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United States Senate

October 19, 2015

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The Honorable Stephen G. Burns
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Chairman Burns,

I write to request information about how extreme weather, higher water temperatures, and the effects of climate change may impact the U.S. nuclear power industry in light of the increase in the number of plant shutdowns and other events that have occurred at the Pilgrim Nuclear Power Station in Plymouth, Massachusetts and at other reactors across the country.

In January 2015, an unusually strong nor'easter that brought three feet of snow and hurricane-force winds to New England prompted an automatic shutdown of the Pilgrim Facility for twelve days due to electric grid reliability concerns¹. Pilgrim was again shut down pre-emptively due to threats from another nor'easter in February¹. These winter storms contributed to the record-breaking snowfall in Massachusetts this past winter, in line with the observed trend of increasing extreme precipitation in the United States, and especially the Northeast, from global warming.

Other extreme weather events have also threatened the safe operation of U.S. nuclear power plants, including tornado outbreaks, hurricanes, and droughts. Tornadoes have caused several nuclear plant shutdowns in the last five years, including the Browns Ferry plant in Alabama, the Surry Power Station in Virginia, and the Fermi 2 Plant in Michigan^{2,3}. In 2011, the Wolf Creek nuclear power plant in southeastern Kansas was identified as being vulnerable to tornadoes just weeks before a deadly twister ravaged Joplin, Missouri, just 150 miles away³. Hurricane Irene threatened at least nine nuclear reactors from North Carolina to Massachusetts with damaging winds, loss of power, and flooding⁴.

Rising water temperatures, exacerbated by global warming, have also directly impacted nuclear power plants^{5,6}. For operational safety, the Nuclear Regulatory Commission (NRC) set the federally

¹ <http://www.capecod.com/newscenter/pilgrim-power-station-taken-line-storm/>

² <http://www.nrdc.org/nuclear/fallout/>

³ http://usatoday30.usatoday.com/news/nation/2011-05-28-tornadoes-nuclear-plant_n.htm

⁴ <http://www.markey.senate.gov/news/press-releases/august-29-2011-markey-hurricane-irene-exposes-holes-in-nuclear-plant-safety-regulations>

⁵ http://green.blogs.nytimes.com/2012/08/13/heat-shuts-down-a-coastal-reactor/?_r=0

⁶ <http://news.nationalgeographic.com/news/energy/2012/08/120817-record-heat-drought-pose-problems-for-electric-power-grid/>

mandated maximum allowable temperature for nuclear power plant intake cooling water to 75 degrees Fahrenheit. If a plant's intake water exceeds this limit, the plant must shut-down or decrease power levels until the intake temperature returns to the compliance level. The Pilgrim Nuclear Power Station had to reduce power this summer due to high water temperatures of the Cape Cod Bay, from which the plant draws its cooling water. This was the fourth time Pilgrim had to take such action during the plant's 43-year operational life and all four instances have occurred in the last three years. An August 11, 2015 Boston Globe article⁷ reported that the operators of the Pilgrim plant sent a request to the NRC for permission to increase the maximum allowable limit of the water intake temperature for that facility to 80 degrees Fahrenheit. This and past actions at other reactors may signal that plant operators believe that partial or full shutdowns may become regular occurrences. As the risk of elevated water temperatures continues to rise, so will the risk of nuclear power plant full or partial shutdowns or requests for regulatory relief that are related to high water intake temperatures.

As the Ranking Member of the Subcommittee on Superfund, Waste Management, and Regulatory Oversight, I would like to better understand the safety and reliability concerns of nuclear power plants that may be associated with extreme weather and global warming. Please provide the following information:

During the last 10 years, please list every reactor shutdown, or power generation reduction that occurred entirely or in part due to:

1. Increased cooling water intake temperatures
2. Tornadoes
3. Hurricanes
4. Blizzards
5. Other extreme weather events
6. Flooding (other than flooding caused by any of the events listed above)
7. Wildfires
8. Low water levels of water intake sources
9. Combination of above factors

For each occurrence identified above, please also provide the following information:

- A. Facility name, location, operator, and owner
- B. The dates and duration of shutdown or power generation reduction
- C. The generating capacity that was affected

In addition, please provide a list of every time during the last ten years:

- I. The NRC received a request for permission to increase the water intake temperature at a facility including the justification of the request and any data on the intake temperature at that facility.

⁷ <https://www.bostonglobe.com/metro/2015/08/11/high-water-temperatures-forced-power-cut-pilgrim-nuclear-plant/fMgG6VtRmadnVcuacbPpGI/story.html>

- II. The NRC's response to the request, the justification and analysis used to make the decision, the new limit (if any), and information used to assure safe operations if a higher limit was permitted.

Thank you for your consideration of this request. Please provide a full and complete response to this request as soon as possible and no later than close of business on November 20, 2015. If you have questions or concerns, please contact Briana Tomboulion or Michal Freedhoff at 202-224-2742.

Sincerely,



Senator Edward J. Markey

Ranking Member Subcommittee on Superfund,
Waste Management, and Regulatory Oversight