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## January 2019 Newsletter



### Individual Highlights:

- AP1000 Global Fleet – 4 Units Operating & 2 Units Under Construction pg#2
- U.S. Coal & Nuclear Plants NEEDED ... Now MORE Than Ever! pg#3
- McNamee Fills the Federal Energy Regulatory Commission Vacancy pg#4
- Greenville County Power Station Joins Dominion's Natural Gas Fleet pg#4
- Atlantic Coast Pipeline Targets Completion for the End of 2019 pg#5
- Do You Remember When - 2018? pg#6
- Is Grid Resilience "on docket" with New FERC Chairman Chatterjee? pg#7
- 35+ Year Award – Sid Crouch pg#8

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*Although no one can go back and make a new START,  
anyone can start from NOW and make a new ENDING!*

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## AP1000 Global Fleet - 4 Units Operating & 2 Units Under Construction



**“China has four AP1000 Units - three are commercial - Sanmen 1 & 2, and Haiyang 1. The fourth, Haiyang 2, is connected to the grid and plans commercial operation in 2019. The U.S. has two AP1000 Units under construction - Vogtle 3 & 4, located near Waynesboro, Georgia. Georgia Power recently announced placement of the 3<sup>rd</sup> and final vessel ring, and placement of the 4<sup>th</sup> and final reactor coolant pump (RCP) for Unit 3. Vogtle 3 is expected online in November 2021 and Vogtle 4 in November 2022.”**

China has four AP1000 Units - three are commercial - Sanmen 1 & 2 and Haiyang 1. The fourth, Haiyang 2, is connected to the grid and plans commercial operation in 2019.

Sanmen 1, was the first unit to start construction (**April 19, 2009**), the first to reach initial criticality (**June 21, 2018**), the first to connect to the grid (**July 2, 2018**), the first to reach 100% power (**August 14, 2018**) and the first to reach commercial operation (**September 21, 2018**).

Haiyang 1 reached commercial operation in October 2018. Sanmen 2 achieved initial criticality the same day Haiyang 1 connected to the grid (**August 17, 2018**) and just seven days later Sanmen 2 connected to the grid (**August 24, 2018**), and achieved commercial operation on November 5, 2018.

China now has 45 nuclear reactors in operation with

12 new units under construction.

These four units are the Westinghouse AP1000 design. The AP1000 is a Generation III+ two-loop pressurized water reactor (PWR), that features a passive safety design, harnessing the laws of nature including gravity and convection to support safe and efficient plant performance. In addition, the plant is designed to safely and automatically shutdown without operator action for up to 72 hours in the event of a design-basis incident.

Six units, currently, makeup the Westinghouse AP1000 Global Fleet; Sanmen 1 & 2, Haiyang 1&2, and Vogtle 3 & 4. Two other units were planned but construction for V.C. Summer 2 & 3 was abandoned on July 30, 2017.

The U.S. has two AP1000 Units under construction - Vogtle 3&4 (**pictured below**) - located at the Alvin W. Vogtle Electric Generating Plant near

Waynesboro, Georgia.

Georgia Power recently announced placement of the third and final containment vessel ring, and placement of the fourth and final reactor coolant pump (RCP) for Unit 3.

"These milestones further demonstrate the significant progress we continue to make at the construction site as we remain focused on the safe, quality construction of these new units," said Vogtle 3 & 4 Construction Senior Vice President Glen Chick.

Vogtle 3 & 4 will be the nation's first new nuclear units to be built in 30 years and are co-owned by Georgia Power, Oglethorpe Power, MEAG Power and Dalton Utilities. Unit 3 is expected online in November 2021 and Unit 4 in November 2022. Once they are operational, they will generate enough emission-free (**zero carbon emissions**) electricity to power approximately 500,000 homes and businesses.



## U.S. Coal & Nuclear Plants NEEDED ..... Now MORE than Ever!



**“The U.S. is facing a reduction in natural-gas stockpiles – at unusually low levels. Since, many of the nation’s coal and nuclear plants, that saved the day last year, are no longer operating - we could be headed for a worst-case scenario where the United States lacks sufficient power generation to meet the electrical demand. Since 2011, more than 46.5 gigawatts of coal-fired generation have been shutdown, and another 19 gigawatts of coal capacity is slated for shutdown over the next decade. Since 2012, six nuclear-power plant units have been retired and 14 more are scheduled for closure by 2025.”**

Although the United States has been the world’s top producer of natural gas since 2009, we are facing reductions in natural gas stockpiles – approaching unusually low levels.

Do you remember last year’s deep freeze? The PJM Interconnection, which oversees electricity supplies for 13 states and the District of Columbia, published their review of the January 2018 deep freeze - it raises questions about our natural-gas capacity.

In 2018, natural-gas capacity was unavailable due to “supply outages” – more than 8,000 MW’s of natural gas capacity forced to shutdown. But, according to the Department of Energy (DOE) our coal-fired and nuclear power plants came to the rescue. The DOE says that, without the sturdy baseload power generation produced by them, “the Eastern United States would have suffered severe electricity shortages, likely leading to widespread blackouts.”

The winter of 2018 left other troubles in its wake,

and with the late arrival of spring - gas producers had less time to recover the nation’s natural gas storage capacity. And, this year, as the utilities have been tried to catch-up on storage, the recent Thanksgiving cold snap siphoned down those stockpiles – resulting in natural gas storage at unusually low levels.

You may have noticed this based on the rising cost of natural gas - it has soared since mid-November to the highest levels in over four years – rising from ~\$3 to almost \$5, most recently.

The potential for a real natural gas shortage isn’t hypothetical - Forbes analysts warn of “historically low gas storage” in 2019, and the Energy Information Administration (EIA) said storage of natural gas is 16% lower than its five-year average.

With the stockpiles of natural gas dwindling and natural gas pipelines almost ready to deliver gas to the coast for liquification – natural gas producers are focused on shipping more natural gas overseas – i.e., Asia and Europe. In fact, natural-gas exports are expected to triple by the end of 2019.

You might think, OK .... this might affect natural gas prices, but electricity supply will be unaffected. If this is what you are thinking ... you could be wrong and freezing in the dark! Many of the coal and nuclear plants that saved

the day last year are no longer operating.

NERC (North American Electric Reliability Corporation) said more than 46.5 gigawatts of coal-fired generation have been shutdown since 2011, and another 19 gigawatts is slated for shutdown over the next decade. Since 2012, six nuclear-power plant units have been retired with 14 more scheduled for closure by 2025.

We could be headed for a worst-case scenario where the United States, experiences a cold snap or deep freeze, like in years past, and lacks sufficient power generation to meet the electrical demand.

The rapid dismantlement of the nation’s coal and nuclear plants, and our inability to add new natural-gas pipelines could result in real problems —at a time when Americans need electrical reliability.

The obvious answer is to maintain baseload power from all sources — including coal, nuclear, natural gas, and renewables. It would be wise, then, not to hastily eliminate the coal and nuclear plants that — as the 2018 winter demonstrated — continue to carry America’s peak power needs on their backs.



## McNamee Fills the Federal Energy Regulatory Commission Vacancy



***“Bernard McNamee was approved to fill a vacancy at the Federal Energy Regulatory Commission (FERC). He will complete the remainder of a 5-year term.”***

President Donald Trump nominated Bernard McNamee to fill a vacancy at the Federal Energy Regulatory Commission (FERC). At the time he was nominated he was serving as the director of the policy officer at the Department of Energy (DOE).

The Senate approved Bernard McNamee's

nomination with a 50-49 party-line vote. McNamee will complete the remainder of a 5-year term slated to end on June 30, 2020.

At the DOE, McNamee served as deputy general counsel for energy policy, as well as practicing energy law at McGuire Woods LLP in Richmond, Virginia.

Before his time at the DOE, McNamee headed up the Tenth Amendment center at the Texas Public Policy Foundation, a conservative think tank, and he was legal counsel to former Virginia Governor George Allen from 1995 to 1998.

Most recently, he was instrumental in designing Energy Secretary Rick Perry's plan for a Notice of Proposed Rulemaking (NOPR) which would have provided cost recovery to plants able to provide 90 days of onsite fuel – specifically coal and nuclear plant. The NOPR was originally proposed in October 2017 but rejected by FERC in January 2018.

Perhaps now, Commissioner McNamee will be able to gather support within FERC working from the inside rather than the outside.

## Greenville County Power Station Joins Dominion's Natural Gas Fleet



***“Greenville County Power Station online with capability of 1,588 MWe – enough power to light, heat, and cool nearly 400,000 homes.”***

Greenville County Power Station located just a few miles west of Emporia, VA – just across the North Carolina line off I-95 – just joined Dominion Energy's fleet of natural gas-fueled electric generating plants.

This \$1.3 billion project (*pictured above*) has three combustion turbine

units, designed to produce 1,588 MWe - enough power to light, heat, and cool nearly 400,000 homes.

Construction at Greenville County began in June of 2016 and it was completed on schedule and on budget.

This was Dominion's second major investment in Southside area - in 2016, the \$1.1 billion, 1,360-MW Brunswick County Power Station was put into service, just a few miles away.

Both stations, Greenville County and Brunswick County, already have natural gas service, but when the Atlantic Coast Pipeline is completed,

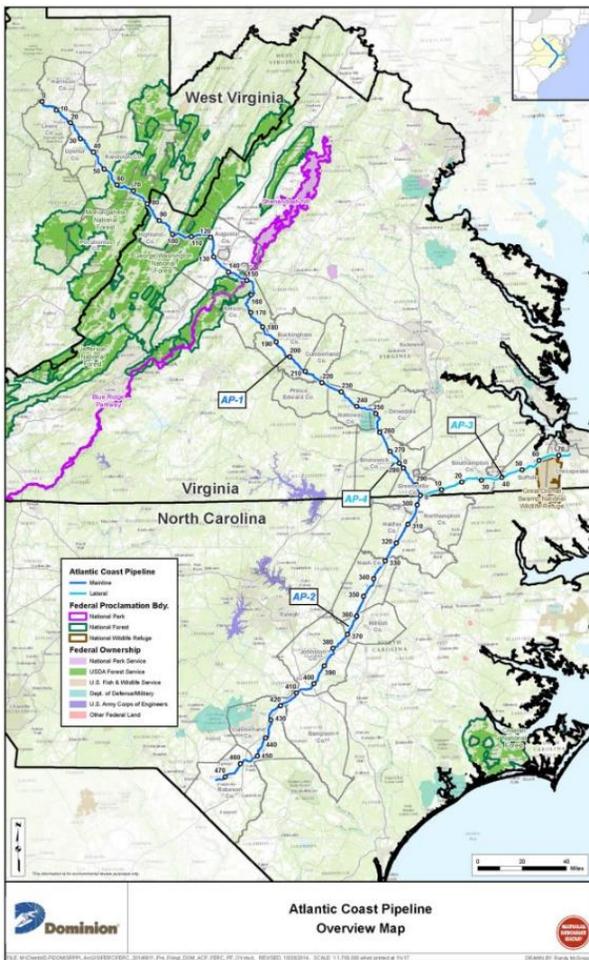
they will be connected to that natural gas source, as well – adding to their ability to provide reliable service and reduce customers' costs.

Greenville County Power Station is expected to provide up to \$7 million in property taxes - its first year of operation.

Post-construction it is projected to provide ~\$36 million annually. The station will have 49 full-time employees.

Over its expected lifetime, Greenville County Power Station will save Dominion Energy customers ~\$2.1 billion as a result of not having to purchase power from other sources.

# Atlantic Coast Pipeline Targets Completion for the End of 2019



***“The Atlantic Coast Pipeline (ACP) is a 600-mile natural gas pipeline that will run from West Virginia, through Virginia, to its destination in North Carolina. Recently, during the Dominion SCANA Merger talks – a Dominion executive said the project could expand into South Carolina.”***

The Atlantic Coast Pipeline (ACP) is finally moving forward and is targeting completion by the end of 2019. In September, the Federal Energy Regulatory Commission (FERC) re-issued authorization, after response to a court challenge, and in October the Commonwealth of Virginia authorized construction.

This 600-mile natural gas pipeline will run from West Virginia, through Virginia, to its destination in North Carolina but during the recent Dominion SCANA Merger talks – a Dominion executive said the project

could expand into South Carolina

17,000 construction jobs, and 2,200 new jobs at the pipeline’s four transmission hubs are anticipated and the U.S. Chamber of Commerce estimates the construction phase will generate \$2.7 billion in total economic activity with \$4.2 million in average annual local tax revenue. When construction is completed, the 2,200 new jobs will generate \$65.1 million total economic activity with \$28 million in average annual local tax revenue.

The Atlantic Coast Pipeline and other natural gas pipelines - throughout the country - fit perfectly into the country’s energy dominance national security policy. However, not everyone agrees, in Massachusetts - state and local government officials blocked the pipeline that would bring in natural gas reserves from Pennsylvania - so natural gas had to be purchased from Russia and shipped to Boston to meet the eastern region’s energy needs, just last winter.

The nation’s four-pronged strategy of tax reform, regulatory reform, trade reform, and energy reform all come together with implementation of the ACP. Tax reform encouraged the pipeline builders to make the investment, regulatory reform cleared the pathway for obtaining the scrutinized federal permits and trade reform will boost exports of our energy resources, which in turn, will expand our energy exports, reducing trade deficits - keeping jobs and cash in the U.S. - instead of going to other countries.

Permanent energy self-sufficiency - once a pipe dream for American’s who remember waiting for hours in gas lines back in the 70’s - is now very close to reality.

Many see natural gas as a necessary but temporary step to ONLY renewable energy sources, but solar and wind still rely on unreliable variables, and are therefore, decades away from being considered a reliable energy source.



## Do You Remember When - 2018?



**“During the confirmation hearings for Rick Perry (DOE Secretary), that questions arose about Yucca Mountain because of pressure building over concerns that 84,250 tons of spent fuel assemblies are currently being stored at nuclear facilities across the country. Perry said he supported interim storage of nuclear waste in Texas and any other states willing to store the waste from nuclear power plants.”**



<p><b>SC at a crossroads with Solar Power</b></p>	<p>We disclosed how <b>SC was at a crossroads concerning expansion of Solar Power?</b> The reason you may remember was due to Solar Power’s success in SC, as both SCE&amp;G and Duke Energy expected to reach the state-mandated limit of the South Carolina Energy Plan – Act 236 by the end of 2019. <b>(February Article page 2)</b></p>
<p><b>Upcoming rule changes expected from the NRC in 2019 for Decommissioning Streamlining</b></p>	<p>We discussed the <b>upcoming rule changes expected in 2019 for Decommissioning Streamlining?</b> You may remember they <b>(NRC) were striving to cut down on the large number of exemptions and amendments that the owners of decommissioning reactors are seeking.</b> However, in the Senate the Safe and Secure Decommissioning Act was being sponsored that would prohibit the NRC from issuing waivers or granting exemptions from compliance and with safety and emergency preparedness regulations laid out in the Atomic Energy Act of 1954, until spent fuel from the reactor has been transferred into dry fuel casks. <b>(March Article page 4)</b></p>
<p><b>Natural Gas and Solar are driving up costs for Duke Energy customers in NC</b></p>	<p>We reported how <b>Natural Gas and Solar were driving up costs for Duke Energy customers in NC?</b> This was due to what is called “avoided costs”. The Public Service Commission resets these costs every two years and since Duke Energy has long-term contracts with developers of natural gas generation (<b>paying \$55 - \$85 per MW-hr</b>) and the low price of natural gas results in a net loss - about \$80 million per year or ~\$1 billion over the life of the contracts. With solar it was similar story - about \$1 billion loss over the next 12 years. <b>(April Article page 4)</b></p>
<p><b>Cost to replace U.S. Electric Grid - \$5 Trillion</b></p>	<p>We asked if you were ready for <b>the cost of replacing our U.S. Electric Grid - \$5 Trillion?</b> Back in 2005, the DOE said we needed ~1000 <b>power plants</b> built over the next two decades but that <b>only accounts for ~56% of the total cost, the other is ~9% transmission, and ~35% distribution.</b> <b>(May Article page 3)</b></p>
<p><b>CA &amp; NJ take different approaches to achieving 100% carbon-free electricity</b></p>	<p>We showed how <b>CA and NJ were taking different approaches to achieving 100% carbon-free electricity?</b> In <b>California they plan to do it without nuclear (Diablo Canyon) and by 2045 with only renewables</b> - without batteries to backup the wind, solar, and geothermal it cannot be too reliable and with the current battery technology it will be very costly. Californian’s already pay 60% more than the rest of the country, so how much more will it be by 2045. While in <b>NJ, they plan to use a combination of natural gas and nuclear.</b> Over the next ten years as renewables are increased and natural gas diminished, nuclear is still expected to supply 40% of NJ’s electricity needs. <b>They believe nuclear will continue to be needed until the battery technology can meet the storage needs required to make solar and wind reliable.</b> <b>(October Article page 5)</b></p>

# Is Grid Resilience “on docket” with New FERC Chairman Chatterjee?



**“Recent changes at FERC – the appointment of Neil Chatterjee as Chairman and the addition of Bernard McNamee, as a commissioner, might make a difference on Grid Resilience. Just one day before the swear-in for McNamee, Richard Glick, a FERC Commissioner, predicted a return to the debate over compensation for coal and nuclear generation at FERC. But in mid-December, seventeen senators sent a letter to McNamee, requesting his recusal from “any future matters before FERC that might be characterized as pitting one fuel source against another.””**

In January 2018, the Federal Energy Regulatory Commission (FERC) unanimously rejected a proposal submitted by the DOE, through a NOPR (**Notice of Proposed Rulemaking**) to provide cost recovery to plants with an onsite 90-day supply of fuel, which resulted in a longer term proceeding on grid resilience.

In June, the White House responded with a directive to the DOE ..... **find another way to save the plants**, but that plan is reportedly on hold within the administration.



In October, President Donald Trump designated Commission Neil Chatterjee (**pictured above**) as the FERC chairman - stepping in for Kevin McIntyre, who had to resign due to a serious health setback that left him unable to continue.

Although the commission ruled unanimously, in January, that the DOE hadn't provided enough evidence in the NOPR submittal that the proposed measures were needed, Chatterjee

indicated he would support some kind of intervention in principle.



In December, Bernard McNamee (**pictured above**) was approved by Congress to fill FERC's vacant seat. He was instrumental in designing the plan (**Notice of Proposed Rulemaking**) that was proposed by the DOE and then rejected by FERC in January 2018.



Just one day before the swear-in for McNamee, Richard Glick (**pictured above**) predicted a return to the debate over compensation for coal and nuclear generation at FERC. Since, the supposed emergency bailout seems to be on hold at the White House, "a lot of the focus is returning to FERC" on grid resilience issues, Glick said.

However, he went on to add .... that Chairman Neil Chatterjee will determine the direction FERC will take on resilience, and he is "not entirely sure where the chairman wants to go with that proceeding yet."

The new FERC leader was previously an energy adviser to Senate Majority Leader Mitch McConnell, and it appears that he is on track to resolve this issue one way or the other.



Kevin McIntyre (**pictured above**), the departing chairman, held the traditional view that there shouldn't be subsidies for coal and nuclear plants even if they are struggling to break even, but with Chatterjee taking the helm, the matter appears to be moving in another direction.

Mid-December, seventeen senators sent a letter to McNamee, signed by Senate Minority Leader Chuck Schumer, N.Y., as well as every other Democrat member of the Energy and Commerce Committee, except Sen. Joe Manchin, requesting his recusal from "any future matters before FERC that might be characterized as pitting one fuel source against another." They made this request based on his previous positions in supporting the NOPR and a speech he made in February 2018.



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## GTTSi 35 Year Award - Sid Crouch



*"It is hard to believe it has been 35+ years with GTTSi - a remarkable company with a deep-seated goal of providing quality service to our clients – the first time, every time. And when you couple that kind of service, with professional, conscientious, loyal employees, and a caring-rewarding leadership – it is almost heaven and you look forward to coming to work."*

During these 35 years, Sid spent 18 years on the road – his family accompanying him - enduring the various hardships and rewards that accompany each new adventure. He says, "the support of his wife, Kay, and his family made all the difference and without their support he could never have accomplished it".

His career at GTTSi began January 1981, in New Jersey at Salem Nuclear Station. He put together their Requalification Training Program in accordance with NUREG 0737, 10CFR50, and the newly adopted INPO Standards, while teaching reactor theory, heat transfer, fluid flow, core mitigation strategies, accident analysis, and plant systems. Once their Requalification Training Program was accepted and approved by the NRC and turned over to PSE&G - he moved on to New Hampshire at Seabrook Nuclear Station. There, he was an instructor for their "first" Initial License Operator Class; this class was a first for the industry - all Engineers. After Seabrook – on to California to help with RESTART at Rancho Seco (**SMUD – Sacramento Municipality Utility District**). Following Rancho Seco, he went to Texas at Comanche Peak Nuclear Station. Here he worked as an instructor with their "first" Initial License Class, and eventually with six more ILT (**Initial License Training**) classes. Later he was asked to move into the Operations Group – working directly with the Operations Manager - to Startup Comanche Peak Unit 2. After Comanche Peak, he was off to South Carolina at H.B. Robinson working as an instructor with their Engineering Training Program; later on, he became their Initial License Training Manager and then their Licensed Operator Requalification Training Manager. After H.B. Robinson, he went to North Carolina at McGuire Nuclear Station - re-writing the Operator Training Materials. Sid became GTTSi Operations Director in 2007 and moved up to Vice-President, Technical Operations in 2012.

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