

EXCEL SERVICES CORPORATION

Nuclear Engineering Consulting



Recent Development in Nuclear Energy Advanced Reactor Technical Summit

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Agenda

- I. Introduction/Background
- II. Clean Power Plan Implementation and Saving the Existing Fleet
- III. Premature Shutdown of Nuclear Plants and the Value of Nuclear Energy
- IV. Nuclear Power Plant as National Assets Legislation
- V. Virginia Nuclear Energy Consortium Authority and Impacts on Other States
- VI. Questions/Discussion



I. Introduction / Background

- Until 2013, the US had 104 operating reactors.
- In December of 2015, the US has 99 operating reactors and 1 in startup (Watts Bar 2) for a total of 100.
- There are 4 AP1000s in construction in Georgia and South Carolina
- There are 5 sites in some level of active decommissioning: Zion, San Onofre 2/3, Crystal River 3, Kewaunee, and Vermont Yankee



Introduction/ Background (Continued)

- Now there are announcements of 2 more premature shutdowns based solely on economic conditions. (Pilgrim & FitzPatrick)



II. Clean Power Plan Implementation

- The Environmental Protection Agency (EPA) issued the final Clean Power Plan (CPP) in August, 2015.
- The CPP requires each of the 48 contiguous states (Vermont and DC are exempted) to reduce the carbon emission levels by 32% for the 2005 levels by the year 2030.
- The CPP provides very little guidance how.



Clean Power Plan

Implementation (Continued)

- I am co-chairing the ANS Special Committee on Nuclear in the States, which will engage our members in state-by-state efforts to maintain the current nuclear fleet and support nuclear new builds.
- Intend to provide a consistent and standard approach for each of the states in valuing nuclear energy as an asset in their compliance with Section 111D of the Clean Power Plan.



Clean Power Plan Implementation (Continued)

- We formally rolled out Revision 1 of “Nuclear in the States Toolkit” of State and Federal tools/ actions to be taken to appropriately value nuclear in meeting the requirements of the Clean Power Plan to the Press and Media on Monday, February 8, 2016
- We received very good feed back from the Press
- Here is the Politico blurb from this morning:

WANNA KEEP NUCLEAR? YOU BETTER HAVE THE RIGHT GEAR: The American Nuclear Society hasn't necessarily cracked the code for saving the nation's nuclear power plants but they've collected a lot of recipes to do so. The group gave ME an unfettered sneak peek at the 40-page "toolkit" they're presenting today, which is aimed at extending lifelines to an economically shaken fleet of reactors - and you'd be hard-pressed to find a more comprehensive list. It's got everything you've thought of (power purchase agreements, clean energy standards), a few things you may have overlooked (selling a nuclear unit to another utility with a power plant nearby, like Exelon buying Fitzpatrick plant from Entergy), and some that advocates don't typically like to say in polite company (public ownership, utility re-regulation). Pete Lyons, DOE's former top nuclear energy official, Donald Hoffman of Excel Services, and nuclear economics consultant Edward Kee are presenting at 11 a.m. at ANS's D.C. office, 2000 M Street, NW. It'll be webcast too.



Clean Power Plan Implementation (Continued)

- Update from the Politico afternoon energy report:

SAVING NUCLEAR FOR NUCLEAR'S SAKE: The American Nuclear Society's first policy "toolkit" today is designed to help position the group as honest broker for those aiming to meet carbon goals and preserve a future for nuclear power in the U.S. at the same time. The group's 40-page report is a menu of options rather than a plan of action for helping market-challenged power reactors.

"We care a lot about the nuclear power industry in this country and we see this threat from markets as an existential threat," said Edward Kee, a nuclear economics consultant and co-chair of the effort. Kee warned that giving up on the existing fleet of nuclear power plants might mean ceding the industry's center of gravity to China. "In the end we could be buying nuclear power plants from China in the 2030 to 2050 range to meet our goals for carbon," he said. The group's leaders, including former DOE nuclear energy official Pete Lyons and Donald Hoffman of Excel Services, plan to press nuclear's case to any governor, regulator and state legislature willing to grant them an audience.



Clean Power Plan Implementation (Continued)

- We will tailor this Toolkit for each State administration to appropriately consider and value nuclear in the decision related to the energy, economy and environment in that State
- We will be presenting to the National Governors Association (NGA), the National Association of State Energy Officials (NASEO), and the National Association of Regulatory Utility Commissioners (NARUC), in Washington, D.C. in February 2016
- I will be personally visiting each Governor and his/her staff to discuss the State specific changes to make to the toolkit to assist in implementing the CPP



Clean Power Plan Implementation (Continued)

- We will roll out an “Impact of No Nuclear” Report in mid March 2016 that will outline the impacts of no nuclear energy by states regions and the nation
- We will rollout “Case Studies on the Effects of Nuclear Plant Closures and Models of Emissions and Power Generation” along with “Methods of Compliance with the Clean Power Plan” in mid April 2016 that will inform state and federal policy makers of the impacts of various actions related to nuclear power plants
- We will presenting a Consolidated Report and a Plan Forward to the ANS Board of Directors at the June 2016 ANS Annual meeting in New Orleans



Clean Power Plan Implementation (Continued)

- I have met with the Governors and their staffs of Virginia, Maryland, New Jersey and South Carolina
- We are now focused on New York, California, Ohio, Illinois and Massachusetts next
- We are coordinating with the Nuclear Energy Institute, Third Way and Nuclear Matters



Clean Power Plan Implementation (Continued)

- We are meeting with the EPA and Congressional leaders on this and other topics
- We are making presentations in the United States and globally about these efforts



III. Premature Shutdown of Nuclear Plants

- Two plants have already prematurely shutdown based solely on economic conditions: Kewanee and Vermont Yankee
- Entergy has announced two more site premature shutdowns based solely on economic conditions: Pilgrim, Fitzpatrick. Citing poor market conditions, reduced revenues, and increased operational costs → annual loss of \$40 million in revenue for Pilgrim.



Premature Shutdown of Nuclear Plants (Continued)

- US Energy Market is severely flawed.
- US Energy Market favors subsidized wind and solar.
- US Energy Market recognizes no unique value for Nuclear.
- The unique value of Nuclear is : Energy, Economy, and Environment



Energy

- Nuclear produces affordable, available, reliable energy 7 days per week/ 24 hours per day as the only environmentally friendly baseload energy supply.



Economy

- Each year, the average nuclear facility generates approximately \$490 million (US) in sales of goods and services.
- The same average nuclear facility will create nearly \$46 million (US) in total labor income
- Operation of the same average nuclear facility generates 700-1200 permanent jobs, which pay 36 to 42 percent more than average salaries in the local area and the state



Economy (Continued)

- Permanent jobs at nuclear plants create equivalent numbers of support jobs locally- grocery stores, restaurants, dry cleaners, car dealers
- Every dollar spent by the average nuclear plant produces \$1.04 in the local community
- Each nuclear plant generates an average of \$16 to \$20 million (US) in state and local tax revenue for schools, roads and similar infrastructure
- And the federal tax payments of each nuclear unit is roughly \$67 million (US)
- The cost of waste is included in nuclear and not in other energy sources



Environment

- Nuclear produces approximately 20% of the US energy but provides over 63% of the carbon free emitting energy in the US.



Actions

- We have reached out to the leadership of Entergy and to the Governor of New York to attempt to broker some agreement to keep FitzPatrick operating.
- Have also begun discussions with the state of New York to keep Indian Point operating
- Have also begun developing justification to keep Pilgrim operating
- Developing generic information to inform State and Federal Government officials about the value of nuclear
- We are preparing to meet with California Governor to discuss Diablo Canyon about need for the License Renewal



IV. National Assets Legislation

- I have proposed legislation that would have the Federal Government/ Congress formally acknowledge our Nuclear power plants as “National Assets”
- 1960’s,
Years of design, licensing and construction to place into operation at cost of hundreds of millions of dollars
- Now,
More years of design, licensing and construction to place into operation at costs of billions of dollars



National Assets Legislation (Continued)

- Provide a funding mechanism until such time as the plant could economically compete in the region in which it is operating.
- Currently in informal Senate/House Review for Consolidation in on existing Bill or other
- Hope for resolution in 2016.



V. Virginia Nuclear Energy Consortium Authority (VNECA)

- I currently chair the Virginia Nuclear Energy Consortium Authority (VNECA).
- VNECA is charged with the responsibility for making the Commonwealth a national and global leader in nuclear energy and to serve as an interdisciplinary study, research, and information resource for the Commonwealth on nuclear issues.
- VNECA reports directly to the Governor of Virginia. I am working with other state's governors to establish a similar type of entity to ensure that nuclear is valued as it should be.



QUESTIONS/ DISCUSSION



Thank You!



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