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July 5, 2018

The Honorable Rick Perry  
Secretary of Energy  
U.S. Department of Energy  
1000 Independence Avenue, S.W.  
Washington, D.C. 20585

### **Need for High-Assay Low Enriched Uranium**

Dear Secretary Perry:

The Nuclear Energy Institute appreciates the Department of Energy's leadership and commitment to helping preserve and strengthen the civil nuclear energy sector. In particular, the Department's support for the development of innovative technologies, including the next generation of advanced reactors, and advanced fuels for the existing fleet of reactors, will help ensure that nuclear power continues to bolster America's national security by providing the dominant source of resilient, carbon-free power in the United States.

The existing fleet of reactors in the United States runs on uranium fuel that is enriched up to 5% Uranium-235. On the other hand, many advanced reactor designs and at least one advanced fuel design for the existing fleet require High-Assay Low Enriched Uranium (HALEU), uranium that is enriched between 5% and 20%. Currently, commercial nuclear fuel suppliers, with the possible exception of Russia, can only produce uranium enriched to 5%.

To help bridge this gap in supply, NEI, on behalf of the industry, requests that the Department of Energy (DOE) provide an interim supply of HALEU and thereby accelerate the development of both HALEU fuel infrastructure and advanced reactors and advanced fuels that require HALEU. The DOE currently has material that could be used for this interim HALEU supply: DOE possesses an inventory of high-enriched uranium that could be downblended to HALEU, and DOE also manages spent high-enriched fuel that could be processed and converted into HALEU.

The development, demonstration, and deployment of many advanced nuclear technologies is in jeopardy since there is no certainty that a HALEU fuel infrastructure will be in place when they are ready to enter the market. At the same time, investment into a HALEU fuel infrastructure is highly unlikely given the market uncertainty. As the Administration continues to review civil nuclear energy policy, it is important to recognize that the federal government is in a key position to accelerate the development of this infrastructure by providing an interim supply of HALEU fuel and supporting the development of future facilities.

The Honorable Rick Perry  
July 5, 2018  
Page 2

NEI has surveyed advanced reactor developers and fuel designers that utilize HALEU to identify their annual needs to 2030. The attached table provides this data. The names of the companies and the specific reactor designs have been withheld. This table does not necessarily represent the needs of all developers utilizing HALEU, and it does not provide the uranium needs for those companies whose designs utilize uranium enriched to 5%. The data provided represent a range of advanced reactor technologies and a range of reactor sizes from a few Megawatt-electric to hundreds of Megawatt-electric. The table will be updated as new data become available. Although the annual HALEU needs listed may seem rather large by 2030, they are only a fraction of the approximately 2,000 metric tons of uranium used annually by the existing fleet in the United States. As a result, it is challenging to establish a domestic commercial supply of HALEU in the near term. Without a HALEU supply chain, many advanced reactor designs and advanced fuels will simply not be developed.

NEI appreciates the Department of Energy's attention to this urgent issue and we will continue to work with the Department to ensure that the advanced reactor developers and advanced fuel designers have the fuel that they need when they need it. Please feel free to contact me or Everett Redmond (elr@nei.org; 202-739-8122) if you need additional information.

Sincerely yours,

A handwritten signature in cursive script that reads "Maria Korsnick". The signature is written in black ink and is positioned above the printed name.

Maria Korsnick

Attachment

c: Dan Brouillette, U.S. Department of Energy  
Ed McGinnis, U.S. Department of Energy  
John Herczeg, U.S. Department of Energy  
Shane Johnson, U.S. Department of Energy  
Francis Brooke, White House, National Economic Council  
Aaron Weston, White House, National Security Council

**Estimated Annual Requirements for High Assay Low Enriched Uranium to 2030 (MTU/yr)**

<b>Company</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>Total</b>	<b>Cumulative</b>
<b>Enrichment Range</b>	13-19.75%	19-19.75%	10-19.75%	15.5%	19.75% and 12.6%	19.75%	17.5%	14.4%		
<b>Year</b>										
2018	0.001			0.025					0.026	0.026
2019	0.006	1.5							1.506	1.532
2020	0.7	1.5	0.01						2.21	3.7
2021	0.7	2.5				1.0			4.2	7.9
2022	0.7	3.0							3.7	11.6
2023	0.7	3.5	1.1		13.5				18.8	30.4
2024	0.7	5.0	1.1			3.0		0.5	10.3	40.7
2025	0.7	6.0	1.8	0.4		3.0		0.5	12.4	53.1
2026	23.3	7.0	1.8	0.4		3.0	21.4	0.5	57.4	110.5
2027	35.0	9.0	1.8	0.9		5.0	21.4	0.5	73.6	184.1
2028	46.6	11.0	1.8	1.8		25.0	21.4	0.5	108.1	292.2
2029	58.3	13.0	1.8	1.8		15.0	21.4	0.5	111.8	404.0
2030	70.0	13.5	1.8	1.8	61.0	15.0	21.4	1.0	185.5	589.5

Notes:

- The material needs listed above are in metric tons of uranium per year and are a fraction of the approximately 2000 MTU used annually by the existing fleet of reactors.
- The year the material is needed is for fuel fabrication. Insertion in the reactor and reactor operations will occur in a later year.
- The material needs that are less than 1 MTU/year are for irradiation samples, lead test rods and lead test fuel assemblies.
- The material needs represent a few scenarios
  - The deployment of advanced fuel in the existing fleet of light-water reactors.
  - The deployment of multiple reactors of the same design that will not require refueling before 2030.
  - The deployment of reactors that have annual refueling requirements.
- These reactors include a range of sizes from a few Megawatt electric to 100s of Megawatt electric.