



Department of Energy
Washington, DC 20585

February 17, 2016

Mr. Joseph Grimes
Chief Nuclear Officer
Tennessee Valley Authority
LP-3
1101 Market Street
Chattanooga, TN 37402

Dear Mr. Grimes:

As you are aware, the U.S. Department of Energy (DOE) has keen interest in the development of clean energy technologies having the potential to improve the environmental, economic, and energy security outlook for the United States. As a means of achieving this goal, DOE has been supporting the design development and licensing of small modular reactors (SMRs) through our SMR Licensing Technical Support (SMR LTS) program. We believe that SMRs have the ability to enable the timely and efficient transformation of the Nation's energy infrastructure, reestablish U.S. leadership in clean energy technologies, maintain a vibrant U.S. effort in science and engineering, and critically enhance national security by providing robust power for critical national security missions.

DOE operates a number of facilities involving national security and mission-critical activities that have substantial electricity requirements. These missions include nuclear nonproliferation efforts; ensuring the safety and security of the U.S. nuclear weapons stockpile; resolving key scientific, environmental, climate, and energy security problems; and protection against cyber and physical attacks on U.S. energy infrastructure. The Department of Defense (DOD) also operates many large bases and facilities with mission-critical infrastructure dependent on reliable electricity. Electricity supply to facilities important to national security and key scientific missions is potentially vulnerable to natural phenomena (e.g., tornados, floods), physical terrorist acts (e.g. aircraft impact, sniper attack), and cyber-attacks. In addition, analysis in support of national security and scientific missions requires substantial electricity intensive computing power. These computing and analysis needs are expected to increase over the coming decades, driving power requirements and reliability requirements higher, thus increasing the importance of providing sources of secure, reliable power.

In addition to the physical requirements, current executive directives mandated Federal agencies to take actions to reduce greenhouse gas emissions, and have recognized SMRs as a potential solution. Specifically, Executive Order 13514 (October 2009), *Federal Leadership in Environmental, Energy, and Economic Performance*, directed all Federal Agencies to reduce their greenhouse gas emissions by 28 percent by 2020. This was followed by Executive Order 13693 (March 2015) *Planning for Federal Sustainability in the Next Decade*, which called for further reduction of Federal facility greenhouse gas emissions and DOE has set a 50% reduction goal for certain greenhouse gas emissions by 2025. DOE has also identified SMRs as one of the "alternative energy" options for meeting clean energy goals. In fact, the Oak Ridge National Laboratory (ORNL) identified SMR technologies as a "significant factor in the reduction of



GHG emissions” for their facility in their 2015 Site Sustainability Plan.¹ In addition to this, the 2010 National Defense Authorization Act directed DOD to “conduct a study to assess the feasibility of developing nuclear power plants on military installations.” This effort has been largely focused on the capabilities of SMRs to supply power based on the fact that SMR output capacity and more flexible siting is a better match for DOD’s needs than traditional large light water reactors.

DOE believes SMRs, with their improvements in safety and security, would provide enhanced reliability and other benefits to large federal facilities by providing:

- Continued operations during widespread and extended loss of the grid (e.g., operation in “Island Mode” to continue supply to mission critical loads, and capability to “Black Start,” if necessary);
- Operational flexibility (e.g., provide load following capability and avoid scheduling all units off at the same time);
- Ability to provide power throughout an extended event that would disrupt fuel supply for a conventional power source (i.e., SMR has less frequent refueling requirements); and,
- Meeting reliability needs with clean energy and supporting carbon reduction directives.

The reliability of the power supplies to mission critical loads could be further enhanced by exploring the incorporation of robust transmission (e.g., armored transformers, underground transmission) and “Smart Grid” applications (use of features to de-energize non-essential loads while keeping mission-critical loads energized) into the site specific design requirements.

The potential of these enhanced reliability advantages leads DOE to encourage the Tennessee Valley Authority (TVA) to develop and pursue these features as a part of the Nuclear Regulatory Commission licensing process being pursued under the SMR LTS program. DOE encourages TVA to consider such features and capabilities for potential deployment in support of DOE facilities in Oak Ridge, Tennessee.

DOE requests that TVA explore and discuss the following specific features as part of its planning and licensing process:

1. Ability to continue to supply electricity to nearby offsite customers such as the neighboring DOE Oak Ridge complex (includes facilities at ORNL, Y-12 National Security Complex and possibly at the East Tennessee Technology Park) during a disruption to offsite power supplies, and
2. Transmission and distribution in a manner less vulnerable to intentional destructive acts and natural phenomena that could disrupt the power supply.

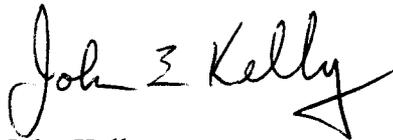
¹ ORNL Site Sustainability Plan with FY 2015 Performance Data, December 2015

The request to include these features in TVA's planning and licensing process should not be construed as a commitment of the Department to purchase such features or even to purchase the power produced by an SMR at the Clinch River Site.

By this letter, TVA is requested to provide DOE a plan for assessing impacts from, and pursuing the licensing of, these specified activities under the terms of the current Interagency Agreement established with the DOE Office of Nuclear Energy for our consideration. This work, and its potential demonstration with offsite customers, will serve as a "pilot" for other electricity-intensive federal facilities with enhanced reliability requirements. DOE will serve as point of contact for discussions with DOD on this matter, as appropriate.

If you have any questions regarding this request, please contact Tim Beville at 301-903-8251.

Sincerely,

A handwritten signature in black ink that reads "John E. Kelly". The signature is written in a cursive style with a large, stylized "J" and "K".

John Kelly
Deputy Assistant Secretary
for Nuclear Reactor Technologies

cc: Dave Czufin, TVA
Dan Stout, TVA
H. Randall Fair, DOE OSO
Teresa Robbins, NNSA Production Office
Jeff Smith, ORNL
Chris Robinson, Y-12
Tom Bergman, NuScale Power
Marc Nichol, NEI