



NRC APPROVES FINAL RULE ON USED FUEL STORAGE

27 August 2014. The issuance of licenses for new US nuclear power reactors and the extension of operating licenses for existing ones will soon resume following the US Nuclear Regulatory Commission's (NRC's) approval of a final rule on the continued storage of used fuel. The rule updates the NRC's 2010 "waste confidence" decision which doubled the period allowed for onsite storage of used fuel to 60 years but was then overturned by the US Court of Appeals for the District of Columbia Circuit in June 2012 because it said the agency had failed to consider what would happen if a repository is never built, or the environmental impact of potential fires and used fuel pool leaks at nuclear power plants. The NRC responded to the court ruling by suspending final licensing decisions on new reactors, reactor licence extensions and used fuel storage facility licence renewals. The commission directed NRC staff to develop a new rule and a supporting generic environmental impact statement (GEIS) within two years. Following the publication last month of its draft final rule and GEIS on the continued storage of used fuel, the NRC has now approved the final rule and GEIS.

The rule adopts the findings of the GEIS regarding the environmental impacts of storing used fuel at any reactor site after the reactor's licensed period of operations. The NRC said, "As a result, those generic impacts do not need to be re-analyzed in the environmental reviews for individual licenses." The NRC stressed, "The rule does not authorize, license or otherwise permit nuclear power plant licensees to store used fuel for any length of time." It added, "When warranted by significant events that may call into question the appropriateness of the rule, the commission will review the GEIS and the rule to determine if revisions are necessary." The Washington DC-based Nuclear Energy Institute (NEI) welcomed the NRC's final rule. It said, "The affirmation supports the nuclear energy industry's position that used nuclear fuel from commercial reactors can be safely managed in specially designed fuel pools in the short term and in steel and concrete storage containers for longer timeframes."

Licensing activities—Separately, the NRC also issued an order lifting the suspension of final licensing decisions. The order authorizes the NRC staff to issue final licensing decisions "as appropriate" once the final rule becomes effective, which will be 30 days after publication in the Federal Register, expected next month. A total of 24 licensing actions have been affected by the two-year suspension. These include applications for 12 combined construction and operating licenses for new reactors, one operating license, eight reactor operating license renewals, two renewals of licenses for used fuel storage facilities and one early site permit. Just two of the actions - license renewals for units 1 and 2 at Exelon's Limerick plant and the renewal of the license for the used fuel storage facility at Calvert Cliffs - are awaiting final decisions. The NRC said, "The results of the continued storage proceedings must be accounted for before finalizing individual licensing decisions. But once the staff has otherwise completed its review of the affected applications and has implemented the continued storage rule as appropriate for each affected application, it may make decisions regarding final license issuance."

Researched and written by World Nuclear News

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World's Nuclear Energy Shifts to Asia - Russia's Rosatom

Asia currently hosts most of the world's nuclear plants currently under construction, as nuclear energy gradually shifts from Europe and the US to Asia, Sergei Kirienko, head of Russia's state nuclear corporation Rosatom, said Monday. "Last year, here at the forum, a forecast was made for a geographical shift in nuclear energy, with the countries in Asia taking a larger share. Today, we can clearly see that. While the majority of functioning nuclear power plants are located in Europe and the US, more than half of the nuclear power plants under construction are in Asian countries," Kirienko said at the Atomexpo 2014 international forum in Moscow, which took place June 9-11. Kirienko told journalists Rosatom views the Asia-Pacific market as a priority for the Russian nuclear industry. According to the International Atomic Energy Agency (IAEA), 72 nuclear plants are being built this year – ten more than last year, Kirienko said. (Federal Agency for Atomic Energy (Rosatom) September 9, 2014, (MOSCOW (RIA Novosti)).



NRC approves nuclear waste storage to allow TVA to proceed with Watts Bar



The Nuclear Regulatory Commission approved a plan Tuesday to allow nuclear wastes to be stored on site at nuclear plants, ending a two-year suspension of new plant licenses over waste concerns and clearing the way for the Tennessee Valley Authority to add another reactor at its Watts Bar Nuclear Plant. The NRC vote on the controversial rules for radioactive waste disposal came in response to a 2012 federal court ruling that struck down the previous nuclear waste approach. The court ordered the NRC to re-evaluate its waste rules after the Obama administration in 2010 quit building a permanent storage repository at Yucca Mountain in Nevada that was supposed to handle nuclear wastes from U.S. reactors. The NRC's final rules adopted

Tuesday allow radioactive wastes generated from reactors to be stored in spent fuel ponds or dry storage casks at each of the 103 commercial reactors in the United States. TVA has stored nuclear wastes in dry casks for the past decade at both its Sequoyah and Browns Ferry nuclear plants. But the federal utility needed NRC approval for new on-site storage to proceed with the licensing of the Unit 2 reactor at Watts Bar. Anti-nuclear groups had urged the NRC to delay Tuesday's vote until outgoing commissioner Bill Magwood -- who critics claim had a conflict of interest because of his future job -- could vote on the measure. The NRC board and Magwood insisted the time had come for a final vote on the generic environmental impact study released last year.

TVA welcomed the decision to allow storage of nuclear wastes at each plant so that TVA can proceed with securing regulatory approval next year to load nuclear fuel and begin power generation by December 2015 at Watts Bar Unit 2. "It's certainly encouraging to get this decision made," TVA spokesman Duncan Mansfield said. "We'll have to see what happens from here." Tuesday's ruling, which is still subject to public review over the next month before it becomes effective, should allow the NRC to move ahead with new licenses and license extensions, which have been on hold since August 2012. "The completion of this rulemaking is an important step that will facilitate final decisions on industry licensing actions," said Ellen Ginsberg, general counsel for the nuclear industry trade group, Nuclear Energy Institute. Environmental critics questioned the NRC vote and indicated they may appeal the decision. "The Nuclear Regulatory Commission failed to analyze the long-term environmental consequences of indefinite storage of highly toxic and radioactive nuclear waste, the risks of which are apparent to any observer of history over the past 50 years," said Geoffrey Fettus, lead counsel for the Natural Resources Defense Council. Environmental groups may again sue the NRC, which could lead to a lengthy court battle that might delay the startup of the Watts Bar plant if a court again directs NRC license decisions to wait on new waste disposal rules. Mary Olsen, southeast regional coordinator for the Nuclear Information and Resource Service, blasted the decision to allow continued storage of nuclear wastes throughout the country. "This waste is lethal for centuries and causes cancer, infertility, birth defects and other harms to members of the public, as well as every other life form exposed," she said. But Mansfield said dry cask storage "is an accepted standard across the industry." "The casks are designed to withstand earthquakes, flooding and other potential issues," he said.



(Times Free Press, August 27, 2014, by [Dave Flessner](mailto:dflessner@timesfree press.com) (dflessner@timesfree press.com)).

Fears about Palisades Nuclear Plant offset by money, talent it pumps into Southwest Michigan economy

By Julie Mack | jmack1@mlive.com The Kalamazoo Gazette , on August 24, 2014 at 6:15 AM, When Consumers Power Co. announced plans in the mid-1960s to build a nuclear power plant near South Haven, fears about nuclear energy were largely offset by excitement of what the plant would mean for the local economy. A half-century later, the same dynamic prevails. While anti-nuclear activists clamor to shut the plant down, government and business officials say the Palisades Nuclear Plant plays an important role in the region's economy. Consider:

- Palisades is the Van Buren County's largest taxpayer, paying \$11.2 million in property taxes in 2013. The plant comprises 8 percent of the tax base in the county and 37.5 percent of the tax base in Covert Township, where the plant is located.
- After MPI Research in Mattawan, Palisades is the county's second-largest employer, with more than 600 full-time workers. And despite the layoff of about 30 employees last year, Palisades still has about 100 more workers today than it did when the plant was sold by Consumers to Entergy Corp. in 2007.
- With an annual payroll of \$71 million, Palisades provides the kind of high-skill, high-wage jobs that communities crave. The average wage at Palisades is almost twice the county average for full-time workers.
- Entergy contributes about \$350,000 a year toward nonprofits and community events in the South Haven area, making it a significant community partner, local officials say.

"It's not just what they pay in taxes," said Van Buren County Administrator Doug Cultra. "It's also the number of jobs, and the depth and breadth of people they bring into the community. Most importantly, Cultra said, Palisades brings in an infusion of highly skilled professionals who tend to be pillars of their community, "the kind of people who run for school board and serve as Little League coaches. ... These are high-caliber people." In addition, Palisades is a welcome source of hundreds of high-paying jobs in a county where the poverty and unemployment rates are above the state average, and where the average household income is below the state and national averages. "Our county is largely rural and agricultural," Cultra said. The average annual wage in Van Buren County was \$38,000 in 2013, according to the federal Bureau of Labor Statistics. By comparison, the average salary at Palisades is about \$63,000, according to www.simplyhired.com, a website that tracks wages. "If we were to lose (Palisades), there would be a huge impact" to the South Haven-area economy, said Kathy Wagaman, executive director of the South Haven Area of Commerce. "You don't replace those kinds of jobs these days. ... Those are jobs that support a household." Wagaman said the importance of Palisades goes beyond the 600-plus full-time workers. During refueling, which occurs about every 18 months, the plant also brings in a thousand or more temporary employees for about six weeks. That alone is a welcome influx of money in a community heavily dependent on seasonal tourism, Wagaman said. "Bringing in contract workers during the off-season is a big help to the local economy," Wagaman said. Another impact of Palisades is their support of local nonprofits and community events, Wagaman added. "We just finished with the Blueberry Festival, and they were one of the sponsors," she said. "They give to organizations like Habitat for Humanity. They're very generous."

"We're all beneficiaries of Palisades being here," she said. Economist George Erickcek, a senior analyst for the W.E. Upjohn Institute for Employment Research, said a big reason that Palisades is so important is that it brings outside dollars into the area, unlike employers such as hospitals that largely recirculate money already in the community. "If Palisades closes, it's very unlikely there would be another power plant taking its place," and its highly skilled workforce would leave to find jobs elsewhere, Erickcek said. "That's why these jobs are so important and why, if Palisades closes, it would be missed." A natural-gas-fueled power plant, New Covert Generating Co., opened near Palisades in 2004 but it only employs 30 full-time workers. The biggest downside to having Palisades in the South Haven region is the risk associated with nuclear power plants. Nobody wants to be the next Chernobyl or Fukushima. Southwest Michigan residents addressed those concerns at June meet-

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ing in South Haven with the Nuclear Regulatory Commission. "I'm very concerned about any releases or leaks in the air," said Lorraine Koenes of Grand Rapids. "I'm concerned about all radiation." South Haven City Manager Brian Dissette said local officials are "extremely aware" about the need to have emergency plans in the event of a major incident at Palisades. "Our first responders have weekly conversations about that," Dissette said. In the past few years, as Palisades has experienced more problems and new people have moved into the plant's communications office, Palisades now has a monthly conference call with local government officials to keep them in the loop "about what's going well and what the problem areas are," Dissette said. "Palisades has been good in talking with us about 'what if' scenarios," he said. Erickcek noted that closing the plant wouldn't necessarily eliminate the risk, since the spent fuel likely would remain on site. When Entergy agreed last year to close its Vermont Yankee plant near Brattleboro last year, many residents cheered -- only to discover it could take decades to decommission the plant." All things considered," Erickcek said, "you'd rather have Palisades open than not open."

CHINA NUCLEAR COMPANIES PLANNING TO POWER UP EXPORTS

There's a saying in the nation's atomic industry that one reactor sold abroad equals 1 million cars. China's goal of exporting nuclear reactors seems within reach, as domestic makers of these power stations are establishing a complete industry chain, company officials and engineers said. Involvement by Chinese companies in foreign projects has been expanding but mostly in the form of project financing rather than contracts to design, build and operate nuclear plants. Even a recent foray into Argentina, related to construction of a pressurized heavy-water reactor at the Atucha plant, is limited to providing equipment and services under long-term financing. An agreement was signed between China National Nuclear Corp and Nucleoelectrica Argentina SA during President Xi Jinping's state visit in July. But China's nuclear companies have global ambitions for their proprietary technology. "It seems that CNNC hopes to take advantage of this deal to open up other nuclear opportunities with China's domestic technology in Argentina," said Zhang Luqing, a nuclear expert and power project manager with almost a half-century of experience. He said that China has the technology ready to export, and it can benefit from doing so in many ways. Exporting plants will help domestic manufacturers improve their technology levels and recover the huge costs of research and development. The United Kingdom will be the likeliest place to locate a nuclear project entirely owned by Chinese companies. A bilateral agreement allows companies from China to build, own and operate nuclear power plants in the UK. The British government said it is committed to the development of nuclear energy to provide a sustainable, low-carbon electricity supply, with a target of adding 16 gigawatts of installed nuclear capacity by 2030. It has confirmed a list of eight new sites deemed suitable for nuclear power stations by 2025. Yang Maochun, project manager in charge of the UK market at China General Nuclear Power Corp, said the UK offers a substantial market opportunity. Yang said the company will cooperate with French power giant Electricite de France SA to invest in the UK project, which is the Hinkley Point C in Somerset, southwest England. CGN has had a long-standing partnership with EDF, which helped develop two Areva-designed European pressurized reactors in Taishan, Guangdong province, where CGN is based. CNNC, a bigger player, will also be bidding for construction of nuclear reactors in the UK. Last year, the UK government gave approval for CGN and CNNC to invest in the \$2.6 billion Hinkley Point C project for a combined stake of 30 to 40 percent. The project involves a two-reactor, 3.2-GW station led by EDF. An industry insider at a UK-based nuclear company said that because the UK is a developed market, winning a bid to build a nuclear station will give the two Chinese companies global recognition. But he warned that hurdles remain, because the UK has very strict nuclear regulations and there are still concerns about whether Chinese companies should be allowed to own majority stakes in the new plants. "The lack of international business experience and a long-term market strategy will constrain the development of Chinese companies making inroads into these countries," he said. But he added that if the two companies could form an alliance or set up a joint venture in the UK, they would have better chances to win bids. (Lyu Chang (China Daily) Updated: August 26, 2014).

Improving Management Accountability



A Harvard Business Review study revealed 46 percent of high-level managers were rated poorly when it comes to their ability to hold employees accountable. Another study, this time from Towers Watson, noted that 24 percent of companies responding to the survey gave bonuses and other compensation to employees failing to meet even the lowest possible performance rankings. The macro-level picture isn't a pretty one, according to Victor Lipman, a *Forbes* contributor. He says a significant number of managers are not holding employees sufficiently accountable, and a significant number of companies are rewarding employees when they don't perform. From a management standpoint, this is a lose-lose situation. The company pays out unnecessarily, and employees are rewarded for doing nothing more than sitting on their laurels. This is particularly problematic, as it can encourage non-productive behavior in otherwise productive employees. There are five possible solutions, Lipman says, including: Eliminating dysfunctional compensation policies, making annual objective-setting a serious business function, making candid evaluations a priority, avoiding a conflict-avoidance attitude and holding leaders accountable. (*Forbes*, May 5, 2014 by Victor Lipman).

Perry Nuclear Power Plant vice president speaks to business community on continued investment

With a renewal licensing process by the Nuclear Regulatory Commission looming over the next decade, the head of the Perry Nuclear Power Plant is reinforcing his company's commitment to investing in Lake County. The operating license at the more than 27-year-old power plant doesn't expire until 2026, but FirstEnergy officials plan to submit a 20-year renewal application in September 2015, said spokeswoman Jennifer Young. Ernie Harkness, vice president of FirstEnergy Nuclear Operating Co. and overall manager of the Perry Nuclear Plant, served as guest speaker to business and community leaders May 27 during a Mentor Chamber of Commerce meeting at Holiday Inn Express Hotel & Suites LaMalfa in Mentor. He discussed the power plant's local impact in the community, including its contribution of \$14 million in local and state taxes and in employing 799 full-time workers, 98 percent of which lives in either Lake, Geauga or Ashtabula County. "And that's just the in-house folks," Harkness said. "There's probably anywhere from 200 to 300 contractors (at the plant) at any given time."

Harkness, a Mentor resident, joined FirstEnergy in August following 30 years working for other energy companies, mostly in the nuclear industry. Harkness replaced retired Vice President Vito Kaminskas. August was the same month the Nuclear Regulatory Commission moved the plant up to a Licensee Response Column 1, requiring the least amount of government oversight. The plant had before that been marked as a Degraded Cornerstone Column 3 because of incidents that had raised employee safety concerns. Since then, Harkness said he has worked on improvements in the "efficiencies" of responding to regulatory or industry demands.

"We're also coordinating our response to the regulations that have come down from the Fukushima earthquake," Harkness said. That includes investing \$20 million in additional portable and pre-staged equipment at the plant, he said. At the presentation, Harkness said part of his job is to ready a new generation of workers at the plant because many baby-boomers are preparing for retirement. He said the average age of the plant's workforce is 47 and he's hired 35 employees this year alone.

(News-Herald, Perry Nuclear Power Plant, By Simon Husted, The News-Herald, May 27, 2014).

China's nuclear boom leaves Germany isolated



Japan's nuclear industry came to an abrupt halt on March 11th, 2011, when first an earthquake and then a tsunami hit the country's east coast, killing thousands of people. In Fukushima power stations, the reactor cores melted. It was the most severe nuclear disaster since the super meltdown of Chernobyl in 1986. After the shock, the Japanese government declared nuclear energy unsafe and switched off all of the country's reactors. Now, three and a half years on, one thing is clear: nuclear energy is for now indestructible – even in Japan. The Japanese people may not fully trust it any longer, but they also no

longer want to accept the high energy prices which have existed since the atomic phase-out. Renaissance of nuclear energy in Japan High cost is one of the arguments used by the Japanese government to justify the decision to switch the country's nuclear reactors back on again. Sendai power station on the southern island will be the first in a few weeks' time. Others will follow. Brazil, India, China and Russia are also expanding their countries' nuclear energy infrastructure. An increasing number of countries has even decided to start adopting nuclear energy; among them Turkey, Bangladesh, Egypt, Jordan, Nigeria and Vietnam. Even the United Arab Emirates started building a nuclear power station, Belarus and Finland, too. Argentina is on the list - and Saudi Arabia, of all places. Even Germany's direct neighbors have their own idea of energy supply: France, Britain, and Poland continue relying on nuclear power. 72 nuclear power stations are currently being built, according to the International Atomic Energy Agency, IAEA. Germany's futile role model attempt Germany is pretty isolated with its intention to phase out nuclear power. The decision for a complete exit was made hastily in the Fukushima aftermath, with Germans reacting almost as shocked as the Japanese. Of course, the Germans knew that nobody in Europe would follow suit any time soon. But the new-born anti-nuclear power campaigners in Berlin had one good argument: somebody had to take the lead and act as a trailblazer. After all, the world tends to be receptive to German ideas, German technology and German soccer. Right? But so far, Germany has failed to convince others of the advantages of a nuclear exit. On the contrary: the current trendsetter is China. Beijing aims to increase the number of nuclear power stations in the country from a current 15 to 71 by 2020. The amount of nuclear electricity is to rise from a current 13 gigawatts to 160 gigawatts by 2040. Compare this to the US, which currently produces 101 gigawatts of energy with nuclear power. Within one generation, China is poised to become the world's top nuclear nation. And there's an easy explanation. There is hardly any region along China's entire east coast and also in the heavily industrialized south where air pollution doesn't reach alarming levels at least a few days per month. Beijing also invests in renewable sources of energy – China has long become the top global player in wind energy as well as solar power stations. But China's 1.3 billion people are hungry for energy: the economy continues to grow, and new cities and new industries mean demand for electricity keeps rising. So far, electricity is mainly generated by coal power, a heavy pollutant. Today, China alone consumes almost as much coal every year as the rest of the world taken together. This has led to a devastating situation. The Chinese government is caught between a rock and a hard place. It has to make the choice between the pervasive risks of coal and the potential risks of nuclear energy. The latter is a risk that Beijing seems to prefer to take for now. In China, there's a widespread belief that nuclear energy is the only way for now to avoid suffocating from smog. Siemens and other German suppliers meanwhile have no chance of benefiting – they are bound to Germany's nuclear phase-out – even if atomic reactors built by German engineers were always considered the safest in the world. (DW's columnist Frank Sieren, August, 27, 2014, Deutsche Welle (www.dw.de/))

What is real power?

Leadership just isn't what it used to be. Thank goodness! We've all known of organizational cultures where the managers' use of command and control is a source of power. Because we are now in an age of flattened organizational structures, global broad based knowledge, and speed-of-light decision making, real leadership power lies in work relationships that are formed and intentionally sustained.

In the next 20 years, we'll see more change in how managers lead. Although here are still pockets of managers who grasp for power through force and strength, they'll leave and be replaced with a new type of manager. This manager will

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be adept at real power. They'll share influence by being a catalyst to bring out the best in their stakeholders and organizations. They'll focus on others as a significant investment as opposed to simply checking off items on a "to do" list. The managers who are adept at force and control will not survive, except perhaps in rare cases where safety and security may be necessary. Up and coming managers: be ready! Your time will come to lead on a bigger scale and change the world! You might as well begin learning about how to have real power now. Your real power is in: Relationships: Always pay attention to the relationships you need to foster that are mutually beneficial. Develop them, sustain them, and mend them as necessary. This doesn't mean you have to be best friends with those you lead; it simply means that you need to be able to work with each other for the common good. You don't even have to like each other, but you do have to clean out your personal closets of assumptions, judgments and beliefs to be able to achieve together. Be honest and foster trust at all times, especially when you disagree. Collaboration: Gone are the days of competing with internal (and sometimes external) stakeholders to foster creativity or to get you want. Collaboration is the new currency in the sense that it goes miles beyond cooperation (which generally means to "go along" even though you might disagree). When you collaborate, you leave behind your self-interest to achieve goals for the greater good. Embrace collaboration and model it for others. Equality: Real trust doesn't happen without a sense of equality between leaders and stakeholders. Inequality is behind the use of force, fear, coercion or control, and it breaks trust. When that happens, lost revenue or missed opportunities aren't far behind. Don't put yourself "above" others by judging them to be something less than yourself. Everyone has a stake in organizational success, and when you lead in the spirit of equality, trust and success will follow. Conversation: All ideas, progress, relationships and success are built on a foundation of conversation. Yet, when you are so focused on getting things done, you may forget that the people doing the work need dialog to be their best. Stop and think often about the conversations you need to have; then, have them! You can't lead alone, and powerful two-way conversations are crucial to making the right decisions. Coaching: Consider what our organizations will become when every leader believes that coaching others is an imperative instead of a time-waster. Coaching grows people, and when people grow, organizational performance thrives. One of your real powers is knowing how and when to coach others. When you coach, you are able to watch the expansiveness for thought, creativity, and innovation that occur in others. You can revel in the impact this has on your organization. We're at the precipice of a new time that calls for new kinds of power. Embrace these new sources of power and watch your organization flourish! (By Mary Jo Asmus, July 16, 2014).

Exelon seeking compensation for Illinois nuclear plants

Exelon told investors Thursday it expects to be compensated for costs incurred by all of its nuclear plants in Illinois, not just the plants that are in danger of closing. In a conference call after the power company released second-quarter earnings, Exelon officials noted that Illinois lawmakers are currently drafting legislation that would help the state adhere to new federal rules aimed at cutting carbon dioxide emissions. Because nuclear plants produce no carbon, Exelon has been lobbying to highlight the environmental and economic benefits of its nuclear plants. Chicago-based Exelon, which owns six nuclear plants in Illinois, has signaled that as many as three of those plants could close if policies at the state and federal level don't help it increase profitability. Joseph Dominguez, senior vice president of government and regulatory affairs for Exelon, said it is too early to release details of what that legislation would look like. But he noted that "state agencies are drafting a number of reports that'll look at the economic value of the units to the local communities, jobs, the value of the energy produced." He said that he expects those reports to become available as early as November. The Environmental Protection Agency's aggressive goals of 30 percent greenhouse gas reductions from 2005 levels by 2030 give Exelon a strong hand in pushing rules that reward its nuclear plants. Closing just one of those plants would set the state back in its carbon-cutting goals. Exelon said it expects to wait until June 2015 before making any decisions about the fate of plants that are on the bubble. Previously, the company said it would make those decisions by year end. "It's pretty clear that if you're losing nuclear plants, your ability to comply with any carbon regime going forward is going to be jeopardized," Dominguez said. "The plants produce a tremendous amount of zero carbon energy, and so if you lose those, you're going to see a big uptick in carbon emissions. And we've seen that in states where plants have actually retired." Revenue at Exelon Corp. dropped to \$6 billion versus \$6.1 billion a year earlier in a quarter in which the company made several high profile deals to diversify a portfolio that relies heavily on nuclear power.

(Julie Wernau, Chicago Tribune, July 31, 2014.)

Seeing Cuomo's hand, or not, in a state move on Indian Point



Andrew Cuomo has long been on the record as an opponent of the continued operation of the Indian Point nuclear power plant in Buchanan, less than 50 miles from New York City.

But if a state proposal to shutter Indian Point for three months a year is part of larger plot to close the nuclear power plant permanently, as the owner contends, the governor isn't saying so. As *Capital* first reported, the state Department of Environmental Conservation quietly posted a plan on its website this month that would involve closing the plant for up to 100 days in the spring and summer in order to mitigate damage to Hudson River fish populations during breeding season. Such extended seasonal closures would certainly cut into the plant's profits—according to Entergy, the plant's operator, they would cost billions of dollars annually—and if they were put in place over the long term, could mean the end of Indian Point as a going concern. That, coupled with Cuomo's long-term pledge to close the plant, is the basis for an accusation from Entergy and its allies that this environmental-protection measure isn't what it seems to be. "This is not about science," said Entergy vice president Fred Dacimo during a public hearing on the issue earlier this month. "This is about closing what is a safe, clean, environmentally responsible facility that generates electricity in a cost-effective manner for New Yorkers." Indian Point needs state permits to use water from the Hudson River to cool its reactors and then discharge the warm water back into the river. After years of complaints from environmental groups like Riverkeeper, the state concluded that a billion fish a year were being killed through that process, and proposed that Entergy build cooling towers that would cost more than \$1 billion as a way to mitigate the problems. The new outage proposal, similar to one that was shelved by the state a decade ago, attempts to make full use of the state's limited leverage over plant operations. While it is up to the federal Nuclear Regulatory Commission to determine whether plants are licensed to operate, the state licenses the facilities' use of river water for operations, and can theoretically put a halt to operations by withholding or limiting permission on the basis of concerns over water quality. The proposal comes as nuclear facilities across the country feel the financial pressure of cheap natural gas produced by the fracking boom and after Entergy has already decided to close its Vermont Yankee facility for economic reasons. "I guess he feels in the end this is an excellent scheme," said Matthew Cordero, a former electric grid operator and a trustee of the Long Island Power Authority. "By reducing the capacity, you damage the nuclear power plant at the heart of its economic function." It would be a major power play, from a governor who sets his store by them. Matt Nelligan, spokesman for the Republican chair of the State Senate energy committee George Maziarz, told *Capital*, "It may be political. It's hard to imagine anything else since it doesn't make sense from a policy perspective." But if it's a political move by Cuomo, it's an unusual-looking one. While the governor is proud of his ability

to work the levers of power in Albany to achieve the results he desires, he's also famously deliberate about choosing his battles. And Indian Point is a battle that, for the past couple of years, he's largely avoided. If the proposal to mandate season shutdowns starting next year were truly meant to cripple Indian Point, it would represent the boldest assertion of political muscle by Cuomo in the service of that goal at least since his first year as governor, when his aides reportedly informed Entergy that the administration intended to work toward the plant's closure. Cuomo joined a suit against the N.R.C. for relicensing Indian Point when he was attorney general, and shortly after becoming governor he asserted that he intended to use the tool available to the state to keep the plant from continuing operation after its licenses expired in 2013 and 2015. But he never followed through in any steps comparable to this one, which would compel a prolonged shutdown. The D.E.C. proposal, if it in fact came at the direction of the governor, would be a departure from Cuomo's standard operating procedure in another way, too: There was no discernible attempt by Cuomo or his press people to call attention to the proposal, either through an announcement or a surreptitious leak to a friendly media outlet. If Cuomo had truly decided he'd found a way to outsmart the owners of Indian Point—if the D.E.C. proposal weren't, in fact, the result of a decision by bureaucrats to save some fish—he would normally be expected to make sure the voting public found out about it. The issue, a D.E.C. spokeswoman said, is the same one the state has had with Indian Point for years. In 2009, the state called for Indian Point to install cooling towers which recycle river water and dramatically lower the number of fish killed by the plant's operation. Entergy countered by proposing a much cheaper wedge wire screen system that prevents fish from getting sucked into the water intake system used to cool the nuclear reactors. The screen system—which, unlike a cooling-tower system, still entails heavy cycling of river water—hasn't been installed yet. Phillip Musegaas of Riverkeeper, the influential environmental group whose first prosecuting attorney was Cuomo's former brother-in-law Robert Kennedy Jr., said, "Entergy has needlessly fought the cooling tower for 11 years, and could have chosen the easier option if it followed the state's suggestion 11 years ago. Instead, it spent millions of dollars a year in legal fees trying to fight for a cheaper option that now appears to have amounted to nothing." But Entergy's resistance to the cooling towers is a standard play in the industry which, like most industries, tends not to volunteer to fund massive capital expenses. Most of the nuclear facilities currently operating in America don't have them, and few of the operators of the older plants would opt to build them because of the cost, N.R.C. spokesman Neil Sheehan said. After a protracted battle with state regulators over water discharge permits, the Oyster Creek nuclear plant in New Jersey agreed to shut down a decade early rather than construct the cooling towers. Oyster Creek's operators had made the economic calculation that they stood a chance of losing a protracted court battle over the permits. But in the end, the owner of Oyster Creek retired the facility voluntarily. It would be doubly unusual for a state to succeed in using water permits to shut down a plant outright for not agreeing to

Seeing Cuomo's hand, or not, in a state move on Indian Point

build a cooling-tower system. "We've not seen a situation where the state says we're not satisfied with the way the plant is operating and we're going to shut down," Sheehan said. A state official—in the only on-the-record comment so far on this matter since news broke of the D.E.C.'s plan—said emphatically that the shutdown proposal not part of a larger anti-Indian Point scheme. In an email, D.E.C. spokeswoman Emily DeSantis said, "The two are unrelated. DEC has taken the position that the outages are to protect one billion aquatic organisms in the interim until the issue of wedge wire v. cooling towers is decided. It's not a strong arm tactic. As we've noted previously, the issue of outages is not going to get settled any time soon, which give plenty of lead time to plan for it and make sure adequate capacity exists to serve customers." Whatever the motive behind the administration's proposal, it's unlikely that a state-enforced shutdown will happen anytime soon. Entergy would doubtless appeal any denial of state permits that impaired operations, as the company did when then-governor David Paterson's administration declined to issue the requisite water-quality certification. Now, as then, the N.R.C. would likely side with Entergy, allowing it to continue operating regardless of the state's efforts. There's also longer-term logistics to consider: The process of taking a nuclear plant offline, particularly one capable of meeting 25 percent of the energy needs of the nation's largest metropolitan area, is extensive and requires a series of steps to avoid rolling blackouts and skyrocketing bills. New transmission lines would be needed. Additional power sources would have to be brought online, and they produce air pollution, unlike nuclear energy. The process of replacing that level of capacity takes years. Cuomo has seen the political complexity of shuttering a power plant before. When Mario Cuomo was governor in the late 1980s, he used the state's licensing powers to help force the Shoreham nuclear plant on Long Island to close before it ever started operating. The elder Cuomo said at the time that stopping Shoreham was a matter of life or death because it was so close to densely populated New York City. Shoreham needed to have its evacuation routes approved by the state. So Mario Cuomo refused to grant that approval, and used that to force a deal that closed the plant. But the governor was unwilling to take sole responsibility for closing Shoreham. Even when a deal to close the plant was on table, Cuomo balked because he would have to make the decision alone. Instead, he insisted state Legislature vote on it. "The only thing I can see is that the reality and the responsibility are sobering," Paul Gioia, who served as chairman of the state Public Service Commission during much of the debate over Shoreham, told the New York Times in 1989. The governor, he said, "is clearly interested in sharing that responsibility." In the end, the Legislature declined to sign off and Cuomo went ahead alone. He successfully brokered the closure of Shoreham, the nation's first nuclear facility to be decommissioned, by making it financially appealing to the plant's operators. Shoreham's operators walked away with \$6 billion, which Long Islanders are still paying on today's utility bills, for a plant that never gave them power. Many of the same warnings Mario Cuomo heard in the 1980s about Shoreham are the same ones his son hears today from supporters of Indian Point: Closing a nuclear plant will result in blackouts, a less reliable electric grid and increased air pollution as fossil fuels are burned to replace the lost emissions-free nuclear power; customers could face higher bills; more than 1,000 jobs will be lost, and tax revenue for schools and towns will dissipate. Battles between nuclear operators and state regulators are common and typically last for years until a resolution is reached or a court decides the outcome, said David Repka, a former Nuclear Regulatory Commission attorney. But no other plant has ever been shuttered because it did not have the proper water permits, he said. "There's nothing common about this," Repka said. "Indian Point is clearly the focus of political pressure." Meanwhile, the state is actively preparing for a future without Indian Point. Hearings have been held on a contingency plan to replace the facility. The administration is pushing for new transmission lines that will help bring additional power to the area to replace some of what will be lost if Indian Point's 2,000 megawatts are taken offline. A damaged power plant in the lower Hudson Valley destined for the scrap heap was recently given state approvals to reopen. The state is also exploring how to increase the use of renewable energy to replace large power generators by placing smaller power sources, like solar, in more homes, businesses and communities. (Scott Waldman, AP News, Albany, July 31, 2014).

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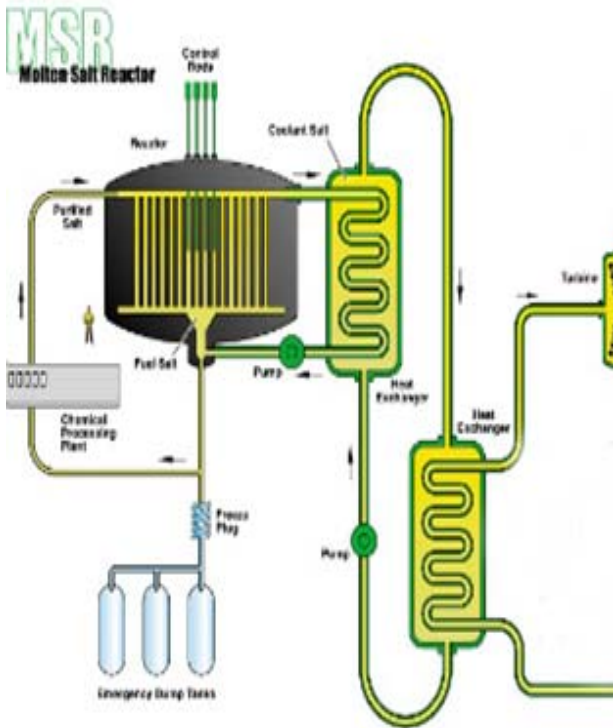
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Molten Salt Reactors enjoy 15 minutes of fame



On 6 June, UK researchers Jasper Tomlinson and Trevor Griffiths won £75,000 in Technology Strategy Board funding (including £20,000 of contributions-in-kind) to carry out an eight-month feasibility study.

The project, which will be managed by mechanical engineer Rory O'Sullivan, aims to develop a ranking of alternatives and configurations of a liquid-fuelled molten-salt reactor, including costs, regulatory, public acceptance and site issues for building and licensing a pilot-scale demonstration reactor in the UK. It would aim to prepare the ground for a full engineering design for the chosen option, to present to potential investors.

"There isn't an MSR currently operating anywhere. If people could look at one, their conception of nuclear power would entirely alter. They are nothing like the present PWR setup. They are so extraordinarily different. That is what we are trying to do," says Jasper Tomlinson, whose small business Energy Process Developments will be carrying out the work starting in September at the earliest, subject to signing a contract. The Alvin Weinberg Foundation is a London-based charity advocating for Gen IV reactors and thorium fuel, lists seven current international MSR projects: Ian Scott's Moltex project

in the UK, Elsa Merle-Lecotte's EVOL project in France, the US Transatomic Power project, David LeBlanc's Terrestrial Energy project in Canada, Kirk Sorensen's Flibe Energy project in the USA, Motoyasu Kinoshita's Fuji Reactor project in Japan, and Hongjie Xu's MSR Project in China.

On 19 May Atkins nuclear technical director, Paul Littler, and consultant Barry Snelson gave a lecture in Warrington entitled, 'Fission's future: Molten Salt Reactors - can they be the answer?'

In the talk, Littler said that there are some 18 different varieties of MSR. All use fuel in molten form; the salt consists of a chemical solution mixture of actinides, thorium, plutonium and uranium as halides. Temperatures are up to 800°C, so significantly hotter than LWRs, but because salts' boiling points are almost double that (1400°C) a pressurised primary system is not required.

According to the Weinberg foundation, MSRs have several benefits over current LWRs: molten fuel allows 30 times greater burnup than solid fuel, eliminates the risk of LOCAs since the coolant is also the fuel, and the molten salt fuel is not chemically reactive, so the fuel simply solidifies if it leaks out.

Littler of Atkins said that the reactor also allows the breeding of plutonium from fertile thorium, which is three times more abundant than uranium in the earth, and in terms of fuel-grade deposits is perhaps 100 times more abundant.

Littler said that MSRs could fill the gap between the end of the current generation of nuclear reactors and the development of commercial fusion power, and start up about 2050.

The lecture is available to watch online: <http://www.atkinsglobal.com/en-GB/media-centre/events/atkins-lectures/2014/molten-salt-reactors-can-they-be-the-answer>

(Nuclear Engineering International, June 11, 2014).



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