



THE UNIVERSITY OF  
**TENNESSEE**  
KNOXVILLE

May 23, 2018

Document Control Desk  
Director, Office of Nuclear Material Safety and Safeguards  
Office of Nuclear Security and Incident Response  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Attn: Director, Office of Nuclear Material Safety and Safeguards

Subject: University of Tennessee Plans for Submitting a License to Possess and Use Special Nuclear Material (10 CFR Part 70)

This letter is a notice of intent for the University of Tennessee, Knoxville to submit a new license application to possess and use special nuclear material in the Engineering Services Building which will soon be under construction on the University of Tennessee campus in Knoxville, Tennessee and expected to open August 2021.


The University of Tennessee Nuclear Engineering (UTNE) Department is the second largest such program in the United States. We serve 349 students, including the largest PhD population of 132 students.

The University of Tennessee intends to use up to 2000 lbs of 9.75% enriched Uranium in an accelerator driven subcritical Fast Neutron Source (FNS) which would make this a Category III facility. The design will use a deuterium-deuterium (DD) neutron generator to drive a subcritical thermal/fast coupled pile. The fuel will be in metallic rods clad with Aluminum. The facility will operate at a Keff of 0.95 and produce negligible heat not requiring heat removal under any conditions.

We have been developing this FNS concept in conjunction with leaders and researchers at Oak Ridge National Laboratory (ORNL) and Idaho National Laboratory (INL) to meet a current national need. The nuclear reaction cross sections of many materials proposed

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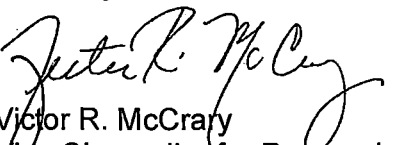
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for use in fast reactor applications are poorly understood and computational modeling & simulation of future nuclear systems is unreliable without accurate nuclear reaction data. To meet the national need of providing more accurate data, the FNS facility is being designed to facilitate both integral and differential cross section measurements. This research facility will produce data needed by fast reactor concept developers and is required to reduce uncertainties necessary to provide safe margins at reduced cost. Westinghouse, TerraPower, and several others have expressed need and interest in the data this facility will generate. Please note that the facility will not have high fluxes suitable for material damage experiments.

The facility design is not expected to be proprietary. We plan to conduct a safety audit, which will assess any safety and security risks prior to submitting our application. We expect to submit a license application during the summer of 2020.

Sincerely,



Victor R. McCrary  
Vice Chancellor for Research

cc: S. Patterson  
J. Zomchick  
C. Cimino  
W. Davis