

July 17, 2015

Daniel Stout, Senior Manager  
Small Modular Reactors  
Tennessee Valley Authority  
1101 Market Street  
LP 1G-C  
Chattanooga, TN 37402

SUBJECT: CLINCH RIVER EARLY SITE PERMIT PRE-APPLICATION READINESS  
ASSESSMENT

Dear Mr. Stout:

The staff of the U.S. Nuclear Regulatory Commission (NRC) has determined through conversations with counterparts at the Tennessee Valley Authority (TVA) that the weeks of July 27, August 3, and September 14, 2015, are appropriate times to conduct a pre-application readiness assessment for the expected early site permit application for the Clinch River site. This readiness assessment will be conducted in accordance with NRO-REG-104, "Pre-application Readiness Assessment."<sup>1</sup> The assessment will examine selected safety and environmental issues in TVA's draft application and supporting documentation. The enclosed readiness assessment plan provides details and other information supporting the NRC staff's planned activities.

The readiness assessment does not conform to, nor is it part of, the NRC's official acceptance review process. The readiness assessment of the draft Clinch River application will allow the NRC staff to understand the level of detail and identify any major issues or information gaps between the draft application and the technical content expected to be included in the final application submitted to the NRC. Therefore, the observations from the readiness assessment do not predetermine whether the application will be docketed.

Joseph Williams, Senior Project Manager, in the Office of New Reactors (NRO), Advanced Reactor and Policy Branch, and Allen Fetter, Senior Project Manager, NRO, Environmental Projects Branch, are the points of contact for issues associated with the site safety review. Mr. Williams may be reached at 301-415-1470, or [joseph.williams@nrc.gov](mailto:joseph.williams@nrc.gov). Mr. Fetter may be reached at 301-415-8556, or [allen.fetter@nrc.gov](mailto:allen.fetter@nrc.gov).

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<sup>1</sup> Agencywide Documents Access and Management System Accession No. ML14079A197.

D. Stout

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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/**

Michael E. Mayfield, Director  
Division of Advanced Reactors and Rulemaking  
Office of New Reactors

Project No. 785

Enclosure:  
Pre-Application Readiness  
Assessment Plan

D. Stout

2

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OFFICE	NRO/SMRLB	NRO/DNRL	NRO/RHMB	NRO/RGS1	NRO/PPAC	NRO/SPRA
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DATE	07/09/15	07/16/15	07/10/15	07/13/15	07/15/15	07/16/15
OFFICE	NSIR/NRLB	NRO/SMRLB	NRO/DNRL	NRO/DSEA/ RENV	NRO/DARR	
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DATE	07/09/15	07/16/15	07/15/15	07/14/15	07/17/15	

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# PRE-APPLICATION READINESS ASSESSMENT PLAN FOR THE DRAFT APPLICATION

## CLINCH RIVER EARLY SITE PERMIT

JULY 27 – SEPTEMBER 18, 2015

### PROJECT 785

#### **PURPOSE**

The Tennessee Valley Authority (TVA) has stated it intends to submit an early site permit (ESP) application for the Clinch River site near Oak Ridge, Tennessee, in early 2016.<sup>1</sup> This pre-application readiness assessment (hereinafter “readiness assessment”) will examine selected sections of TVA’s draft application to identify gaps between the information in the draft application and the technical content in the final application needed for the NRC to conduct its review in a timely and efficient manner. The readiness assessment will also help the NRC staff to become familiar with the planned application, particularly for the emergency planning portion of the application. Observations from the readiness assessment can be used by TVA to finalize the application, and will assist NRC preparations for the review once the application is submitted. However, the readiness assessment does not conform to, nor is it part of, the NRC’s official acceptance review process. The readiness assessment of the draft Clinch River application will allow the NRC staff to understand the level of detail and identify any major issues or information gaps between the draft application and the technical content expected to be included in the final application submitted to the NRC. Therefore, the observations from the readiness assessment do not predetermine whether the application will be docketed. TVA will be made aware of the NRC staff’s observations and will have an opportunity to address potential deficiencies prior to submitting the ESP application.

#### **BACKGROUND**

Following the issuance of combined licenses for Vogtle Units 3 and 4, and V.C. Summer Units 2 and 3, the NRC initiated a lessons-learned review to identify potential enhancements to the licensing process under Title 10 of the *Code of Federal Regulations* (CFR), Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants,” that could contribute to more effective and efficient reviews of future applications. After extensive outreach to external and internal stakeholders, in April 2013, the NRC issued the “New Reactor Licensing Process Lessons Learned Report.”<sup>2</sup> This report identified the quality of applications as a significant contributor to overall project performance. The report identified readiness assessments as one of the means of enhancing the quality of applications.

In discussions between NRC staff and their counterparts at TVA, it has been agreed that a readiness assessment of the Clinch River ESP application will be conducted during the weeks of July 27, August 3, and September 14, 2015. The assessment will examine both the draft environmental report (ER) and the draft site safety analysis report (SSAR).

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<sup>1</sup> “TVA Response to NRC Regulatory Issue Summary 2015-07,” June 19, 2015, Agencywide Documents Access and Management System (ADAMS) Accession No. ML15173A472.

<sup>2</sup> ADAMS Accession No. ML13059A239.

As discussed below, starting week of July 27, NRC staff will examine documents using an electronic reading room established by TVA. During the week of August 3, NRC staff will examine documentation in TVA's offices in Knoxville, Tennessee. During the week of September 14, NRC staff will examine documentation in the offices of a TVA contractor, Bechtel Corporation, in Frederick, Maryland.

## **READINESS ASSESSMENT SCOPE**

The Clinch River ESP readiness assessment will examine components of TVA's draft SSAR, draft ER, and supporting documentation.

### **SSAR Readiness Assessment**

The Clinch River ESP SSAR readiness assessment will focus on topics identified as challenging review areas in previous ESP reviews. The assessment will also examine TVA's draft submittal proposing two emergency planning zones, one for the site boundary, and another for an approximately 2 mile radius.

Topics to be addressed by the SSAR assessment are given in Table 1, along with NRC staff who will participate in the readiness assessment for that topic. Table 1 is separated into two sections, indicating topics to be addressed and staff participation in separate portions of the assessment.

NRC staff conducting the readiness assessment will use experiences gained in previous reviews, along with guidance documents, such as NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," (SRP). However, as noted in discussions at a meeting on May 5, 2015,<sup>3</sup> the NRC has not yet determined acceptance criteria to review, or established application content criteria for exemptions supporting the first-of-a-kind small modular reactor reduced emergency planning zone. Therefore, NRC staff conducting the readiness assessment for that topic cannot draw upon prior experience or supporting infrastructure documentation. While the effectiveness of the emergency planning zone review may be constrained by these limitations, there is still substantial benefit in familiarizing the NRC staff with the content of the emergency planning proposals, facilitating more effective schedule and resource planning, and guidance development for reviewing this topic.

### **ER Readiness Assessment**

The ER assessment will be conducted by a team consisting of NRC environmental staff, their contractors from Pacific Northwest National Laboratory, and representatives of the U.S. Army Corps of Engineers (jointly referred to as the environmental review team). The assessment will focus on the staff's examination of a nearly complete ER. The staff is intending to examine material in all resource areas as outlined in NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Environmental Standard Review Plan" (ESRP). Table 2 provides the list of environmental resource areas, the related ER sections, and the assessment team members for those topics. While most of the review team will examine

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<sup>3</sup> "Summary of May 5, 2015, Public Meeting With the Tennessee Valley Authority Regarding Emergency Planning Zone Exemptions," May 27, 2015, ADAMS Accession No. ML15141A145.

their assigned ER sections via the electronic reading room, participation in the document examination at TVA offices and the question/answer sessions will be limited to those team members listed in the far right column of the table.

In its examination of TVA's ER, the review team will use the ESRP as updated by interim staff guidance Interim Staff Guidance (ISG)-26, "Environmental Issues Associated with New Reactors" and ISG-27, "Specific Environmental Guidance for Light Water Small Modular Reactor Reviews." The review team will also draw from experiences gained in previous reviews. A sufficient application will include the site's baseline environmental information along with impacts from construction, impacts from operation, and cumulative impacts in each resource area. The application should provide a sufficiently complete description of the project and adequate plant parameter envelope information. It is expected that the ER will meet the ESRP standard for an analysis of alternative sites, including an adequate site selection process.

## **INFORMATION AND OTHER MATERIALS NECESSARY FOR THE READINESS ASSESSMENT**

As previously discussed with TVA, the following should be available to support the readiness assessment: full copies of the draft application, all supporting topical reports, all major supporting technical reports, examples of important calculations, and staff that can answer questions related to these documents.

For geologic maps, geologic and geotechnical cross sections, and any other illustrations used to support conclusions made by the TVA related to suitability of geologic, seismic, and geotechnical engineering site characteristics, the illustrations should be at a scale and resolution that renders them fully readable to enable staff to efficiently perform the readiness assessment.

## **SCHEDULE**

The readiness assessment will begin during the week of July 27, 2015, in NRC Headquarters in Rockville, Maryland. NRC staff will examine documents made available in an electronic reading room established by TVA regarding the topics in Table 1A and Table 2. NRC staff will provide information requests and initial feedback to the safety and environmental project managers. The project managers will relay this information to TVA by the close of business on July 30, 2015, to provide an opportunity for TVA to gather any additional information and prepare for direct discussions with NRC technical experts.

NRC staff conducting assessment of portions of the draft SSAR as listed in Table 1A will travel to TVA's offices in Knoxville, Tennessee on August 3, 2015, to conduct additional document examinations and discussions with cognizant TVA staff. An entrance meeting will be conducted upon arrival. An exit meeting to discuss preliminary observations regarding draft SSAR sections examined will be conducted the afternoon of August 5, 2015.

The environmental review team assessing the draft ER will travel to TVA's Knoxville offices on Wednesday, August 5, 2015, and will conduct an entrance meeting on arrival. The environmental exit meeting will be conducted on the afternoon of Thursday, August 6, 2015.

NRC staff assessing other portions of the draft SSAR as listed in Table 1B will examine documents in the electronic reading room starting as soon as the week of July 27, 2015. NRC

staff will provide information requests and initial feedback to the safety project manager, who will relay this information to TVA by the close of business on September 3, 2015, providing an opportunity for TVA to gather any additional information and prepare for direct discussions with NRC technical experts. Subsequently, staff will travel to the offices of TVA's contractor, Bechtel Corporation, in Frederick, Maryland on Tuesday, September 15, with an entrance meeting conducted upon arrival. An exit meeting addressing the topics in Table 1B will be conducted on Thursday, September 17.

## **DOCUMENT HANDLING PRECAUTIONS**

Any proprietary information in the electronic reading room or made available to NRC staff during the assessment must be clearly marked so that NRC staff can ensure appropriate handling of such materials.

This assessment is not addressing security or safeguards topics. Therefore, no information regarding those topics should be made available to NRC staff.

## **READINESS ASSESSMENT OBSERVATIONS**

The readiness assessment observations including any identified technical concerns or major information gaps will be provided to TVA in two publicly-available reports addressing the SSAR and ER assessments, respectively. The NRC staff expects TVA will consider the readiness assessment observations while finalizing the Clinch River ESP application.

Table 1A. Clinch River Site Safety Analysis Report Readiness Assessment Topics Knoxville, Tennessee, August 3-5, 2015		
<u>Topic</u>	<u>SRP Section</u>	<u>NRC Staff</u>
Meteorology	2.3	Jason White Kevin Quinlan
<ul style="list-style-type: none"> <li>• Hydrologic description</li> <li>• Floods</li> <li>• Probable maximum Flood (PMF) on streams and rivers</li> <li>• Potential dam failures</li> <li>• Probable maximum surge and seiche flooding</li> <li>• Probable maximum tsunami hazards</li> <li>• Ice effects</li> <li>• Cooling water canals and reservoirs</li> <li>• Channel diversions</li> <li>• Flooding protection requirements</li> <li>• Low water considerations</li> <li>• Groundwater</li> <li>• Accidental releases of radioactive liquid effluents in ground and surface waters</li> <li>• Technical specifications and emergency operation requirements</li> </ul>	2.4.1 – 2.4.14	Joseph Giacinto
Normal operations radiological effluent release doses	11	Donald Palmrose Richard Clement (via reading room)
Emergency Planning	13.3	<u>Emergency planning</u> Dan Barss Kenneth Thomas FEMA representative  <u>Risk Assessment</u> Jason Schaperow Mark Caruso (via reading room)  <u>Dose Assessment</u> Michelle Hart
Plant parameter envelope (PPE) source terms for design basis accident siting analysis	15	Michelle Hart



Table 1B. Clinch River Site Safety Analysis Report Readiness Assessment Topics Frederick, Maryland, September 15-17, 2015		
Geologic characterization information	2.5.1	Meralis Plaza-Toledo Gerry Stirewalt
Vibratory ground motion	2.5.2	Stephanie Devlin-Gill David Heeszel
Surface deformation	2.5.3	Meralis Plaza-Toledo Gerry Stirewalt
<ul style="list-style-type: none"> <li>• Geologic cross-sections and stratigraphic sections review</li> <li>• Shear wave velocity profiles</li> <li>• Subsurface material properties</li> <li>• Subsurface material uniformity evaluation</li> <li>• Foundation bearing capacity envelope</li> <li>• Slope stability analysis</li> <li>• Soil boring plan and logs</li> </ul>	2.5.4	Ricardo Rodriguez Weijun Wang

Table 2. Clinch River Environmental Report Readiness Assessment Topics Knoxville, Tennessee, August 5-6, 2015		
<u>Topic</u>	<u>ER Section</u>	<u>Environmental Review Team</u>
Site and Technical/Regulatory Overview	Chapter 1 Sections 2.0, 2.1, 2.8	Tamsen Dozier Bruce McDowell Mark McIntosh (USACE)
Project Description	Chapter 3	Nancy Kohn Lance Vail
Cumulative Impacts	Sections 4.7, 5.11, 9.3	Bruce McDowell
Alternatives	Chapter 9	Andrew Kugler Tom Anderson
Land Use and Transmission Lines	Sections 2.2, 2.8, 3.1, 3.7, 4.1, 5.1, 5.6 Land Use portions of 4.6, 4.7, 5.10, 5.11, 6.5 and 9.3	Dave Anderson
Terrestrial Ecology and Wetlands	Sections 2.4.1, 4.3.1 Ecological portions of 4.6, 4.7, 5.3, 5.6, 5.10, 5.11, 6.5 and 9.3	Jim Becker Peyton Doub (via phone)
Aquatic Ecology	Sections 2.4.2, 4.3.2, Ecological portions of 4.6, 4.7, 5.3, 5.6, 5.10, 5.11, 6.5 and 9.3	Nancy Kuntzleman
Hydrology	Sections 2.3, 3.3, 3.4, 4.2, 5.2, 5.3 Hydrology portions of 4.6, 4.7, 5.3, 5.6, 5.10, 5.11, 6.5, and 9.3	Lance Vail Dan Barnhurst
Socioeconomics and Environmental Justice	Sections 2.5, 4.4, 5.8 Socioeconomics portions of 4.6, 4.7, 5.10, 5.11 and 9.3	Dave Anderson Dan Mussatti (via phone)
Cultural/Archaeological	Sections 2.5.3, 4.1.3, 5.1.3 Historic Resources portions of 4.6, 4.7, 5.10, 5.11, and 9.3	Tara O'Neil
Air Quality and Meteorology	Sections 2.7, 6.4 Air quality portions of 4.6, 4.7, 5.10, 5.11, and 9.3	Bruce McDowell Jeremy Richel (via phone)
Non-radiological Human Health Non-radiological Waste	Sections 3.6, 6.6 Non-rad health/waste portions of 4.6, 4.7, 5.5, 5.10, 5.11, and 9.3	Tara O'Neil
Radiological Impacts	Section 3.1, 3.2, 3.5, 4.5, 5.4, 6.2 Radiological health/waste portions of 4.6, 4.7, 5.5, 5.10, 5.11, and 9.3 SSAR 11.2.3 and 11.3.3	Donald Palmrose Eva Hickey (via phone)
Fuel Cycle and Decommissioning	Sections 5.7, 5.9	Donald Palmrose Eva Hickey (via phone)
Accidents	Sections 7.1, 7.2 Postulated Accidents portions of 4.7, 5.11, and 9.3	Donald Palmrose Jason Schaperow Jeremy Richel (via phone)
Transportation of Radiological	Sections 3.8, 7.4, and related portions of 4.6, 4.7, 5.10, 5.11, and 9.3	Donald Palmrose Steve Maheras (via phone)