

November 19, 2015

Mr. Daniel Stout, Senior Manager  
Small Modular Reactors  
Tennessee Valley Authority  
1101 Market Street  
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Chattanooga, TN 37402

SUBJECT: PRE-APPLICATION READINESS ASSESSMENT OBSERVATIONS ON THE  
DRAFT EARLY SITE PERMIT APPLICATION FOR THE CLINCH RIVER  
NUCLEAR SITE

Dear Mr. Stout:

The U.S. Nuclear Regulatory Commission (NRC), Office of New Reactors (NRO) and Office of Nuclear Security and Incident Response (NSIR) staff conducted a pre-application readiness assessment of the draft application and associated documentation for an early site permit (ESP) for the Clinch River Nuclear Site. This activity included a visit to the site on March 30 - 31, 2015, a visit to alternative sites on July 5 - 6, 2015, a readiness assessment of several safety review focus areas and the draft environmental report (ER) conducted at Tennessee Valley Authority (TVA) headquarters on August 3 - 6, 2015, and a readiness assessment of geotechnical and seismic materials at a contractor facility in Frederick, Maryland, on September 15 - 16, 2015. The NRC staff observations were made publically available through Agencywide Document Access and Management System (ADAMS) Accession Numbers ML15303A538 and ML15251A697. These observations are intended to inform TVA of applicable NRC requirements and guidance and to assist NRC preparations for the review once the application is submitted.

While TVA has made significant progress in the preparation of the ESP application, the NRC staff identified some aspects of TVA's preparations that could affect the application's readiness for docketing and the predictability of any review schedule. In order to conduct reviews on a predictable schedule, NRO has committed to a more rigorous acceptance review process. As such, greater consideration is being given to aspects of an application that could result in a review extending beyond a projected 30-month schedule that NRC budgets for ESP reviews. When these aspects are identified in an application, careful consideration is given whether that application should be docketed. The three specific aspects of the application that the NRC staff considers to have the most significant implications for the NRC's docketing decision and any resulting review schedule are as follows:

- Review of a 1-D site seismic response analysis for the proposed site is expected to take in excess of 30 months. The NRC staff has significant technical concerns regarding the use of a 1-D site response analysis for a site that is underlain by geologic strata with a 33 degree inclination. The application should provide additional justification supporting the adequacy of a 1-D approach for the proposed site, including a 2-D sensitivity analysis.

- The NRC staff has significant technical concerns regarding the use of a ground motion response spectrum (GMRS) that includes damping assumptions inconsistent with available site data, and that relies on guidance and an approach for characterizing uncertainty developed to support site response analysis where limited data is available (i.e., an approach developed for operating reactor Fukushima Near Term Task Force (NTTF) Recommendation 2.1). Such an approach could present serious concerns about the acceptability of the application for docketing, and any technical review of such an approach would be expected to take in excess of 30 months. The application should include sufficient justification for key site response parameters such as layer thickness, shear wave velocity, low strain damping, potential nonlinear behavior, as well as the uncertainty in these parameters.
- TVA contemplates proposing two (alternative) sets of emergency plans, each involving reduced emergency planning zones (EPZ) for a first-of-a-kind small modular reactor review. Especially considering the resulting need to prepare distinct safety evaluations for each proposed emergency plan option, this novel approach could complicate and lengthen the review. With respect to emergency planning, the NRC staff's pre-application readiness assessment also identified the need for better clarity on the basis for the source term envelope.

The NRC staff understands that, as TVA indicated during these assessments, further work is continuing on the draft application materials, which were incomplete at the time of the assessment. While the issues with the most significant implications for the NRC's docketing decision and the review schedule are summarized above, a comprehensive summary of NRC staff observations is available in the publically-available documents identified above. Once the draft application is closer to completion, TVA may wish to consider additional pre-application interactions with NRC staff, especially on the first two noted topics above.

Mr. Allen Fetter, Senior Project Manager, NRO, Environmental Projects Branch, is the point of contact for issues associated with the site safety review. Mr. Fetter may be reached at 301-415-8556, or [Allen.Fetter@nrc.gov](mailto:Allen.Fetter@nrc.gov). Ms. Tamsen Dozier, Project Manager, in the NRO Environmental Projects Branch, is the point of contact for issues associated with the site environmental review. Ms. Dozier may be reached at 301-415-2272, or [Tamsen.Dozier@nrc.gov](mailto:Tamsen.Dozier@nrc.gov).

Sincerely,

*/RA/*

Frank Akstulewicz, Director  
Division of New Reactor Licensing  
Office of New Reactors

Project No.: PROJ0785

cc: See next page

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Frank Akstulewicz, Director  
 Division of New Reactor Licensing  
 Office of New Reactors

Project No.: PROJ0785

Enclosures:

As stated

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