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To: Claunch, Chuck <Chuck.Claunch@duke-energy.com>
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CC: Pisarik, Holly <HollyPisarik@gov.sc.gov>
Baker, Josh <JoshBaker@gov.sc.gov>
Date: 3/22/2016 11:33:49 AM
Subject: RE: NYT Article - "Amid a Graying Fleet of Nuclear Plants, a Hunt for Solutions"

Thank you, Chuck – Looping in Holly and Josh from our office who are handling some nuclear related matters. We appreciate the info as always.

From: Claunch, Chuck [mailto:Chuck.Claunch@duke-energy.com]
Sent: Tuesday, March 22, 2016 11:31 AM
To: Patel, Swati; Schimsa, Rebecca
Subject: NYT Article - "Amid a Graying Fleet of Nuclear Plants, a Hunt for Solutions"

Good morning Swati and Rebecca,

Wanted to make your office aware of a New York Times article from yesterday, Amid a Graying Fleet of Nuclear Plants, a Hunt for Solutions.

The article incorrectly leaves the impression that Duke Energy is shutting down Robinson in 2030. The author got it wrong. We have not made a decision to end operation at Robinson in 2030 - to the contrary Duke believes that nuclear energy is a key component of our energy future (especially in a reduced carbon environment), all our plants are excellent candidates for life extension, and we are in the process of developing the business cases to confirm that extending the license is in the best interest of our customers and communities.

The key messages below were provided to the author. This information is public.

Thank you, Chuck

Key messages provided:

- Fuel diversity is important for our customers and company, now and in the future, and nuclear energy is a proven part of that diversity.
- Some of our Duke Energy nuclear generating units will approach the end of their renewed licenses in the early 2030s. At this time, we are carefully evaluating the opportunities and challenges associated with operating our units for an additional 20 years. We maintain rigorous, ongoing preventive maintenance programs across our nuclear fleet and have made many upgrades and investments at our sites to ensure continued safe and reliable operations well into the future.
- The Department of Energy and the Electric Power Research Institute, in consultation with the nuclear industry, have conducted research to better understand technical issues associated with the long-term, safe operation of nuclear power plants. This research has shown nuclear plants can be safely operated during a second license renewal period – no generic issues have been identified that would prevent the safe operation of the plants beyond their current 60 year licenses
- We believe our plants are good candidates for second license renewal and are evaluating license extensions for our units from 60 to 80 years.
 - If we pursue extended licenses, it will provide us the opportunity to operate the plants up to 80 years if it makes economic sense and provides benefits to our customers. Second license

renewal provides the regulatory option for extended operation.

Amid a Graying Fleet of Nuclear Plants, a Hunt for Solutions

By [HENRY FOUNTAIN](#) MARCH 21, 2016



The H.B. Robinson nuclear power plant in South Carolina is one of the oldest still operating in the United States. Credit Travis Dove for The New York Times

The H.B. Robinson nuclear power plant, about 70 miles from Columbia, S.C., has been producing electricity with few interruptions since the Nixon administration. But as of now, its fate is clear: The plant will have to shut down by 2030, when it will be six decades old.

The Robinson reactor is one of the oldest still operating in the United States, but others are getting on in years. From 2029 to 2035, three dozen of the nation's 99 reactors, representing more than a third of the industry's generating capacity, will face closure as their operating licenses expire.

Any shutdowns would be another blow to [nuclear energy](#), which provides 19 percent of the nation's electricity but has struggled in recent years to compete against subsidized solar and wind power and plants that burn low-priced natural gas. Industry advocates say that by removing sources of clean electricity — a nuclear reaction produces no carbon dioxide or other greenhouse gases — the closings could affect the government's ability to fulfill its pledge, made at the [Paris climate talks](#) last year, to reduce emissions.

And to continue to meet the nation's electrical load, new generating capacity will have to be built to replace any that is lost.

"Some of those plants are going to be retiring," said Stephen E. Kuczynski, the chief executive of Southern Company's nuclear subsidiary. "Which means we're going to need to meet this load with something."

Given the sometimes glacial pace of design, licensing and construction in the nuclear industry, the 2030s are not far-off. Plant operators may be able to buy time by seeking license extensions for another 20 years from the [Nuclear Regulatory Commission](#), or by building more large reactors like four that are under construction.

The industry and the [Department of Energy](#) are also pinning their hopes on the development of less

conventional reactor designs that are meant to be safer and cheaper to build and operate. Yet it is unclear whether any new designs could reach the market in time to make a dent in the generating capacity lost as plants are closed.

Some in the industry are bullish, including Southern, which [announced in January](#) that it would receive up to \$40 million from the Department of Energy to develop an advanced reactor that uses molten salt as a coolant instead of water, which all current designs use.

“Our target is — can we really move the process forward and have a commercial option by 2030?” Mr. Kuczynski said. To do that, he and others say, the pace of the design process, and of the [Nuclear Regulatory Commission](#)’s review process, needs to be sped up.

But some say the shortened timetables are unrealistic, given safety and other concerns and the need to test new designs before seeking approval from the commission.

“It’s a 25-year process, no matter what,” said Michael McGough, the chief commercial officer of NuScale Power, which is the furthest along among companies working on less conventional reactors. NuScale’s design, called a [small modular reactor](#), uses water as a coolant, but the units are far smaller than current reactors and have advanced safety features. They could be built largely in a factory, saving money, and up to 12 of them could be installed at one site.

Mr. McGough knows all about long timetables; NuScale’s design has been under development since 2000. It has lined up a potential first customer, Utah Associated Municipal Power Systems, or Uamps, which operates in the Intermountain West, and hopes to have 12 of the small reactors operating at a site in Idaho by the mid-2020s. “It’s improbable to me that you will see any new design developed or licensed in a much shorter time frame than the kind we’re on,” Mr. McGough said.

NuScale has been testing its design for 13 years, using a nonnuclear prototype. Later this year, it plans to submit an 11,000-page application to the N.R.C. to have its design certified. The commission then has up to 40 months to review the application.

The certification process, and a later application by Uamps for a construction and operating license, could be delayed if the N.R.C. asks for more information. But even if all goes smoothly, the plant will produce only about half the electricity of many existing reactors. About 50 of these 12-reactor plants would be needed to replace the generating capacity that could be lost by 2035.

Many in the industry hope that extending the licenses of existing reactors will forestall at least some closings. Nuclear plants were originally licensed for 40 years, but almost all have sought and received 20-year extensions.

The regulatory commission has begun researching what would be required to extend a plant’s life to 80 years. “We’re asking very basic questions, like how long can a reactor vessel remain acceptable since it’s being bombarded by neutrons,” said Scott Burnell, a spokesman. “The information we have at this point is that those are issues that are not showstoppers.”

So far one operator has announced plans to seek such an extension, for two reactors set to close in the early 2030s, but an application and possible approval are still years away. Duke Energy, owner of the Robinson plant in South Carolina, said it was evaluating whether to pursue an extension.

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Given the relatively poor economics of nuclear power, however, even if a plant could be licensed to operate up to 80 years, the question remains whether it would be financially worthwhile for it to do so, especially if expensive work is required. Skeptics cite two American plants that [have been closed](#) for economic reasons since 2012, after their licenses were extended to 60 years.

Similar economic uncertainties surround the latest generation of reactors, the [Westinghouse AP1000](#), a design that is similar in many respects to existing units but has safety improvements and cost-saving features. Four of these are being built in the United States, and there have been lengthy construction delays and ballooning costs. But Mr. Kuczynski of Southern, which is building two of the reactors in Georgia, said the industry was learning from experience, which would lower the cost of subsequent plants. “We’re going to get through the first of a kind,” he said, and any future orders “are going to be just terrific bargains.”

Others are not so sure the industry will rush to build more. “What eventually happens with the four AP1000s will be very important,” said Matthew McKinzie, a senior scientist with the [Natural Resources Defense Council](#). “If the economics of extending the lifetime of a plant to 80 years are poor, then what does that say

about the economics of a new plant?”

Critics of nuclear power say that novel designs like molten salt reactors raise new issues, especially regarding safety, that will require much time to evaluate.

“A regulator can’t accept paper studies saying that a reactor is supersafe,” said Edwin Lyman of the [Union of Concerned Scientists](#). “They need documentation, experimental data.”

“The industry and Department of Energy have this fantasy that you can have some general design-neutral licensing process,” he added.

But Ray Rothrock, a venture capitalist who has invested in two companies working on advanced designs, said time was running out to improve the process.

“We’ve got probably a five- to 10-year window,” he said. “If we don’t get this fixed in the next presidential administration or so, we’ve missed it.”

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