Energy Policy Council

NORTH CAROLINA ENERGY POLICY COUNCIL
MEETING MINUTES
10:00 a.m., May 15, 2019
Archdale Building
Ground Floor Hearing Room
512 N. Salisbury Street, Raleigh, NC 27604

Energy Policy Council Members Present:
Steven Walker
Sushma Masemore
Rachel Estes
Herb Eckerlin
Gus Simmons
Bruce Barkley
Rick Feathers
John Hardin
Paul Worley

CALL TO ORDER

Mr. Steven Walker called the Energy Policy Council (EPC) meeting to order at 10:00 a.m. on Wednesday, February 20, 2019. After welcoming the Council members, staff and the public to the meeting, Mr. Walker began with the first presentation which gave an overview and update on the nuclear industry because not enough members were present to make a quorum and approve the meeting minutes from the EPC meeting held on February 20, 2019. After the first presentation concluded, there were enough members present to vote on approval of the previous EPC Meeting minutes. Mr. Bruce Barkley made a motion to approve the meeting minutes, Mr. John Hardin seconded the motion for approval and the minutes were approved by the Council. Mr. Walker then allowed the presentations to continue with an update on nuclear generation at Duke Energy.

PRESENTATIONS

Overview and Update on the U.S. Nuclear Industry
Mr. Bradley Williams, Senior Advisor, Office of Nuclear Energy, U.S. Department of Energy (DOE)

Mr. Bradley Williams started his presentation discussing the importance of nuclear power on energy security in the Unites States, national security, economic prosperity, and environmental sustainability. He said it represents 20% of our national electric generation, maintains a 92% capacity factor, supports 475,000 jobs, and annually raises $10B in federal and $2.2 in state taxes. Mr. Williams stated that its international impact included 450 operating nuclear power plants (NPPs) that supply 11% of the electricity, and that 60 reactors are now under construction in 15 countries (20 of which are in China). Since 2013, the premature shut down of 7 U.S. NPPs have removed 5,276 megawatts (MW) from the electric grid and 12 more, representing 11,220 MW, are likely to shut down by 2025. State policy actions in 2017-18 averted the shutdown of 7 more NPPs that generate 6,255 MW. The U.S. DOE has docketed 18 Combined Construction and Operating Licenses (COLs) since 2007. Of the 18 COLs, 8 (totaling 14 reactors) have been approved, 10 (totaling 14 reactors) were suspended and or withdrawn, and 6 licensees currently hold COLs.

Mr. Williams reviewed next generation nuclear reactors across the U.S. that include small modular, molten salt, fluoride salt-cooled high temperature, nuclear battery, pebble bed, and other innovative designs. He reported Congress's strong and bipartisan support to sustain the current nuclear fleet, support advanced reactor concepts and innovation, and fund $1.3B in 2019 for DOE's support of nuclear efforts. He concluded that nuclear energy's clean, reliable, and resilient baseload generation will continue to guide many countries toward it to support their energy security, national economy, and environmental goals. Opportunities for new nuclear growth has strong global market interest for increased access to electricity. U.S. leadership strives to ensure its safety and nonproliferation, and is committed to advancing nuclear energy here and abroad.

During the presentation, Mr. Walker asked if nuclear plants in general were being replaced with natural gas. Mr. Williams answered that yes they are and that roughly two-thirds to three-quarter nuclear power plants are going to natural gas. Mr. Walker asked if the push to move from nuclear to natural gas was based on the environment or the cost. Mr. Williams shared that most nuclear power plants are shutting down because of money and economics. Natural gas is cheaper and there is an abundance. Mr. Walker then asked if small modular reactors and micro-reactors have start-up costs and if so, how much cheaper is it to get the same amount of energy. Mr. Williams answered that it is cheaper per kilowatt to build a small modular reactor; however, on a per kilowatt basis, the micro-reactor may not be cheaper.

Other, EPC members asked questions of Mr. Williams about nuclear reactors. Mr. Herb Eckerlin asked what is done about security for small modular reactors (SMR) around 60 MW and how soon additional SMR could be available. Mr. Williams stated that SMRs are treated the same as nuclear power plants, so they have the same security as large nuclear plants. Mr. Williams also answered that Nuscale has a design on track to build by 2026 in Idaho. Mr. Paul Worley asked about the transport, disposal and solutions for nuclear waste. Mr. Williams stated that this is still a challenge because of the politics and not the budget. He shared that Congress is introducing new legislation focusing on the interim storage of nuclear waste fuel. Mr. Williams added in his closing comments that currently nuclear waste is safe because of the geology and nuclear engineering that has kept it safe.

Nuclear Generation at Duke Energy in North Carolina
Mr. Preston Gillespie, Senior Vice President and Chief Nuclear Officer, Duke Energy

Mr. Preston Gillespie provided an overview of Duke Energy's (DE) 6 Nuclear Power Plants (NPP) (totaling 11 nuclear reactors) in North Carolina (NC) and South Carolina. The three NC NPPs at Brunswick, Harris and McGuire have a total of 5 reactors that generate 5,329 megawatts (MW). He stated that nuclear energy provides more than 55% of the nation's electricity, is carbon-free generation, that NPPs operate 24/7 at over 90% of the time, and provide thousands of jobs. Mr. Preston also shared that DE's NPPs have a capacity factor (CF) of 93%, the 20th consecutive year with >90% CF, and provide about half of DE's generation in the Carolinas. DE's NPPs have avoided carbon dioxide emissions equal to keeping 14M cars off of the road, employed more than 5,000, and paid more than $308M in property and payroll taxes. He concluded that nuclear energy is a sustained success story for the Carolinas and that it provides safe, clean, and reliable electricity that customers depend on all day, every day.

During the presentation, Mr. Walker asked if the carbon avoidance being discussed by Mr. Gillespie was being compared to coal. Mr. Gillespie used the example of taking a certain number of cars of the road and stated that would be the amount of carbon avoidance. At the end of the presentation, Mr. Walker asked if additional regulatory laws are required if Duke Energy decides to stay with small modular reactors. Mr. Gillespie stated that staying with small modular reactors would require federal regulations instead of using current regulations. Mr. Walker stated that 2046 is when the license on the Harris nuclear plant expires and asked how long of an

extension could be given for the plant, and was told 20 years for the extension. Mr. Walker then asked if the Harris nuclear plant would still be useable after 2066 if the extension was given. Mr. Gillespie stated that if probably would still be useable.

Mrs. Sushma Masemore then joined the discussion by sharing that California is requesting an 80-year extension and asked Mr. Gillespie if he knew whether or not that extension would be approved. He answered that the West Coast is enthusiastic about renewables and to his knowledge they had no plans to extend. Mrs. Masemore then asked how did the nuclear plants operate during recent hurricanes. Mr. Gillespie shared that with the exception of Brunswick, the rest operated and removed units from operations during the storms as needed. He stated that Duke Energy did a great job during the recent hurricanes and their whole effort was viewed as a success. Gus Simmons then asked if the license for the Harris nuclear plant expired, could another nuclear power plant go on that site. Mr. Gillespie answered that another plant could be built on the site, but it would be like starting over from the beginning on the process to site a nuclear power plant.

Nuclear Energy Technology Update

Dr. Mohamed Bourham, Alumni Distinguished Graduate Professor of Nuclear Engineering, North Carolina State University

Dr. Mohamed Bourham summarized current nuclear technology trends and updates with special attention to small modular reactors (SMRs) and other new nuclear initiatives and enhancements. He discussed the Nuclear Engineering Department (NED) at NCSU by outlining its contributions to the manpower production, technology advancement, and national/international leadership in nuclear energy. Dr. Bourham referenced NED's strong connections to the nuclear industry, the national laboratories and the nuclear energy regulatory bodies.

He stated that nuclear power, which provides 56% of America's clean energy, is the most reliable U.S. energy source. He presented that nuclear's capacity factor (CF) of 92% far exceeds that of natural gas (55% CF), coal (54% CF), Hydropower (37% CF), wind (37% CF) or solar photovoltaic (27% CF). In spite of their high capacity factors, NPPs economic competitiveness is challenged by electric generation from inexpensive natural gas that leads to premature shutdowns, construction delays and cost overruns for two new projects, and policy changes to assure the survival of the existing NPPs. In closing, Dr. Bourham proposed strengthening NED and other NC nuclear energy-related entities cooperation by creating a NC Nuclear Energy Consortium similar to the existing Virginia Nuclear Energy Consortium (VNEC).

During the presentation, Mr. Walker asked if capacity factors are similar for small modular reactors and large nuclear reactors. Mr. Bourham stated that the capacity factors were similar. Mr. Rick Feathers asked if NC State University students in the Nuclear Engineering program were able to find jobs after completing their degrees. Mr. Bourham shared that his students were in high demand and getting great jobs thanks to entities such as Duke Energy, Westinghouse, Nuclear Regulatory Commission and others. Mrs. Masemore then asked what size reactor range was he demonstrating at NCSU. Mr. Bourham shared that NCSU was demonstrating a 1 MW water cooled, general test reactor and invited the group for a visit. Mr. Bourham concluded his comments by asking the EPC to develop a NC Consortium for Nuclear power similar to the one in the State of Virginia.

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CLOSING COMMENTS

Mr. Steven Walker opened the floor for public comments and none were offered. He provided closing remarks and concluded the meeting. The motion to adjourn was made by Mr. John Hardin, seconded by Mr. Bruce Barkley. The meeting adjourned at 11:30 a.m.

Approved by Energy Policy Council Members on August 21, 2019