TerraPower

October 27, 2016

Mr. John Kotek
Assistant Secretary, Office of Nuclear Energy
U.S. Department of Energy
1000 Independence Ave., SW
Washington, DC 20585

RE: Expression of Support for a Fast Spectrum Test Reactor/Facility

Dear Mr. Kotek,

We understand that the Department of Energy has considered, and is considering, the design, development, and deployment of a fast spectrum test reactor. Based on the arguments and examples below, **TerraPower strongly supports and encourages this effort**.

TerraPower was formed to address the expanding need for energy worldwide to combat poverty and disease, while being mindful of the environmental consequences of increasing energy output. We have focused on innovative nuclear-based designs as a way to answer these challenges, namely, to significantly reduce carbon emissions and combat climate change, while providing the energy needed to raise the standard of living globally. Our goal is to develop and deploy nuclear energy systems that provide advantages and improvements in energy security, the environmental footprint, economics, safety, and proliferation resistance as compared to current systems.

In order to meet these goals, high uranium utilization without reprocessing is a key attribute, and is achievable using advanced fast reactor concepts (e.g., the Traveling Wave Reactor, and Molten Chloride Fast Reactor). The fuel used in these reactors must attain peak burnups that are 50% higher and fluences that are more than twice those previously experienced. As these limits will push the boundary of current knowledge and practice, facilities are needed that provide prototypic fuel and material conditions necessary for validation and licensing. Unfortunately only a handful of reactors exist that can provide the appropriate environment, all exist outside of the U.S., and only one is realistically available (BOR-60 in the Russian Federation). The challenges in using these facilities is enormous – important testing can be terminated overnight due to non-technical issues; limited test space exists due to multiple users and priorities; export licenses needed for fuel tests typically have long timeframes; most facilities are nearing the end of their lifetimes; some are actually commercial or demonstration power plants that are not currently capable of meeting testing needs; etc.

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Although TerraPower would prefer the deployment of a fast spectrum test reactor in the U.S. as soon as possible, we understand that it will take time for this to occur. Therefore, we would be happy to discuss the possible schedule and specific testing requirements for such a facility, and how we might assist in making it a reality.

Sincerely,

Christopher Levesque
President, TerraPower, LLC

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