

May 27, 2015

MEMORANDUM TO: Mark Tonacci, Chief  
Small Modular Reactor Licensing Branch  
Division of Advanced Reactors and Rulemaking  
Office of New Reactors

FROM: Joseph F. Williams, Senior Project Manager */RA/*  
Small Modular Reactor Licensing Branch  
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SUBJECT: SUMMARY OF MAY 5, 2015, PUBLIC MEETING WITH THE  
TENNESSEE VALLEY AUTHORITY REGARDING EMERGENCY  
PLANNING ZONE EXEMPTIONS

On May 5, 2015, representatives of the Tennessee Valley Authority (TVA) met with staff from the U.S. Nuclear Regulatory Commission (NRC) in Rockville, Maryland to discuss exemptions supporting a reduced emergency planning zone (EPZ) as part of the planned Clinch River early site permit (ESP) application. Meeting attendees shown in Enclosure 1. Copies of presentation materials used by TVA may be found in the Agencywide Documents Access and Management System, Accession No. ML15141A122.

#### TVA Presentation

At the start of the meeting, NRC staff noted that a reduced EPZ for proposed small modular reactors (SMR) is a policy issue expected to require a Commission decision. The NRC staff offered its perspectives at the meeting in good faith, but noted that the eventual regulatory decision is dependent on the Commission's endorsement of a particular course of action. No regulatory decisions or commitments for action were made by the NRC during the meeting.

TVA representatives described plans to submit an ESP application in early 2016. TVA staff also noted that its presentation includes discussion similar to that provided at a meeting on December 17, 2014.<sup>1</sup> TVA described features of SMR's which it claims significantly reduce accident risks and offsite consequences. NRC has not yet validated these claims.

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<sup>1</sup> "Summary of Public Meeting with The Nuclear Energy Institute, the Tennessee Valley Authority Regarding Small Modular Reactor Emergency Planning Zones," March 11, 2015, ADAMS Accession No. ML15044A419.

The Clinch River site is adjacent to the Oak Ridge National Laboratory operated by the Department of Energy (DOE), and is about 12 miles from the city of Oak Ridge, Tennessee. TVA described DOE as an interested customer for electricity generated at the Clinch River site. TVA owns and controls the proposed reactor site.

TVA expects to propose two EPZs in the Clinch River ESP submittal. One zone would have a two mile radius, while the other would correspond to the site boundary. TVA acknowledged that this proposal is unusual. Other ESPs have proposed a single EPZ based on a conventional 10 mile radius, rather than two smaller EPZs.

The approach TVA plans to use for its proposal is generally consistent with a generic framework being developed by the Nuclear Energy Institute (NEI). The generic framework is intended to bound a variety of sites and SMR designs. The Clinch River proposal will be integrated with TVA's emergency response plans for its existing nuclear facilities, so certain aspects of the NEI framework, such as proposed alternatives for offsite emergency operations facilities, are not relevant to TVA. It is expected that the NEI framework will be provided after NRC issues a pending Commission paper regarding SMR EPZ sizing.

TVA described their planned approach. Protective action guidelines established by the Environmental Protection Agency are the basis for the proposed dose criteria. At the EPZ boundary, design basis event consequences will not exceed 1 roentgen equivalent man (REM) total effective dose equivalent. TVA claims that for beyond design basis severe accidents, there will a very low probability of exceeding 1 REM at the EPZ boundary, and that there is high confidence that there will be at least 10 hours from the start of an accident until there is a release exceeding this dose limit. Total acute dose from severe accidents will be less than 200 REM.

In response to questions from NRC staff, TVA said that specific values for the conditional probability of dose exceedance are not yet available. NRC staff noted that the methodologies used in the various calculations need to be addressed in the application. For example, it will be necessary to specify how a probabilistic risk assessment will be conducted in order to determine the capability of a particular design to demonstrate a sufficiently low severe accident probability. Similarly, methods for dose calculations and demonstration of sufficiently slow accident progression need to be specified.

Meeting participants also discussed the role of the plant parameter envelope which will define characteristics of a reactor which could be constructed at the site. The discussion illustrated the need for discussion of the application content and standards to be applied in the NRC's review.

The role of the NEI generic framework was also discussed. TVA said that the framework will address the 16 planning standards described in NRC's emergency planning regulations. NRC staff noted that a mechanism for NRC's review or possible endorsement of the NEI framework has not yet been identified. TVA said that they believe there is additional risk associated with their ESP application if NRC has not approved the NEI approach. NRC staff noted that a specific regulatory product associated with the NEI framework has not been requested, so meeting participants discussed options for obtaining the clarity TVA seeks.

TVA outlined the bases it believes supports the criteria being proposed. TVA stated that NRC has found that 10 hours provides a reasonable amount of time to implement off-site protective actions in recent emergency planning exemptions for reactors undergoing decommissioning. NRC staff noted that this topic may be addressed as part of the pending decommissioning rule making effort, so it is possible a different standard may be identified for generic usage. NRC staff noted that there are some distinctions between SMRs and decommissioning plants, such as the presence of radioactive iodine isotopes which are not present at decommissioning facilities. TVA stated that, depending on the design, SMRs may provide more than 10 hours to implement protective actions before off-site doses are projected to exceed the PAGs.

TVA stated it will work with the Tennessee Emergency Management Agency (TEMA) to develop a multi-jurisdictional radiological emergency response plan. This plan will support the existing Tennessee Emergency Management Plan which addresses a broad spectrum of hazards, not just radiological hazards.

The plan TVA will submit with its ESP application is characterized as a “major features” plan, consistent with requirements given in Title 10 *Code of Federal Regulations* (10 CFR) 52.17(b)(2)(i). Such a proposal leaves some topics to be addressed in other 10 CFR Part 52 licensing processes, such as a certification of a reactor design or a subsequent combined license application. On-shift staffing is one of the topics which will not be fully addressed in the ESP application. NRC staff asked if TVA will address staffing issues arising out of the March 11, 2011, Fukushima accident. TVA responded that NEI guidance addressing staffing issues will be addressed in its application.

TVA noted that both EPZ proposals fall entirely within Roane County, Tennessee, and that TEMA is aware of TVA’s intent to submit these plans in the ESP application. TEMA representatives monitored this meeting, and provided some perspectives, as discussed below.

TVA provided an overview of regulatory exemptions it expects to request as part of its ESP application, stating that the exemptions will be consistent with the pending NEI emergency planning framework. TVA’s presentation provided a sample of the exemptions it expects to request, and stated that the full set of proposed changes will be made available for audit by the NRC staff prior to submittal of its application. NRC staff noted some challenges associated with an audit. Typically, pre-application audits is intended to assess the readiness of a prospective applicants submittal, comparing the set of available information to NRC’s application content requirements (i.e., reactor siting information described Regulatory Guide 1.206, “Combined License Applications for Nuclear Power Plants (LWR Edition)”) and staff review guidance in NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition.” However, the NRC staff has not yet developed either application or review guidance for a reduced EPZ submittal, so parameters for an audit cannot be specified as thoroughly as for other topics where such guidance is readily available. NRC staff will also need to be mindful that emergency planning is a topic of considerable interest to industry and public stakeholders, so an audit needs to be well-documented to ensure NRC’s interactions with TVA are conducted in a transparent manner.

TVA stated that it expects to propose that exemptions are justified per the provisions of 10 CFR 50.12(a)(2)(ii), which states that an exemption can be granted if it is determined that “Application of the regulation in the particular circumstances would not serve the underlying

purpose of the rule or is not necessary to achieve the underlying purpose of the rule.” TVA’s exemption proposal is also expected to reference 10 CFR 50.12(a)(2)(iii), which states that an exemption can be granted if “Compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated.”

TVA’s presentation described eight line-item examples of proposed exemptions that it said are characteristic of a broader set. TVA stated that there are many more affected line-items, as many as “hundreds.” Affected regulations include portions of 10 CFR 50.33, 10 CFR 50.47, and Appendix E of 10 CFR Part 50. TVA noted that some exemption requests will apply to both EPZ proposals, while others apply only to a single EPZ proposal.

At the conclusion of TVA’s presentation, NRC staff noted that ongoing regulatory activities may affect TVA’s plans. Aside from the necessary Commission decisions regarding SMR EPZs discussed above, the NRC staff noted that rule making activities associated with the agency’s response to the March 11, 2011, Fukushima accident and pending revisions to NUREG-0654, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants (FEMA-REP-1),” could also affect review of the proposed exemptions.

#### Public Interaction

After concluding its discussion with TVA, NRC staff provided an opportunity for public interaction.

A representative of TEMA shared several observations with NRC staff. He indicated that TEMA is interested in understanding how NRC will address the impact of multi-unit operations and events. NRC staff noted that this topic has been identified as an issue which needs to be considered, especially for SMR facilities where as many as 12 separate reactors may be operating. The TEMA representative also asked NRC to address the effects of accidents affecting site spent fuel pools. NRC said that such events will be considered in the evaluation of TVA’s proposal.

The TEMA representative stated that the Clinch River site is in an active earthquake zone. NRC staff said that the site review will confirm whether or not the seismic characteristics are acceptable, in accordance with NRC’s regulations.

The TEMA representative noted that the site is within a 5 mile emergency zone around the Oak Ridge National Laboratory. NRC staff indicated that there is some precedent for addressing such situations, noting that about half of the EPZ for the Vogtle site covers the Savannah River Site operated by the DOE. Staff said that the Vogtle licensee and DOE have a letter of agreement regarding emergency planning for this site.

The TEMA representative indicated that a site boundary EPZ could provide a precedent for postulated metropolitan reactor siting. NRC staff said that such sites would probably not be viable for other considerations, such as environmental issues.

The TEMA representative noted that it is anticipated that a multi-jurisdictional emergency response plan will be developed for the Clinch River site. It is expected that NRC and the Federal Emergency Management Agency will work with TEMA as this plan is developed.

In response to a question from the NRC staff, TVA stated that offsite plans will not be submitted with the ESP application. The application is expected to include letters from organizations such as TEMA documenting their intent to participate in developing those plans.

The TEMA representative said that the State of Tennessee is supportive of the project.

A member of the public requested that NRC's review effort include consideration of any hazard associated with spent fuel storage at the site. NRC staff indicated that hazard is included in its review.

This member of the public also stated that it is his understanding that NRC will address lessons learned from the March 11, 2011, Fukushima accident regarding the direction of a plume of radiological material released from the site.

The member of the public asked if the NEI framework TVA described is publicly available. NRC staff said that NEI has not yet provided the framework to NRC.

The member of the public stated that he perceives a conflict between the intent of NEI's framework, characterizing NEI as supportive of the nuclear industry versus public health and safety. He stated intent to closely scrutinize the NEI and TVA proposals.

Project No.: PROJ0785

Enclosure:

Attendees

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Enclosure:

Attendees

**Distribution:**

See next page

**ADAMS ACCESSION No.: ML15141A145**

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<b>DATE</b>	05/26/2015	05/27/2015

**OFFICIAL RECORD COPY**

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VALLEY AUTHORITY REGARDING EMERGENCY PLANNING ZONE  
EXEMPTIONS

**Distribution:**

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Attendees  
 Clinch River Early Site Permit Pre-application  
 Exemptions Supporting a Reduced Emergency Planning Zone  
 May 5, 2015

<u>Name</u>	<u>Affiliation</u>
Steve Schilthelm	Babcock and Wilcox
Steve Kline	Bechtel
Garry Morgan	Blue Ridge Environmental Defense League Bellefonte Efficiency and Sustainability Team Mothers Against Tennessee River Radiation
Williams Stokes	Columbia Basin Consulting Group
David Daigle	ENERCON
Paul Ouellette	Engineering, Planning, and Management, Inc.
Gregory Richardson	Engineering, Planning, and Management, Inc.
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Mark Beaumont	Holtec
James Kinsey	Idaho National Laboratory
Dan Barss	Nuclear Regulatory Commission
Tami Dozier	Nuclear Regulatory Commission
Michelle Hart	Nuclear Regulatory Commission
Mike Jones	Nuclear Regulatory Commission
Patricia Milligan	Nuclear Regulatory Commission
Demetrius Murray	Nuclear Regulatory Commission
Bruce Musico	Nuclear Regulatory Commission
Donald Palmrose	Nuclear Regulatory Commission
John Pelchat	Nuclear Regulatory Commission
Alison Rivera	Nuclear Regulatory Commission
Kenny Thomas	Nuclear Regulatory Commission
Mark Tonacci	Nuclear Regulatory Commission
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Cyrus Afshar	NuScale
Tom Bergman	NuScale
Gary Mays	Oak Ridge National Laboratory
Frances Hilderman	Saskatchewan Power
Tom Clements	Savannah River Watch
David Green	Tennessee Emergency Management Agency
Tim Holden	Tennessee Emergency Management Agency
Jerry Bingaman	Tennessee Radiological Health
Ruben Crosslin	Tennessee Radiological Health
Andrew Holcomb	Tennessee Radiological Health

Enclosure



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Peter Hastings	Tennessee Valley Authority
Walter Justice	Tennessee Valley Authority
Walter Lee	Tennessee Valley Authority
Paul Lundy	Tennessee Valley Authority
Blake Nelson	Tennessee Valley Authority
Jeff Perry	Tennessee Valley Authority
Dan Stout	Tennessee Valley Authority
John Thomas	Tennessee Valley Authority
Rob Sisk	Westinghouse