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**October 2018
Newsletter**



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*Come said the
LEAVES to the
wind one day,*

*Come o'er the
MEADOWS and
we will play.*

*Put on your
DRESSES of
Scarlet and
GOLD.*

*For SUMMER
is gone and the
days grow
COLD.*

George Eliot

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States and Communities Face the Cost of Nuclear Plant Closures



“Closure of our nation’s nuclear plants is dramatically affecting the cities and towns where these plants are located, as the revenues from these plants are going away, and this has brought about political pressure for state subsidies to help forestall the closures and prevent further shutdowns. However, the way things are going, by 2025, we could only have 89 operating nuclear power plants. – down from 104 - just a few years ago. The upcoming closures could affect California, Ohio, Iowa, Massachusetts, Michigan, and Pennsylvania.”

Many of the nation’s nuclear power plants are closing down, long before their operating license expires – this acceleration has been brought about by the high cost of refurbishment, upgrades like those required due to the Fukushima event, and the low price of natural gas.

These closures are dramatically affecting the cities and towns where these plants are located, as the revenues from these plants are going away, and it has brought about political pressure for state subsidies to help forestall further shutdowns.

Our 99 nuclear power plants, down from a peak of 112 in 1990, generate about 20% of the nation’s electricity, all of which is generated with zero carbon emissions – like the wind and solar renewables that everyone touts. However, these plants have a proven track record for reliability and an industry capacity factor of >95%. These plants have provided power even during severe weather conditions – remember the Alberta Clipper,

Nor’easter, and Cyclonic weather events, and most recently – during the summer heatwave these plants were the reliable source of power for our grid.

Six reactors have shut down in the past five years, and we have anywhere from 8 to 13 scheduled for closure by 2025 - in California, Ohio, Iowa, Massachusetts, Michigan, and Pennsylvania.

It appears that political sentiment is moving in favor of action to keep the nuclear plants operating in Pennsylvania, but Ohio seems to still be undecided, so FirstEnergy is steadily moving forward with plans to close their four plants – Davis Besse, Perry, and Beaver Valley 1&2.

The announcement to shutdown Indian Point, capped decades of controversy over its safety, and it was considered a victory for environmental groups and Governor Andrew Cuomo, who had long opposed the plant. However, the other plants in New York – Fitzpatrick, Ginna, and Nine Mile Point will continue to operate due to the passage of the Clean Energy Standard (CES).

The closure of Indian Point presents the local Hendrick-Hudson school district with a budget crisis. About one-third of the district’s annual \$79 million budget comes from the taxes paid by Indian Point. By 2024, three

years after the power plant is shutdown, the yearly payments will have dwindled from \$25 million to \$1.35 million.

Payments from Indian Point, which employs about a thousand people, also makes up more than 40% of the budget for the little village of Buchanan. “The biggest challenges are the loss of revenue, the loss of jobs, the cleanup, and the reuse of the 240 acres,” said Linda Puglisi, supervisor of the town of Cortlandt, of which Buchanan is a part.

To help communities affected by the Indian Point closure, New York state lawmakers this year pumped \$24 million into a 3-year-old “cessation mitigation fund,” originally designed to help upstate towns with shuttered coal plants. It now totals \$56 million.

Other states may pursue the same strategy. In California, where Diablo Canyon employs 1,500 people is scheduled to shut down in 2025. However, a bill on Governor Brown’s desk would allocate \$75 million to offset the lost property tax revenue in San Luis Obispo County, the reactor’s home; \$10 million for economic development and \$89 million for worker retraining.

No matter how you slice it ...THE COST of these CLOSURES is HIGH!

Heatwave Throws a “Curve Ball” to Green Energy Enthusiasts



“This summer’s heatwave has thrown green energy enthusiasts a “curve ball” as carbon emissions have increased, leading some experts to stress the need for a diverse energy mix; advocating more nuclear. Since the solar high-outputs coincided with the wind low-outputs, this collectively demonstrates the need for both technologies working together with the reliable foundation of nuclear while the migration to green energy continues.”

The heatwave, experienced this summer, has thrown green energy enthusiasts a “curve ball” as carbon emissions have increased, leading some experts to stress the need for a diverse energy mix; advocating more nuclear.

The weather may have been a boon for gardens, sun-bathers, and solar plant owners but the nation’s windfarms have suffered. They usually provide four times as much power as solar but the summer wind drought resulted in turbine blades sitting idle for days.

Yes, the heatwave did increase solar output and it helped to fill in some of the gap, but nuclear and coal-fired power plants provided the reliable foundation of supply while natural gas made up the difference, and at times worked with hydro to help meet peak demands.

Analysts have told renewable energy

investors not to be alarmed about the lack of wind this summer. After years of examination of monthly wind speeds, analysts do not find any evidence of a structural trend in wind speed over time. Since the solar high-outputs coincided with the wind low-outputs, this collectively demonstrates the need for both technologies working together with the reliable foundation of nuclear while the migration to green energy continues. Often wind and solar technologies are played against each other, but the reality is that a diverse portfolio ... which includes nuclear will be the solution to long-term variability.

Can batteries plug the gap when it’s not windy or sunny? Not yet. Utility-scale batteries are being installed in some areas of the country, but at present, they are being used for last-minute adjustments to

keep power supply and demand in balance, in order to regulate frequency at 60Hz. For the most part, economics and technology mean it does not yet make sense to store surplus green energy from one day to use on another, since the efficiencies of storing and then extracting this energy results in just a little over 50% of what was originally available for storage. In addition, the costs of these batteries, their maintenance, and disposal will also drive up electricity rates and that is something the customers do not want to hear.

Will climate change make wind droughts a regular occurrence? The jury is still out on this question. One study predicts that if the world warms by 1.5C above pre-industrial levels – and it almost certainly will, since temperatures have already climbed 1C – wind speeds would increase. Another study predicts the opposite.

How will a wind increase or decrease affect me – the utility customer? Either way, the increase in temperature will require more air-conditioning during the summer months and my electric bill will increase. Will the temperature increase, resulting in less need for electricity in the winter, offset the added cost in the summer? Not Likely and that is something the customers do not want to hear.

SCANA Shareholders, NRC, FERC, GA PSC Approve Dominion Merger



“NRC approved the indirect transfer of the Operating License for VC Summer to Dominion.”

Dominion announced this week that the NRC has approved the indirect transfer of the operating license for V.C. Summer Nuclear Station from SCANA subsidiary South Carolina Electric & Gas

Co. to the Virginia-based company.

The merger has already received approval from SCANA’s shareholders, the Federal Energy Regulatory Commission and the Georgia Public Service Commission. The merger remains contingent upon approvals from the public service commissions of South Carolina and North Carolina.

If the merger is completed, the combined company would deliver energy to approximately 6.5 million regulated customer accounts and have an electric

generating portfolio of about 31,400 megawatts and 93,600 miles of electric transmission and distribution lines. It also would have a natural gas pipeline network totaling 106,400 miles and operate one of the nation’s largest natural gas storage systems with 1 trillion cubic feet of capacity.



Nation’s Regulated-Utilities Focus on Power Grid Cyber-Security



“Over 36 electric regulated-utility companies have devoted almost half of their capital spending (~ 60 Billion) on grid improvements. That means a likelihood of rate increases for regulated-utility customers.”

Since the Department of Homeland Security recently detailed how Russian hackers had targeted the nation’s energy grid – saying that they could have caused major blackouts, but instead, appeared more focused on reconnaissance – the electric utilities are pouring billions of dollars into cyber-security protection to prevent terrorists or enemy governments from shutting down our power grid.

Over 36 electric regulated-utility companies have devoted almost half of their capital spending (~ 60 Billion) on grid improvements, according to the Edison Electric Institute, the trade

association for investor-owned utilities. Spending on new power plants fell to less than a third of that total, as electricity demand decreased to its lowest levels since 2009.

That means a likelihood of rate increases for regulated-utility customers. In the past, regulated-utilities based their business on building power plants and selling the electricity they generated - based on a regulator-approved profit margin to pay for it all. Now, the need for big generation projects has fallen after decades of energy conservation, fewer factories and the swapping of coal-fired power plants for cheaper and cleaner-burning natural-gas power plants.

Now these companies are shifting their business plans and are asking the regulators to approve customers paying to replace aging equipment, block malicious hackers, minimize outages, accommodate the upsurge of wind and solar power, and allow consumers more control over when and how much power they use.

Duke-Energy CEO Lynn Good told Wall Street analysts, "This infrastructure will provide significant benefits to our customers, including improved customer control and convenience, and cyber and physical security enhancements while creating thousands of jobs and supporting the state's economy."

CA & NJ See a Different Approach to 100% Carbon-Free Electricity



“California lawmakers just passed legislation requiring the state to generate 100% of its electricity from carbon-free sources by 2045. By the end of 2026 they require 50% but how can this be accomplished without Diablo Canyon – 2,200 MWe of carbon-free electricity – currently schedule for closure by 2025. The cost of electricity in California is already 60% higher than the rest of the U.S - average customer in Southern California pays 27¢ / Kw-hr in the summer and 23¢ / Kw-hr in the winter. Passage of this legislation will drive cost even more.”

In California, state lawmakers passed legislation requiring the state to generate 100% of its electricity from carbon-free sources by 2045; 33% by the end of 2020 and 50% by the end of 2026, before relying entirely on renewable sources in 2045.

Without nuclear, which would mean without Diablo Canyon (> 2,200 MWe) - currently scheduled for shutdown in 2024 (Unit 1) and 2025 (Unit 2), they might want to remember what happened during this past July 4th weekend in Southern California, when temperatures soared to 110°F, and ALL the lights went out for tens of thousands. Californians were powerless, without air conditioning, in the hottest weather many had ever experienced. And still on Monday, July 9th, over 34,500 residences and businesses in the Los Angeles area were still without power.

Electric costs in California are already 60% higher than those in the rest of

the U.S., and this new legislation will add to those costs. The average customer is Southern California pay 27¢ / Kw-hr in the summer and 23¢ / Kw-hr in the winter. If usage exceeds 130% of the baseline, the price goes up to 48¢ / Kw-hr in the summer and 40¢ / Kw-hr in the winter. According to a report from The Los Angeles Times, California is using less power than it did in 2008 but it is paying \$6.8 billion more for it. Only Alaska and Hawaii have higher average electricity costs, according to the U.S. Energy Information Administration.

When you look at the math, closure of California’s two remaining nuclear plants will be costly, but realistically without them they have no other reliable 24/7 source of power that can provide carbon free electricity, so how will they achieve these requirements?

New Jersey is taking a more thoughtful approach - they also want 100% carbon-free electricity – but by 2050. They realize that for the short term, nuclear and natural gas will be needed for the transition to a 100% renewable-energy future.

In 2017, nuclear and natural gas provided more than 90% of New Jersey’s electricity, Governor Phil Murphy signed a law that could put ratepayers on the hook to provide up to \$300 million a year over the next decade to prop

up nuclear power. Under that law, 40% of the state’s electricity would come from nuclear.

Nuclear advocates argue that nuclear is also needed for the long-term until battery technology can meet the storage needs to allow solar and wind to support the power needs when solar and wind are not available.

Natural-gas is also a part of the mix for the short-term and its use is expected to increase, as multiple new pipelines are being planned and expected to be built.

Currently, 75% of homes in New Jersey are heated by natural gas and with these new pipelines - approvals are being sought for three new natural-gas plants — one in the Highlands, one in Hudson County, and one in Cape May.

Natural-gas prices are expected to stay low, which New Jersey believes will help with the transition to a low-carbon future.

While most conversation, discussion, and argument are being focused on nuclear and natural gas - others argue that New Jersey needs to make sure solar continues to grow. They want to see the benefits of solar and energy efficiency extended to low- and moderate-income communities, which have been largely left out of the solar boom to date.

Did You Know?



“

<p>Do you pay 27¢ / Kw-hr summer 23¢ / Kw-hr winter?</p>	<p>That the average customer in Southern California pays 27¢ / Kw-hr in the summer and 23¢ / Kw-hr in the winter? How much are you paying for electricity? In South Carolina, the average Duke-Energy customer pays 11.6¢ / Kw-hr winter or summer.</p>
<p>placement of the third of four steam generators at Vogtle</p>	<p>That another construction milestone has been accomplished at Georgia Power’s Vogtle Nuclear Expansion Project - placement of the third of four steam generators, this one installed at Unit 4. Recently Georgia Power announced that the Vogtle Nuclear Expansion Project was ~67% completed.</p>
<p>Environmental Protection Agency (EPA) announced a new plan, the Affordable Clean Energy (ACE) Rule</p>	<p>That in late August 2018, the Environmental Protection Agency (EPA) announced plans to significantly alter the Clean Power Plan (CPP)? The new plan, the Affordable Clean Energy (ACE) Rule, removes the nation-wide target for reducing carbon emissions and gives states more authority to set their own rules for coal-fired power plants, encouraging them to run more efficiently. The rule offers guidelines for states to use when developing their own plans. “The ACE Rule would restore the rule of law and empower states to reduce greenhouse gas emissions and provide modern, reliable, and affordable energy for all Americans,” said EPA Acting Administrator Andrew Wheeler.</p>
<p>1 MWe hydro facility, Valatie Falls, to be operational 4th quarter of 2018</p>	<p>That a 1 MWe hydro facility, Valatie Falls – also known as Beaver Kill Falls, built in 1983 and located in New York State is being repowered specifically to serve as a fully-dedicated source of power for a new co-located cryptocurrency mining farm, scheduled to be fully operational in the 4th quarter of 2018.</p>
<p>FirstEnergy Solutions to shut down its four-remaining coal plants by 2022; this will leave ~24 coal-fired plants operational in Ohio and Pennsylvania</p>	<p>That FirstEnergy Solutions plans to shut down its four-remaining coal-fired plants by 2022? Three of the four plants are in Stratton, OH, the fourth plant in Shippingport, PA. "Our decision to retire the fossil-fueled plants was every bit as difficult as the one we made five months ago to deactivate our nuclear assets," said Donald Moul, FES Generation Companies president and chief nuclear officer, in a statement. He went on to say that coal and nuclear power plants are losing out to cheaper energy sources such as natural gas and renewables. Closure of these plants will leave ~24 coal-fired plants still operational in OH and PA.</p>
<p>Xcel Energy is gradually transitioning unmanned aircraft drones into their T&D operations</p>	<p>That Xcel Energy is gradually transitioning unmanned aircraft drones into their T&D operations? Using advanced command-and-control technology, licensed pilots are remotely operating a small, 35-pound drone, equipped with two cameras, to collect data on the condition of power lines and transmission towers. According to Ben Fowke, chairman, president and CEO, Xcel Energy, “This innovative technology is revolutionizing our work by improving the safety, efficiency and cost effectiveness of maintaining and protecting the grid for our customers.”</p>



Will the Rocky Flats National Wildlife Refuge – Near Denver - Open?



“The “Cold War Horse” pictured above is a memorial created in honor of those who worked at the Rocky Flats nuclear weapons production plant from 1951 to 1989. After cleanup, decontamination, demolition of over 800 structures at the plant site, and decades of inactivity the USFWS is ready to open the nation’s newest wildlife refuge – Rocky Flats National Wildlife Refuge – home to more than 630 plant species and 230 animals, including the threatened Preble’s meadow jumping mouse and a 100-strong herd of elk. But, local government and health officials are leery because plutonium still remains in the ground where the facility once stood, and they are fighting its OPENING!”

Rocky Flats National Wildlife Refuge, outside Denver, Colorado in Johnson County, slated to open this fall, is facing public scrutiny and may not OPEN.

Why? A top local health official says he would probably never hike there, and a town, nearby, is suing over plutonium soil contamination, and seven of Denver’s metro school districts have barred school-sanctioned field trips to the refuge.

The 5,237-acre wildlife refuge sits on land that surrounds the Rocky Flats nuclear weapons production facility. From 1951 to 1989, they manufactured plutonium triggers - grapefruit-sized spheres - that catalyze a nuclear reaction when they are compressed by explosives.

Government officials say the plant site has been cleaned up, declared safe, with no need for further remediation. In addition, the 1,300-acre patch within the wildlife refuge is fenced off and controlled by the DOE. But, local government and health officials are leery of these claims because plutonium still remains in the ground where the facility once stood.

In 1989 the plant was raided by the FBI and the EPA over environmental crime concerns, such as dumping toxic waste into the drinking water. As a result, it was added to the EPA’s Superfund National

Priorities List for cleanup and decontamination.

Originally, the DOE estimated cleanup would take 60 yrs and cost more than \$30 billion. But the cleanup, carried out by an independent contractor, only took 10 yrs at a cost of \$7 billion - requiring decontamination and demolition of more than 800 structures. And upon completion, the DOE announced that zero remediation was needed.

The Johnson County Public Health Department Executive Director, Mark Johnson, has his own doubts about the park’s safety. “If I honestly felt that the data showed the risks of hiking out there were very, very little, I wouldn’t fight them opening it,” said Mark Johnson. “I think it’s too convenient that the original [cleanup] estimate of 70 years and billions of dollars was cut so short and so cheap.”

Residents of Superior, a nearby town of 13,000 at the refuge’s north-eastern edge, are worried that hikers and bikers could track plutonium-laced dirt out from the refuge and are suing over it.

According to Timothy Gablehouse, the attorney representing Superior, “All of the risk assessment regarding plutonium was based on a very limited hiking utilization and work on the refuge by refuge employees, so we’re talking about stuff that was not going to generate

much in the way of dust, was not going to disturb a lot of soil or subsurface. That has changed”.

DOE and USFWS (U.S. Fish & Wildlife Service) said visitors to the refuge will not be able to access the demolished plant site because the area is fenced off and controlled by the DOE. And the land outside the fence, surrounding the demolished plant, has remained largely untouched over the past half-century. This minimal foot traffic has allowed flora and fauna to thrive - home to more than 630 plant species and 230 animals, including the threatened Preble’s meadow jumping mouse and a 100-strong herd of elk. “The habitat and wildlife of this area are unique to the whole front range,” said Cynthia Souders, a USFWS supervisory ranger.

Rocky Flats National Wildlife Refuge Manager, David Lucas said, “We rely on the science and the agencies that are responsible, and we believe it’s safe for the public and all of our visitors.”

Colorado environmental specialist, Lindsay Masters, said, “This is one of the most well-studied pieces of land on the planet. It was cleaned up in accordance with state and federal law and regulations. The risk [to visitors] is incredibly low.”



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We're on the Web!

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GTTSi at the 2018 SSNTA Meeting in Chattanooga, TN



SSNTA members met in Chattanooga, TN at a TVA facility downtown. Representatives from Southern Company, TVA, Duke-Energy, SCANA, Dominion, NRC, INPO, and GTTSi attended.

Common training issues were discussed, and the approach used at the various sites was shared by all – providing valuable insight that those attending can take back to their plants.

Pictured above is a Duke Energy representative talking with a TVA representative and below is everyone getting a chance to see and use the “Virtual Reality” device and software being incorporated into some of TVA’s training.

We discussed NUREG 1021 – its latest revision and impact on Operator Training, the importance of the site input on the 3-yr NRC Exam Schedule sent out each year, the impact of only two GFES Exams per year, self-critique during review of training, PUA (procedure use and adherence), 7.1.111, increase in operating exam failures, latest update on the revision to the K/A Catalogue, and the Exam Writers Conference in 2019.



FAQ’s were reviewed, and Ken Schaaf demonstrated how to register a question for review with the NRC on their webpage and shared some recent answers to questions; one of which, he had personally submitted during his NRC Exam development for other utilities.

Several members reviewed their answers to our “benchmark” questions – revealing some commonality that we all face within Operator Training – providing insight and different approaches.

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