



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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October 27, 2022

Mr. Brian McDermott, Director,
Licensing and Planning
New Nuclear Program
Tennessee Valley Authority
1101 Market Street
LP 1G-C
Chattanooga, TN 37402

SUBJECT: PRE-APPLICATION READINESS ASSESSMENT ACTIVITIES AND AUDIT
PLAN FOR THE CLINCH RIVER NUCLEAR SITE DRAFT APPLICATION

Dear Mr. McDermott:

The Tennessee Valley Authority (TVA) requested initiation of pre-application interactions with the Nuclear Regulatory Commission (NRC) by letter dated February 23, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22055A738) in support of a potential construction permit application for a BWRX-300 reactor at the Clinch River Nuclear (CRN) Site. Pre-application interactions to support development of an application for submission to NRC can involve discussion of technical and regulatory issues during public meetings as well as examination of preliminary application information during regulatory audits conducted by NRC. Audits of preliminary application information may be conducted using an applicant's electronic reading room as well as at a physical location controlled by an applicant. Lastly, NRC staff may interact with other Federal, state, county, and Tribal governments as part of its pre-application interactions and preparations. TVA may be requested to support some of these interactions.

The NRC's audit process is part of the NRC's official pre-application review process. The audit of the CRN Site draft application will allow the NRC staff to view its contents (in a read-only manner) and the level of detail in the draft application and identify any major issues or information gaps between the draft application and the technical content required to be included in the application submitted to the NRC. Therefore, the observations from these audits will inform the documents being prepared but will not predetermine whether the document and/or the application will be docketed.

The attached pre-application audit plan provides the details and logistics for the pre-application audit activities.

If you have any questions regarding this matter, please contact Mr. Allen Fetter, Senior Project Manager, at (301) 415-8556 or Allen.Fetter@nrc.gov.

Sincerely,

/RA/

Michael I. Dudek, Chief
New Reactor Licensing Branch
Division of New and Renewed Licenses
Office of Nuclear Reactor Regulation

Docket No.: 99902056

Enclosure:
Pre-application Audit Plan

cc: Raymond J. Schiele

SUBJECT: PRE-APPLICATION READINESS ASSESSMENT ACTIVITIES AND AUDIT PLAN FOR THE CLINCH RIVER NUCLEAR SITE DRAFT APPLICATION, DATED: OCTOBER 27, 2022

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***via email**

NRR-106

OFFICE	NRR/DNRL/NRLB: PM	NRR/DNRL/NRLB:LA	NRR/DNRL/NRLB: BC
NAME	AFetter*	SCGreen*	MDudek*
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**PRE-APPLICATION AUDIT PLAN OF THE CLINCH RIVER NUCLEAR SITE
DRAFT APPLICATION
October 2022
Docket No. 99902056**

PROCESS and LOCATION

The audit process will include a review of material on the Tennessee Valley Authority's (TVA's) online reference portal (also known as the Electronic Reading Room or eRR) in a read-only manner and will help inform any associated discussions during audits (either in-person or virtual) at locations to be determined or, during site visits at the Clinch River Nuclear (CRN) Site in Oak Ridge, TN as appropriate.

PURPOSE

The Tennessee Valley Authority (TVA) has voluntarily agreed to engage with the U.S. Nuclear Regulatory Commission (NRC) staff in a preapplication audit for the draft CRN Site Construction Permit Application (CPA) before the application is submitted for a formal NRC review.

The audit will allow the NRC staff to:

- View documents in TVA's eRR to identify information gaps between the draft application and the technical content required in the application submitted to the NRC,
- View documents in TVA's eRR to identify major technical or policy issues that may adversely impact the docketing or technical review of the application, and
- View documents in TVA's eRR to become more familiar with the application, particularly in areas where TVA is proposing new concepts or novel design features.

The observations from the audit will inform TVA in finalizing the application and assist the NRC staff in planning NRC resources in preparation for the formal application.

BACKGROUND

The TVA began pre-application planning discussions with the NRC staff on their preparation for the CRN Site during May 2022. In April 2022, TVA announced a partnership with Ontario Power Generation which has also selected BWRX-300 for deployment in Canada to support future development of the BWRX-300 on the CRN Site. As discussed in public meetings held on June 30, 2022, and July 5, 2022, TVA plans to submit an application for a construction permit (CP), including a Preliminary Safety Analysis Report (PSAR) and an Environmental Report (ER).

The NRC will conduct the audit of the draft PSAR, ER and associated information using TVA's Electronic eRR, and will share observations during virtual audits or site visits until the CPA is submitted.

SCOPE OF THE AUDIT

The NRC staff will use NRC’s Office Instruction LIC-111 “Regulatory Audits” (ML19226A274), as guidance for conducting this audit. In addition, the NRC staff will use appropriate portions of LIC-116, “Pre-application Readiness Assessment” (ML20104B698) and “Pre-application Engagement to Optimize Advanced Reactors Application Reviews: Draft Report” in its other pre-application interactions with TVA (ML21145A106).

This audit will cover all the chapters of the PSAR and ER including appendices. Associated appendices are anticipated to cover topics such as the emergency plan, the quality assurance plan, environmental consultations, and the environmental permitting and authorizations. The audit will also include a review of technical reports on reactor design, transient evaluation model and severe accident mitigation alternatives evaluations, as applicable. The audit of TVA’s draft application could cover the draft PSAR Chapters 1 through 19, and draft ER Chapters 1 through 10 and related information.

INFORMATION AND OTHER MATERIAL NECESSARY FOR THE PRE-APPLICATION AUDIT

The staff discussed with TVA what is needed for the audit. The following is needed to support the audit: PSAR Chapters 1 through 19 and Chapters 1 through 10 of the ER of the draft application, all available supporting topical reports, all major supporting technical reports, examples of important calculations, and staff who can answer questions related to these documents. The tables below list the technical review areas for the PSAR and the ER Audit Teams, respectively

AUDIT TEAMS

Preliminary Safety Analysis Report Review	
Area	Staff
Chapter 1, Introduction and General Description of Plant	Allen Fetter and Jordan Glisan
Chapter 2, Site Characteristics and Site Parameters	Jenise Thompson, Kevin Quinlan, Yuan Cheng, Zuhan Xi, supported by other technical staff
Chapter 3, Design of Structures, Components, Equipment, and System	Henry Wagage, supported by other technical staff
Chapter 4, Reactor	Shanlai Lu, supported by other technical staff
Chapter 5, Reactor Coolant System and Connected Systems	Shanlai Lu, supported by other technical staff
Chapter 6, Engineered Safety Features	Shanlai Lu, supported by other technical staff

Chapter 7, Instrumentation and Controls	Calvin Cheung, supported by other technical staff
Chapter 8, Electric Power	Sheila Ray, Vijay Goel, supported by other technical staff
Chapter 9, Auxiliary Systems	Shanlai Lu, supported by other technical staff
Chapter 10, Steam and Power Conversion System	Henry Wagage, supported by other technical staff
Chapter 11, Radioactive Waste Management	Zach Gran, Henry Wagage supported by other technical staff
Chapter 12, Radiation Protection	Ed Stutzcage, supported by other technical staff
Chapter 13, Conduct of Operations	Brian Green
Chapter 14, Initial Test Program	Tom Scarbrough and Renee Li, supported by other technical staff
Chapter 15, Transient and Accident Analyses	Elijah Dickson, supported by other technical staff
Chapter 16, Technical Specifications	Craig Harbuck, supported by other technical staff
Chapter 17, Quality Assurance	Deanna Zhang, supported by other technical staff
Chapter 18, Human Factors Engineering (Planned for OL application FSAR)	Brian Green, supported by other technical staff (may be addressed in the FSAR for an operating license application)
Chapter 19, Probabilistic Risk Assessment and Severe Accident Evaluation (Planned for OL application FSAR)	TBD, supported by other technical staff (may be addressed in the FSAR for an operating license application)

Environmental Report Review	
Area	Staff
Chapter 2, Proposed Site and Affected Environment	Peyton Doub, Joe Giacinto, Laura Willingham, supported by technical staff, as needed
Chapter 3, Plant Project Description	Laura Willingham, Joe Giacinto supported by technical staff, as needed
Chapter 4, Environmental Impacts of Plant Construction	Peyton Doub, Dan Mussatti, Laura Willingham, Joe Giacinto, Brian Glowacki
Chapter 5, Environmental Impacts of Station Operation	Peyton Doub, Joe Giacinto, Laura Willingham, Joe Giacinto, Don Palmrose, Brian Glowacki
Chapter 6, Fuel Cycle, Transportation, and Decommissioning Impacts Chapter 7, Cumulative Impacts Chapter 8, Need for Power Chapter 9, Alternatives for the Proposed Action Chapter 10, Environmental Consequences of the Proposed Action	Don Palmrose, Dan Mussatti, Laura Willingham, Joe Giacinto, Peyton Doub, Brian Glowacki

LOGISTICS

The audit will be conducted in a number of phases and will involve examination of documents and materials via TVA's eRR and may could include visits to the CRN Site or TVA facilities. The initial audit planning and engagement with TVA began on July 25, 2022, with a virtual entrance meeting, following the posting of the annotated Environmental Report chapter outlines for the first phase in the eRR and will end with a virtual exit meeting at the conclusion of the last phase of pre-application. TVA will be briefed on the observations of the phase of the assessment upon completion of each phase. Weekly debriefings with TVA will be scheduled as needed and meeting summaries will be publicly available 30-days after the public meeting is held. Topical areas for discussion will be documented and made available prior to each meeting.

Review Approach

The TVA review and the audit will be a hybrid of the traditional pre-application interactions. This approach will utilize a scaled down number of reviewers: (1) having knowledge of the prior CRN Site review; (2) focusing primarily on the reactor technology and new and significant information for the site; and (3) will be guided/advised by an Interdisciplinary Review Team (IRT).

The Project Team will conduct a streamlined audit that includes the following considerations:

- A targeted and streamlined audit to be performed by the NRC staff,
- NRC will control phase and session attendance and will specify charging codes for technical reviewers,
- TVA has requested targeted engagement with NRC technical reviewers on the BWRX-300 technology, safety, and environmental reviews,
- NRC will implement the assessment generally in two-week phases on specified technical engagements (i.e., on chapters and/or topics),
- TVA will provide tailored presentations and discussions to technical staff,
- NRC will implement real-time problem/issue identification and documentation via SharePoint,
- NRC will integrate the IRT concept into assessment activities (i.e., IRT staff engages in each technical phase and will meet periodically to advise on needed adjustments),
- NRC will facilitate the IRT comprehensive learning of the BWRX-300 design to aid in their independent actions (risk assessment, assessment of issues, etc.) needed during each review phase, and
- NRC will streamline PM/technical staff evaluation of TVA's proposed design changes and approach to development of the PSAR and ER.
- NRC will target to complete the audit within one year. The technical reviewers will perform the review consistent with LIC-111. In conducting this audit, the staff will deviate from LIC-111 in the following ways:
 - As the technical staff perform their review during the phase, observations will be documented in SharePoint and discussed with their branch chief. As these observations are discussed with TVA during the phase, they will be considered draft.
 - By the end of the phase, all input into SharePoint will be considered final and will be discussed with TVA at the exit briefing for that phase. No formal memo from the technical staff's branch chiefs will be provided.

AUDIT OBSERVATIONS

The NRC will send the audit observations, including any identified technical concerns or major information gaps, to TVA in a publicly available report that will also summarize the scope of the audit activities. NRC Office Instruction LIC-111 (ML19226A274) delineates the timeline for the final report to be completed within 45 calendar days of completion of the audit. The Audit Team will endeavor to complete the final report within 45 days using the streamlined process described above. To protect the applicant's proprietary information, if needed, the staff will issue a proprietary version of the audit report. The staff's expectation is that TVA will consider the observations from the audit while finalizing the application and will reevaluate the application submission date based on its evaluation of the time to address the audit observations.