

November 19, 2015

MEMORANDUM TO: Jennifer Dixon-Herrity, Chief
Environmental Projects Branch
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Office of New Reactors

FROM: Allen Fetter, Senior Project Manager */RA/*
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SUBJECT: PRE-APPLICATION READINESS ASSESSMENT OBSERVATIONS ON
THE TENNESSEE VALLEY AUTHORITY'S DRAFT EARLY SITE PERMIT
APPLICATION FOR THE CLINCH RIVER NUCLEAR SITE

On August 3 – 5, 2015, U.S. Nuclear Regulatory Commission (NRC) staff from the Office of New Reactors (NRO) and the Office of Nuclear Security and Incident Response (NSIR) conducted a pre-application readiness assessment of the draft application and associated documentation that the Tennessee Valley Authority (TVA) plans to submit for an early site permit (ESP) for the Clinch River Nuclear Site. This activity took place at TVA offices in Knoxville, Tennessee. On September 15 – 16, 2015, additional NRC staff from NRO conducted a readiness assessment of other pre-application materials at Bechtel Offices in Frederick, Maryland. The enclosed report provides a synopsis of staff observations shared with TVA during this readiness assessment conducted over both timeframes. 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.

The subject matter areas focused on during the August 3 – 5, 2015, readiness assessment included:

- Meteorology (NUREG-0800, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition (SRP) Section 2.3.1 – 2.3.5)
- Hydrology (SRP Section 2.4.1 – 2.4.14)
- Normal operations radiological effluent release doses (SRP Section 11)
- Emergency Planning (SRP Section 13.3)
- Plant parameter envelope (PPE) source terms for design basis accident siting analysis (SRP Section 15)

The subject matter areas focused on during the September 15 – 16, 2015, readiness assessment included:

- Geologic characterization information (SRP Section 2.5.1)
- Vibratory ground motion (SRP Section 2.5.2)
- Surface deformation (SRP Section 2.5.3)
- Geologic cross-sections, slope stability and other subsurface information (SRP Section 2.5.4)

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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.

While the issues with the most significant implications for the NRC's docketing decision and the review schedule are summarized above, Enclosure 1 includes more detailed NRC staff observations resulting from the readiness assessments. TVA indicated during these assessments that further work is continuing on the draft application materials, which were incomplete at the time of the assessments. 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.

The NRC staff's pre-application readiness assessment plan, which was used as a planning document for the readiness assessment interactions, can be found in Agencywide Documents Access and Management System (ADAMS) under Accession No. ML15190A225. Enclosure 1 is a summary of the NRC staff's observations identified during the readiness assessment activities. Enclosure 2 presents the agendas outlining the topics described above and Enclosure 3 is a list of participants from each visit.

Project No.: PROJ0785

Enclosures: As stated

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ADAMS ACCESSION NUMBERS:

Package: ML15303A538

Memo: ML15303A480

Detailed Readiness Assessment Observations: ML15306A098 (Enclosure 1)

Readiness Assessment Agendas: ML15306A576 (Enclosure 2)

Readiness Assessment Attendees List: ML15306A585 (Enclosure 3)

NRO-002

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DATE	11/04/2015	11/04/2015	11/6/2015	11/9/2015
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DATE	11/10/2015	11/10/2015	11/9/2015	11/10/2015
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(Revised 06/03/2014)

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