

NWI Consulting, LLC
PO Box 33117, Knoxville, TN 37930
Office: (865) 385-6166 Fax: (888) 817-8890
Website: www.nwi-llc.com
Email: nwi@nwi-llc.com

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, Work Control, Outage Management, Performance Improvement, 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, NRC 95-003 Preparations and specialized Safety Analysis (50.59).

NWI News Update

The following key activities are being conducted by NWI professionals...

- Grand Gulf Nuclear Station - Training & Startup support
- River Bend Station - Operations Procedure Updates, Performance Improvement/CAP
- Arkansas Nuclear One–Nuclear Safety Culture, Corrosion Control, PN14 and 95003 Recovery, Performance Improvement/CAP, Maintenance, QA/NOS, Operations Support
- Entergy - Nuclear Sustainability Project
- EPRI - Nuclear Offsite Power Study
- EPRI - Offsite Power Critical Equipment Scoping Guideline Development

Editor: Frank S. Tsakeres
NWI Director of Operations

Associate Editor: Kate Hendrickson
NWI Director, Marketing