July 2, 2018

Congressman Fred Upton
Chairman, Subcommittee on Energy
Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, DC 20515-6115

Dear Congressman Upton:

On behalf of URENCO USA and the US Nuclear Industry Council (USNIC) I would like to express my appreciation for the opportunity to appear before the Subcommittee on Energy on Tuesday, May 22, 2018 to testify at the hearing entitled "DOE Modernization: Legislation Addressing Development, Regulation, and Competiveness of Advanced Nuclear Energy Technologies."

Please find enclosed our responses to additional questions for the record that we received from the Subcommittee on June 19, 2018. I appreciate the opportunity to clarify for the Subcommittee the importance of identifying how existing commercial nuclear assets in the U.S. can be best used to advance our nuclear industry, thereby limiting the amount of time and funds necessary to stand up this critical capability.

Should the Subcommittee have any further questions or briefing needs, we would be pleased to support those requests as best as we can.

I would also like to take this opportunity to invite you and the members of the Subcommittee to tour our uranium enrichment plant in Eunice, NM to provide a first-hand understanding of the need to protect and take advantage of these critical national facilities.

Thank you again for the opportunity to testify before the Subcommittee.

Sincerely,

[redacted]

Melissa Mann
President
URENCO USA, Inc.

**URENCO USA Inc.**
1560 Wilson Boulevard Suite 300, Arlington, Virginia 22209 - 2463, USA T: +1 703 682 5208 F: +1 703 465 2784
E: melissa.mann@urenco.com W: www.urenco.com

July 2, 2018

## RESPONSE TO CONGRESSMAN FLORES' QUESTIONS FOR THE RECORD

1. **Your testimony notes the many different steps that are required to advance in a concurrent fashion to align the timeframe to deploy advanced reactors with the material availability. What is the expected length of time to do the following:**

   **a. About how long would it take to develop the criticality benchmark data to inform the different regulatory requirements?**

   Nuclear criticality control is a key requirement for nuclear facility operations and the industry and national laboratory system have a good supply of qualified criticality experts. A focused program should be able to yield solid criticality analyses within a 24-month period. Ideally, such a program would be developed on a consortium basis with backing from the U.S. Department of Energy (DOE).

   The value of such an undertaking is to provide a consistent set of data that can be utilized by reactor and fuel designers, fuel cycle facilities, and transportation package designers alike. This approach would also mean that the U.S. Nuclear Regulatory Commission (NRC) would not have to independently verify multiple, bespoke benchmarking codes.

   **b. About how long would it take to design, test, certify, and construct the transportation packages?**

   Packages designed for the transport of fissile nuclear materials on public roads must meet rigorous performance standards. There are additional requirements imposed on packaging HA-LEU materials in the form of uranium hexafluoride ($UF_6$). Industry experience shows that the process of designing, testing, licensing and manufacturing such packages is a multi-year process, likely to require four to seven years on average.

   An alternative approach for managing $UF_6$ packaging needs would be to consider the co-location of HA-LEU enrichment and conversion facilities. Such co-location would allow consolidation of HA-LEU processing at fewer sites and would obviate the need to transport HA-LEU as $UF_6$ on public roadways, thus reducing the expenses and time associated with the development, licensing and manufacture of new packages for this transport segment.

   **c. What is the expected time for you to go through the process to modify URENCO USA's NRC license to be a Category-2 facility?**

   The NRC reviewed, approved and issued the initial combined construction and operating license for the URENCO USA uranium enrichment facility in Eunice, New Mexico in just over 30

months. This was a first-of-a-kind approval for use of advanced gas centrifuge enrichment technology in the United States.

The URENCO USA facility currently produces low enriched uranium at an enrichment level of less than 5.0% $^{235}U$. At this enrichment level, the facility is licensed to Category III physical protection requirements.

The full gamut of HA-LEU enrichments (up to ~19.75% $^{235}U$) falls into Category II physical protection requirements. Licensing of a HA-LEU enrichment capability at the URENCO USA site would require either that the entire facility be upgraded to Category II physical protection requirements or that a small HA-LEU capability be separately licensed on site as a Category II facility. In either scenario, URENCO USA is able to rely on existing site characterization data, utilities, plant processes, safety control systems, etc. – all of which are already familiar to the NRC - while ensuring that additional requirements for Category II operations are met in full.

Assuming that the NRC has clearly defined requirements for Category II facilities, review and approval of a HA-LEU capability at the URENCO USA site should be feasible within a 24 to 30-month period.

**d. About how long would it take to construct the new enrichment capabilities at your facility?**

We estimate that if detailed design, site permitting and contractor selection were undertaken during the NRC application review process, URENCO USA could construct, commission and start up a HA-LEU production module within 24 months of NRC license approval. This estimate reflects our actual construction experience for the most recent construction phases at the URENCO USA facility.

**e. About how long do you expect it might take to do the similar work at the fuel fabrication facilities?**

While URENCO USA and fuel fabrication facilities are held to similar regulatory requirements, URENCO USA is not in a position to speak directly for the fabrication community. The answer will likely largely depend on whether existing fabrication facilities can be utilized or whether greenfield sites are proposed, but our hope is that the NRC would be able to review, approve and issue other fuel cycle licenses in a relatively similar time frame as for enrichment activities.

One means of reducing the time and burden associated with new licensing reviews (as well as reducing the number of transportation steps and packaging requirements) is to consider co-locating a HA-LEU enrichment capability with conversion and fabrication capabilities. As stated during the May 22, 2018 hearing, URENCO USA is willing to consider hosting such capabilities at its New Mexico site.

**f. Are there other items that have not been mentioned that need to be addressed, such as uranium mining facilities or conversion facilities?**

A complete and sustainable HA-LEU fuel cycle would include three fundamental capabilities: (1) a uranium enrichment facility producing HA-LEU enrichments in the form of uranium hexafluoride ($UF_6$); (2) a conversion facility to convert HA-LEU $UF_6$ into metal or oxide as appropriate for different reactor designs and fuel types: and (3) one or more fabrication facilities that can manufacture the specific fuel types required by the various reactor and fuel designs. As such, a conversion capability is as important as the enrichment and fabrication steps.

**g. Based on your experience in the fuel cycle, when do all the steps described above have to be completed by to provide the fuel for deployment?**

DOE is already seeking a HA-LEU capability for research and test reactor use in the relative near term. Additionally, advanced reactor and advanced fuel designers are seeking supply of test quantities of material to demonstrate viability in the mid-2020s, and seeking commercial supply shortly thereafter.

URENCO USA is interested in and capable of serving a broad community of users who stand to benefit from HA-LEU supply. This includes: (1) research and test reactors, including reactors fueled by DOE in the U.S. and abroad; (2) advanced reactors; (3) advanced fuel designs including Accident Tolerant Fuels; (4) producers of targets for medical isotope production; and (5) operators of existing light water reactors seeking improvements in fuel reliability and costs through high fuel burnup and extended operating cycles.

**2. Based on that description, it is clear there is a sense of urgency to initiate this program now?**

Absolutely, there is a sense of urgency to pass the draft legislation and initiate this program. Near-term action in developing a viable HA-LEU fuel cycle - including availability of appropriate packaging - is required to ensure that lack of fuel does not hinder operation of existing research and test reactors or the ability to benefit from the development and possible broad-scale deployment of advanced reactors and advanced fuel types.