

JOHN McCAIN, ARIZONA  
ROB PORTMAN, OHIO  
RAND PAUL, KENTUCKY  
JAMES LANKFORD, OKLAHOMA  
MICHAEL B. ENZI, WYOMING  
KELLY AYOTTE, NEW HAMPSHIRE  
JONI ERNST, IOWA  
BEN SASSE, NEBRASKA

THOMAS R. CARPER, DELAWARE  
CLAIRE McCASKILL, MISSOURI  
JON TESTER, MONTANA  
TAMMY BALDWIN, WISCONSIN  
HEIDI HEITKAMP, NORTH DAKOTA  
CORY A. BOOKER, NEW JERSEY  
GARY C. PETERS, MICHIGAN

## United States Senate

COMMITTEE ON  
HOMELAND SECURITY AND GOVERNMENTAL AFFAIRS

WASHINGTON, DC 20510-6250

CHRISTOPHER R. HIXON, STAFF DIRECTOR  
GABRIELLE A. BATKIN, MINORITY STAFF DIRECTOR

March 24, 2016

The Honorable Stephen G. Burns  
Chairman  
Nuclear Regulatory Commission  
11545 Rockville Pike  
Rockville, MD 20852

Dear Chairman Burns:



As you know, nuclear power serves as our nation's largest source of reliable, carbon-free energy and plays an important role in our efforts to address climate change. However, as the United States' commercial nuclear reactor fleet ages and has begun to shutter in recent years, we must understand the challenges of replacing this fleet with new technology. I write today to better understand the efforts of the U.S. Nuclear Regulatory Commission (NRC) to prepare for these new technologies and safely license the next generation of advanced nuclear reactors.

Key initiatives in the past several years have identified technical, regulatory, and financial support necessary to move advanced nuclear reactor designs toward commercialization while ensuring the continued safe, reliable and economic operation of the existing nuclear fleet. Last year, President Obama announced the Gateway for Accelerated Innovation in Nuclear (GAIN) Initiative to support advanced nuclear technology development and deployment. The initiative requested the NRC provide information to the Department of Energy (DOE) information on NRC's regulatory expertise and guidance for advanced nuclear technology.<sup>1</sup> A demonstration of advanced nuclear technology at government sites such as the national laboratories could provide the opportunity to develop the regulatory requirements needed for subsequent licensing.

While advanced nuclear reactor designs offer the promise of improved safety, less waste, and flexibility, licensing regulations were developed based primarily on light-water technologies and are performed in the same manner today as when the agency was established.<sup>2</sup> Advanced nuclear designs would likely requiring numerous exemptions and extensive research to demonstrate economic feasibility and safety, creating uncertainty for applicants.

Under the current regulatory framework, the time frames for an advanced reactor design would be longer and potentially more costly because of the need for more adjustments and exemptions. According to Government Accountability Office, designing and certifying an

<sup>1</sup> The White House, Office of the Press Secretary, *Fact Sheet: Obama Administration Announces Actions to Ensure that Nuclear Energy Remains a Vibrant Component of the US Clean Energy Strategy*, Nov. 6, 2015.

<sup>2</sup> See 10 C.F.R. Part 50 and 10 C.F.R. Part 52

advanced nuclear reactor design would cost an estimated \$1 to \$2 billion.<sup>3</sup> In addition, the licensing and construction can take nearly a decade or more after a design is submitted before a reactor is operational. Given the long timelines involved, decisions made now about preparing for advanced nuclear reactors impact the nuclear industry's ability to replace its commercial nuclear reactor fleet with new technology. In July 2013, NRC and DOE established a joint initiative to develop Principal Design Criteria for Advanced Reactors to address open policy issues and update regulatory guidance for licensing advanced nuclear technologies by December 2016.<sup>4</sup>

I appreciate the steps NRC has taken so far to modernize the licensing process to accommodate advanced nuclear designs while upholding its mission as an independent regulator to ensure a safe nuclear industry. To gain a better understanding of the challenges the NRC faces to license next generation of advanced nuclear reactors, I am writing to ask you to please address the following questions:

1. Please explain how NRC will work with DOE and any other entities to understand and navigate the regulatory process for licensing new reactor technology in accordance with President Obama's GAIN initiative.
2. In 2015 congressional testimony, you explained that there may be challenges and knowledge gaps within NRC and the prospective applicants if NRC were to receive an advanced reactor application within the next five years.<sup>5</sup> Please describe the challenges related to research and modeling work in both the technical issues and code development for non-light-water reactor designs.
3. In the guidance for Developing Principal Design Criteria for Advanced Reactors, DOE indicated six different advanced reactor technologies to consider for creating regulations for licensing innovative technologies. Please describe whether there is a critical skills gap at NRC to address the non-light-water reactor design research and modeling work in order to be able to consider an application for an advanced nuclear reactor.
4. According to the Omnibus Budget Reconciliation Act of 1990, NRC's budget must provide for 90 percent fee recovery less the amounts appropriated for generic homeland security activities and waste incidental to reprocessing activities. Please explain how this impacts NRC's ability to meet staffing and resource priorities for addressing advanced non-light water technology.
5. Does the NRC need any additional authority or funding outside of the OBRA-90 fee recovery requirement to expand its technical staff and make more use of other government affiliated research organization to create new standards for advanced reactors?

---

<sup>3</sup> Government Accountability Project, *Nuclear Reactors: Status and Challenges in Development and deployment of new Commercial Concepts*, GAO-15-652, July 2015.

<sup>4</sup> Idaho National Laboratory, *Guidance for Developing Principal Design Criteria for Advanced (Non-Light Water) Reactors* (Dec. 2014).

<sup>5</sup> Statement of Stephen G. Burns, Chairman of the U.S. Nuclear Regulatory Commission, before the Senate Environment and Public Works Committee (Oct. 7, 2015); *see also* Statement of Stephen Burns, Chairman of the U.S. Nuclear Regulatory Commission, before the House Committee on Energy and Commerce, Subcommittee on Energy and Power, and Subcommittee on Environment and the Economy (Sept. 9, 2015).

6. How does the NRC interface with the Department of Energy and industry so the regulatory uncertainties and corresponding business risk associated with commercialization of advanced nuclear energy technologies are reduced?
7. The NRC has taken many steps to improve the effectiveness, efficiency, and agility of NRC by 2020 through Project AIM. The report indicates NRC's internal process for responding to changes by transferring resources makes it difficult to respond quickly to changes. Would the Nuclear Regulatory Commission require organizational changes to enable responsiveness to advanced non-light-water design research, technical work, and licensing?
8. In the 2017 budget request, NRC prioritized funding for the development of a regulatory infrastructure for advanced nuclear reactor technologies.<sup>6</sup> Please indicate which offices are responsible for developing the regulatory infrastructure for advanced nuclear technologies and their respective roles.

Please provide this information by April 25, 2016 if at all possible. [REDACTED]

[REDACTED] Thank you very much for your assistance in this matter.

With best personal regards, I am

*Many thanks!  
All the best!*

Sincerely yours,



Tom Carper  
Ranking Member

cc: The Honorable Ron Johnson  
Chairman

---

<sup>6</sup> U.S. Nuclear Regulatory Commission Congressional Budget Justification FY2017 (NUREG-1100, Vol. 32).