Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402-2801

June 14, 2013

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

10 CFR Part 50

In the Matter of)
Tennessee Valley Authority)

Project Number 785

Dear Sir or Madam:

TENNESSEE VALLEY AUTHORITY (TVA) - REVISION TO THE KEY ASSUMPTIONS LETTER FOR THE POSSIBLE LICENSING AND CONSTRUCTION OF SMALL MODULAR REACTOR MODULES AT THE CLINCH RIVER SITE

References
1) TVA's letter to NRC dated December 22, 2010, "Addendum to the Key Assumptions Letter For The Possible Licensing And Construction Of Small Modular Reactor Modules At The Clinch River Site"

2) TVA's letter to NRC dated February 11, 2013, "Tennessee Valley Authority (TVA) Clinch River Construction Permit (CRCP) Project Voluntary Response to RIS 2012-12"

3) NRC's letter to Daniel P. Stout and Jeffrey A. Halfinger dated April 9, 2013, "Responses to Regulatory Issue Summary 2012-12 and Coordination of U.S. Nuclear Regulatory Commission Review of Planned Construction Permit and Design Certification Applications"

In Reference 1, TVA provided the NRC Staff with information and clarifications regarding TVA's key licensing assumptions underlying the possible licensing and construction of Babcock & Wilcox (B&W) mPower™ design small modular reactors (SMR) at TVA's Clinch River site in Oak Ridge, Tennessee. When these key assumptions were initially developed, TVA anticipated that the Design Certification Application (DCA) would be submitted after the Construction Permit Application (CPA) (together, "the applications"). In Reference 2, TVA stated the current schedule has the DCA being submitted before the CPA. As a result, TVA was asked in Reference 3 to reassess its Key Assumptions and provide an updated discussion of whether/how those assumptions may have been affected by the revised sequence of the applications.

The purpose of this letter is to update, as appropriate, the six previously submitted Key Assumptions as a result of the revised sequence of the applications. Accordingly, each

D104
NRD

of the Key Licensing Assumptions discussed in Reference 1 are repeated verbatim in this letter followed by TVA's updated discussion reflecting the revised sequence of the submittals. In addition, the One Design - One Review process that was more fully described in Enclosure 2 of Reference 1 has also been updated to address the impacts from changing the sequence of the applications.

Key Licensing Assumptions

The application for Construction Permits supporting the deployment of the mPower modules would be prepared in accordance with the content requirements of 10 CFR 50.33, 50.34 and 10 CFR 50.34a. The Part 50 process would allow for the effective and systematic development of project licensing, design finalization and construction. TVA believes that the use of the Part 50 process provides the flexibility necessary to support potential design modifications identified during construction as well as inform future deployments. Therefore, use of the Part 50 licensing process is TVA's ***first key assumption****.*

This Key Assumption is not affected by the revised submittal sequence of the applications. TVA has confirmed its intent to submit a CPA using the 10 CFR Part 50 process.

Regardless of whether the Part 50 or Part 52 process is used, TVA recognizes the need to maintain standardization at the Clinch River site. Lessons learned and design changes identified during the construction phase are expected to be factored into the standard mPower design.

The ***second key assumption*** *stems from the first. In accordance with the Part 50 process, TVA would develop a Preliminary Safety Analysis Report (PSAR). The PSAR would be prepared utilizing the guidance of Regulatory Guide 1.70, Revision 3, and the organizational structure of the Standard Review Plan (SRP). The PSAR would include an evaluation of the facility against the SRP revision in effect six months prior to submittal of the Construction Permit application. The application would include an environmental report addressing the Environmental Standard Review Plan (ESRP) guidance contained in NUREG 1555.*

This Key Assumption is not affected by the revised submittal sequence of the applications. TVA still intends to submit a PSAR utilizing the guidance of Regulatory Guide 1.70, Revision 3 and an Environmental Report addressing the guidance contained in NUREG 1555. TVA will continue to ensure the requirements of 10 CFR Part 50 are addressed in the PSAR. The requirements of 10 CFR Part 50 will also be addressed during the operating license application phase of the project.

TVA recognizes that information in addition to that defined in Regulatory Guide 1.70 will be available due to the development and submittal of the DCA prior to the CPA. TVA expects to include DCA information in the CPA where it will improve NRC review efficiency but not where additional information would be inappropriate for a CPA or unduly limit flexibility during construction. (An example of information from the DCA that may be inappropriate for inclusion in the CPA includes ITAAC information.) Detailed chapter level reviews are being performed to ensure alignment between B&W and TVA on the DCA information appropriate for inclusion in the CPA and the results of this review may be discussed in a future public meeting.

The NRC has issued B&W mPower draft Design Specific Review Standards (DSRS's) for industry review. It is NRC's intention that the DSRS sections will replace Standard Review Plan sections for the B&W mPower reactor design. TVA anticipates the DCA, and therefore the related CPA content, to be prepared using the DSRS guidance, where applicable.

TVA used its regulatory framework process to identify differences between 10 CFR Part 50 and 10 CFR Part 52 regulatory guidance. Also, the DCA will be prepared in accordance with the requirements of 10 CFR Part 52, Subpart B (Standard Design Certifications), including the content requirements of 10 CFR 52.46 and 52.47. Because the DCA is developed using Part 52 criteria and because TVA plans to include some DCA information in the CPA, some Part 52 requirements will also be addressed in the CPA. In summary, even though TVA will use the 10 CFR Part 50 guidance, some new regulations described in Part 52 will be addressed in the CPA.

TVA will submit an Environmental Report as Part 3 of its CPA to address the guidance contained in NUREG 1555. In accordance with its National Environmental Policy Act (NEPA) responsibilities, TVA will also develop an Environmental Impact Statement utilizing, in large part, the information contained in the Environmental Report.

For the first-of-class deployment at the Clinch River site, TVA will complete the severe accident management alternatives (SAMA) during development of the Environmental Report (Part 3 of the CPA) during the construction permit phase of the project. TVA and Generation mPower will continue to integrate risk insights into the design process and into plant operating procedures and training approaches as they are developed during the operating license application phase of the project.

Following the receipt of the NRC's draft Safety Evaluation Report for the PSAR, it is anticipated that a Design Certification Application (DCA) would be submitted to the NRC by Generation mPower, a B&W and Bechtel Corporation alliance. TVA proposes that through the NRC license review process, a "One Design - One Review" approach be adopted in anticipation of parallel Operating License submittals – TVA's Final Safety Analysis Report (OL-FSAR) as well as a Generation mPower DCA application. This is consistent with the concept of a design-centered review approach as described in

Regulatory Issue Summary 2006-06, "New Reactor Standardization Needed To Support the Design-Centered Licensing Review Approach." To the extent that the scope and content of the FSAR's design overlap with a DCA submittal, TVA anticipates that the NRC Staff would perform a single review of the generic content common to both the FSAR and DCA, consistent with the design-centered review approach. Based on the likelihood of parallel submittals, the ***third key assumption*** *is the utilization of a "One Design - One Review" approach.*

Although the timing of the submittal of the DCA and the CPA has been revised, TVA still proposes use of the "One Design - One Review" approach and anticipates that the NRC will perform a single review of the generic standard plant content common to both the PSAR and DCA consistent with the design centered review approach. A more detailed description of the principles and rationale behind the "One Design - One Review" approach is included in Enclosure 1 to this letter.

TVA recognizes that it is critical to maintain standardization. Lessons learned and design changes identified during the construction phase are expected to be factored into the operating license application. They will also be factored into the standard mPower design through standard departures to the Design Certification Document (DCD) (for subsequent COLA's) or through later revisions to the DCD. To facilitate the One Design - One Review approach for the FSAR, annotations would be used to identify the information already provided and reviewed in the DCA and the information that has changed.

In accordance with 10 CFR 50.31, Combining Applications, TVA would combine license applications for Part 30, 40, 50, and 70 licenses. This is consistent with the process currently being used for licensing new reactors and represents our ***fourth key assumption****.*

Per Reference 1, this key assumption has been withdrawn.

As described previously, TVA is evaluating the mPower technology for use at its Clinch River site. The mPower design makes substantial use of modular construction technology which enables major portions of the plant to be fabricated in controlled manufacturing environments and shipped to the site via rail and trucks. TVA plans to use B&W as a vendor in the development of the mPower modules. As a result of treating B&W as a vendor, the fabrication of major plant components may begin before the issuance of the Construction Permits and may require NRC inspection resources in advance of Construction Permit issuance. This will necessitate close coordination and timely communication of manufacturing plans and schedules to facilitate NRC Inspection activities. TVA's ***fifth key assumption is*** *that the NRC Staff would inspect B&W as a vendor.*

This Key Assumption is not affected by the revised sequence of the application submittals. TVA will continue to work with the NRC Staff to effectively implement the vendor inspection program for SMRs.

The initial test program would be developed using the guidance of Regulatory Guide 1.68, Revision 3, to assure that all Systems, Structures, and Components (SSCs) important to safety are tested to demonstrate that the facility can be operated in accordance with design requirements and in a manner that will not endanger the health and safety of the public. The scope of the inspection and enforcement program along with the initial test program that encompasses site preparation inspections, construction inspections, manufacturing inspections, and system tests through hot functional testing will inform the development and demonstrate successful execution of future ITAAC that may be specified in subsequent Design Certification or COL applications. This represents TVA's ***sixth key assumption****.*

Lessons learned during the testing and inspections from the Initial Test Programs will be used to inform and confirm the ITAAC developed by Generation mPower as part of the DCA. As discussed above with regard to changes identified during the construction phase, changes and lessons learned from the initial test program are expected to be factored into the standard design.

The key assumptions are important for communicating the rationale associated with TVA's licensing approach. TVA coordinated closely with Generation mPower and Babcock and Wilcox mPower while developing this letter. TVA, Generation mPower and Babcock and Wilcox mPower plan to jointly participate in the upcoming public meeting to discuss our approach to the SMR project at the Clinch River site. TVA appreciates the NRC Staff's engagement and facilitation of the public meeting.

TVA will keep the NRC Staff informed of ongoing licensing activities and looks forward to hearing the NRC staff's views and feedback. If you have any questions, please contact Pete Gaillard in Chattanooga, Tennessee, at (423) 751-2088 or by email at pcgaillard@tva.gov.

Sincerely,

Daniel P. Stout

Daniel P. Stout
Senior Manager
SMR Technology

Enclosure
cc: See page 6

cc (Enclosure):

Mr. R. W. Borchardt
U.S. Nuclear Regulatory Commission
One White Flint North, 16E15
11555 Rockville Pike
Rockville, Maryland 20852-2378

Mr. Stewart Magruder
U.S. Nuclear Regulatory Commission
Two White Flint North, 9 F27
11545 Rockville Pike
Rockville, Maryland 20852-2738

Mr. Michael Mayfield
U.S. Nuclear Regulatory Commission
Two White Flint North, 6 E4
11545 Rockville Pike
Rockville, Maryland 20852-2738

Mr. Mark Notich
U.S. Nuclear Regulatory Commission
Two White Flint North, 7 F27
11545 Rockville Pike
Rockville, Maryland 20852-2738

Mr. Joelle Starefos
U.S. Nuclear Regulatory Commission
Two White Flint North, 9 F27
11545 Rockville Pike
Rockville, Maryland 20852-2738

Mr. Glenn M. Tracy
U.S. Nuclear Regulatory Commission
Two White Flint North, 6 F15
11545 Rockville Pike
Rockville, Maryland 20852-2738

Mr. Joseph Williams
U.S. Nuclear Regulatory Commission
Two White Flint North, 6 E4
11545 Rockville Pike
Rockville, Maryland 20852-2738

ENCLOSURE 1
PRINCIPLES AND RATIONALE FOR THE ONE DESIGN - ONE REVIEW PROCESS

I. INTRODUCTION

This enclosure provides a more detailed discussion of how the "One Design - One Review" approach could be implemented with the review of a Design Certification Application (DCA) and an associated Construction Permit Application (CPA). The paper also describes how this approach is consistent with the Atomic Energy Act, NRC regulatory requirements, and NRC policy. In particular, this "One Design - One Review" approach would not modify any of the NRC's procedural review requirements and would not alter the standards for granting licenses or certifications. Instead, the approach would streamline these reviews and result in regulatory efficiency, consistency and increased standardization.

II. DESCRIPTION OF "ONE DESIGN - ONE REVIEW" APPROACH FOR THE mPOWER DESIGN

The NRC review of the mPower design could factor into multiple overlapping licensing reviews, including (1) Generation mPower's DCA for the mPower design; (2) TVA's CPA for the Clinch River site; and (3) TVA's operating license ("OL") application for the Clinch River site[1]. Each of these licensing reviews, and the corresponding use of the "One Design - One Review" approach, is discussed below.

Generation mPower Design Certification Application

Generation mPower intends to submit a DCA for the mPower design prior to submittal of TVA's CPA. The DCA is being prepared in accordance with the requirements of 10 CFR Part 52, Subpart B (Standard Design Certifications), including the content requirements of 10 CFR 52.46 and 52.47. The application also is being prepared utilizing the guidance of NUREG-0800, "*Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition*" ("Standard Review Plan") and informed by the B&W mPower draft Design Specific Review Standards (DSRS's).

The overlapping content requirements among new reactor applications are illustrated by the Standard Review Plan and by the DSRS's. The individual sections of the Standard Review Plan and DSRS's provide Review Procedures specifying how a reviewer should complete review of the relevant information and verify the applicable acceptance criteria.

[1] The "One Design - One Review" approach also could factor into the review of any combined license ("COL") applications that reference the mPower DCD to the extent that the COL applications repeat design information that already has been reviewed in earlier applications. As already provided in 10 CFR 52.79(d), if a COL application references the mPower DCD, then the application may incorporate that DCD information by reference. This has been the practice for recent COL applications that reference DCDs. The DCD information has finality according to 10 CFR 52.63 and does not need to be re-reviewed, and cannot be changed or challenged under most circumstances.

These content requirements are often the same for construction permit (CP), OL, Design Certification (DC), and combined construction and operating license (COL) applications. Therefore, it is expected that the content of these applications would overlap.

Clinch River Construction Permit Application

Currently TVA intends to submit the CPA after the DCA. The CPA is being prepared in accordance with the requirements of 10 CFR Part 50 (Domestic Licensing of Production and Utilization Facilities), including the content requirements of 10 CFR 50.33, 50.34, and 50.34a. Use of these regulations requires a specific level of design information. 10 CFR 50.34(a)(3) requires that the PSAR submitted with the CPA include the "preliminary design of the facility."

Use of the Part 50 process for the Clinch River project allows for the effective and systematic development of project licensing, design finalization, and construction. The PSAR is being prepared utilizing the guidance of Regulatory Guide 1.70, Rev. 3, "*Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants*" (Nov. 1978) and the organizational structure of NUREG-0800, "*Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition*" ("Standard Review Plan") and the DSRS's.

At a minimum, the level of detail provided in the CPA will be consistent with the standard content guidance defined in Regulatory Guide 1.70. TVA recognizes that additional mPower design information will be available due to the development and submittal of the DCA prior to the CPA. TVA expects to include DCA information in the CPA where it will improve NRC review efficiency, but not where additional information would be inappropriate for a CPA or would unduly limit flexibility during construction. TVA would include additional information in the OL application phase of the project to address additional operational programs, design changes, and other additional information that is available as a result of the design maturing. However, the CPA application will be consistent with mPower design information provided in the DCA because of the overlapping content requirements for CPA and DCA.

Under the "One Design - One Review" approach, any design information in the CPA that is identical to corresponding design information in the DCA would not need to be re-reviewed during the CPA review. Instead, the NRC Staff (Staff) reviewers for the CPA could rely upon the earlier review performed by Staff as part of the DCA review. Through the use of annotations, the CPA would identify which information has already been provided and reviewed in the DCA. As discussed further below, this approach is consistent with NRC policies and regulatory requirements.

Clinch River OL Application

Following CP issuance, TVA would submit its OL application for the Clinch River site. The OL application would be prepared in accordance with the requirements of 10 CFR Part 50, including the content requirements of 10 CFR 50.33, 50.34, and 50.34a. The application also would be prepared utilizing the guidance of the Standard Review Plan and DSRS's. TVA anticipates that the design information in the OL application would be consistent with mPower design information that is provided in the DCA. This would occur because of the overlapping content requirements for DCAs and OL applications. Submittal of the OL application would be accomplished through close coordination

between TVA and Generation mPower. The OL application would identify differences from information already provided and reviewed in the DCA.

The overlapping content requirements among new reactor applications are illustrated by the Standard Review Plan itself. The Introduction to the Standard Review Plan (page 4) states: "The [Standard Review Plan] was originally written for 10 CFR Part 50 license applications. For DC and COL applications submitted under 10 CFR Part 52, the level of design information reviewed should be consistent with that of a final safety analysis report (FSAR) submitted in an OL application." Therefore, the information provided in TVA's Clinch River site OL application generally would be consistent with the level of detail provided in the mPower DCA and future COL applications.

Under the "One Design - One Review" approach, any design information in the OL application that is consistent with corresponding design information in the earlier DCA would not need to be re-reviewed during the OL review. Instead, the Staff reviewers for the OL application could rely upon the earlier review performed by Staff as part of the DC review.

III. THE "ONE DESIGN - ONE REVIEW" APPROACH IS CONSISTENT WITH THE ATOMIC ENERGY ACT, NRC REGULATORY REQUIREMENTS, AND NRC POLICY

As described above, TVA intends the "One Design - One Review" approach to be a method for ensuring consistency in and improving the efficiency of the review of identical mPower design information across applications. TVA does not intend for this review approach to alter the NRC's legal requirements in any manner.

The Atomic Energy Act of 1954, as amended, provides the statutory authority for all of the new reactor licensing activities discussed above for the mPower design. In particular, Section 103 of the Atomic Energy Act authorizes issuance of commercial licenses for production or utilization facilities. Neither Section 103 nor any other section of the Atomic Energy Act prohibits the "One Design - One Review" approach envisioned by TVA.

Additionally, the "One Design - One Review" approach would not alter the existing procedural regulatory requirements for the various types of applications. The details of how the Staff conducts its reviews of these applications are a policy matter and are not governed by regulation. Thus, the Staff's use of a single review of identical design issues across applications does not impact the public participation requirements in NRC regulations. For example, mPower design information reviewed by the Staff as part of the DCA would be subject to the public comment process during safety review and DC rulemaking. If identical information is provided later in the CPA, then the site-specific aspects of the design information would still be made available for public review and comment, and would additionally be subject to the CP hearing process. The Staff's reliance on its earlier review of the identical information would not alter the public participation aspects of these licensing proceedings.

The "One Design - One Review" approach also is consistent with NRC guidance and policy. In particular, this approach is an extension of the design-centered review approach ("DCRA") set forth in Regulatory Issue Summary ("RIS") 2006- 06, "New Reactor Standardization Needed to Support the Design-Centered Review Approach"

(May 31, 2006). Under the DCRA, a reference COL ("R-COL") application sets forth standardized application content. A subsequent COL ("S-COL") application then identifies content that is the same as that in the R-COL application. As stated in RIS 2006-06, "The DCRA permits significant streamlining of S-COL application reviews because standardization results in the review becoming a verification that the previously completed R-COL application review applies to S-COL applications rather than being a unique review." Similarly, in SECY 2006-0187, "Semiannual Update of the Status of New Reactor Licensing Activities and Future Planning for New Reactors" (Aug. 25, 2006), the NRC explained (page 17):

> The staff's DCRA strategy is based on a concept of industry standardization of COL applications referencing a particular design (e.g., COL applications referencing either the AP1000, ESBWR, ABWR, or EPR reactor designs). This approach will use, to the maximum extent practical, a "one issue, one review, one position" strategy to optimize the review effort, the resources needed to perform these reviews, and the review schedules. In effect, the staff will conduct one technical review for each reactor design issue and use this one decision to support the decision on a DC and on multiple COL applications.

The R-COL/S-COL process utilized in current COL applications appears to be working as designed and having the desired benefits.

The underlying policy issues for the "One Design - One Review" approach envisioned by TVA are the same as those for the DCRA approach using R-COLs and S-COLs. Consistent with the strategy described above, the Staff would conduct one technical review for each reactor design issue for the mPower reactor. Specifically, TVA's CPA would identify information that is the same as that provided in the DCA. Under these circumstances, the Staff should be able to verify that the content is the same, rather than re-review the content. TVA envisions the "One Design - One Review" approach to be an extension of the DCRA approach to include relevant sections of a Part 50 application in addition to the Part 52 applications typically discussed with respect to the DCRA. This approach should result in significant benefits.

The Commission encouraged standardization of reviews of a reactor design in its 2008 policy statement on the licensing of new reactors. In the Policy Statement, *Conduct of New Reactor Licensing Proceedings*, Section 11.B addresses treatment of generic issues in multiple applications (73 Fed. Reg. 20,971-973). The Commission stated that it "believes that generic consideration of issues common to several applications may well yield benefits, both in terms of effective consideration of issues and efficiency" (73 Fed. Reg. at 20,971). The Commission also stated, "If a COL applicant adopts an approach to a technical issue previously found acceptable, no further staff review of the adequacy of the approach is necessary" (73 Fed. Reg. at 20,973 (emphasis added)). While the policy statement focuses on DC and COL applications, the same principles apply to applications related to the mPower design. TVA's proposed "One Design - One Review" approach is supported by the Commission's policy statement.

IV. BENEFITS OF THE "ONE DESIGN - ONE REVIEW" APPROACH

Use of the "One Design - One Review" approach offers important benefits to NRC, TVA, Generation mPower, and the public. First, and perhaps most importantly, this approach would result in standard and consistent reviews by the Staff based on the same

information. For example, under this approach a conclusion regarding specific design information made by Staff during the DC review would be relied upon during the CPA and OL review, which would prevent a different conclusion from being reached on the same design information. This consistency would result in less uncertainty and a more stable licensing process from the perspective of applicants and the public.

Additionally, the "One Design - One Review" approach would result in more efficiency and less complexity during the reviews of the CP, OL, and DCAs related to the mPower design. This increased efficiency and reduced complexity could translate into less Staff resources needed for reviewing the applications, which could in turn result in shortened licensing reviews and decreased costs to the NRC, applicants and taxpayers.

The "One Design - One Review" approach also would encourage standardization among projects using a similar design. Standardization has many benefits, including those discussed above. Standardization also can result in enhanced safety, reliability, and availability of nuclear power plants.