Tennessee Valley Authority, 1101 Market Street, Chattanooga, TN 37402

CNL-18-043

March 16, 2018

10 CFR 52, Subpart A

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Clinch River Nuclear Site
NRC Docket No. 52-047

Subject: Submittal of Revised Site Safety Analysis Report Subsection 2.4.3.2, "Probable Maximum Precipitation," in Support of Early Site Permit Application for Clinch River Nuclear Site

Reference: Letter from TVA to NRC, CNL-17-151, "Revision 1 of Application for Early Site Permit for Clinch River Nuclear Site," dated December 15, 2017

By letter dated December 15, 2017 (Reference), Tennessee Valley Authority (TVA) submitted Revision 1 of the application for an early site permit (ESP) for Clinch River Nuclear Site. During a February 22, 2018 telephone call, the Nuclear Regulatory Commission (NRC) requested clarification to ESP application, Part 2, "Site Safety Analysis Report (SSAR)," Subsection 2.4.3.2, "Probable Maximum Precipitation," and SSAR Figure 2.4.3-2, "Rainfall Time Distribution - Typical Mass Curve," regarding reference to the 3382, 2912, and 469 square mile probable maximum precipitation (PMP) storms and the 7980 square mile PMP storm.

The purpose of this letter is to provide a revision to SSAR Subsection 2.4.3.2 and Figure 2.4.3-2 clarifying reference to the PMP storms. An editorial change is being made to SSAR Subsection 2.4.3.2 as indicated in the third paragraph on page 1 of the enclosure and a note is being inserted on SSAR Figure 2.4.3-2 as indicated on page 2 of the enclosure to clarify reference to the 3382, 2912, and 469 square mile PMP storms. An editorial change is also being made to correct the 3382 square mile PMP storm as indicated in the first paragraph on page 1 of the enclosure. The revised SSAR subsection and figure will be incorporated in a future revision of the ESP application.

There are no new regulatory commitments associated with this submittal. If any additional information is needed, please contact Dan Stout at (423) 751-7642.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 16th day of March 2018.

Respectfully,

J. W. Shea

Digitally signed by J. W. Shea
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J. W. Shea
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Enclosure

Clinch River Nuclear Site Safety Analysis Report Revised Subsection 2.4.3.2 and Figure 2.4.3-2

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ENCLOSURE

CLINCH RIVER NUCLEAR
SITE SAFETY ANALYSIS REPORT
REVISED SUBSECTION 2.4.3.2 AND FIGURE 2.4.3-2

The following paragraphs of SSAR Subsection 2.4.3.2 are being revised as indicated. Strikethroughs indicate text to be deleted. Underlines indicate text to be added.

2.4.3.2 Probable Maximum Precipitation

The ~~3380~~3382, 2912, and 469 sq mi PMP storms are modeled as nine-day events. A three-day antecedent storm was postulated to occur three days prior to the three-day PMP storm in each PMF determination. Rainfall depths equivalent to 30 percent of the main storm were used for the antecedent storms for the ~~3380~~3382, 2912, and 469 sq mi storms uniform areal distribution. These conditions are as recommended in HMR-56 report (Reference 2.4.3-4).

The 7980 sq mi PMP event is also modeled as a nine-day event with a similar three-day antecedent storm, three-day dry period, and three-day main storm pattern. Antecedent storm rainfall depths applied were equivalent to 40 percent of the main storm with a uniform areal distribution. The HMR-41 report (Reference 2.4.3-1) states that a subsequent rainfall is applicable for this storm. However, the peak elevation at the CRN Site during this PMF event occurs about 12 hours before the beginning of any subsequent rainfall, during a period when any subsequent rainfall induced increased flows could not compensate for the rate at which the upstream dams failure discharges are decreasing.

Temporal distribution patterns were adopted for all events based upon major observed storms transposable to the Tennessee Valley and distributions used by Federal agencies. The adopted distributions were within the limits stipulated in Chapter VII of HMR-41 (Reference 2.4.3-1) or Section 2.2.14 of HMR-56 (Reference 2.4.3-4) as applicable. These distributions placed the heaviest precipitation approximately in the middle of the antecedent and main storms. The twelve 6-hour rainfall increments of each 72-hour storm were ordered from D1 (maximum depth) to D12 (smallest depth). In the 3382, 2912, and 469 sq mi PMP storms, the rainfall increments were ~~and~~ applied in each 72-hour duration in the following sequence: D12, D11, D10, D9 (first 24 hours), D2, D1, D3, D4 (middle 24 hours) and D5, D6, D7, D8 (last 24 hours). The adopted sequence closely conforms to the method used by the U.S. Army Corps of Engineers (USACE) (Reference 2.4.3-3). A typical distribution mass curve resulting from this approach is shown in Figure 2.4.3-2. The ~~and the~~ controlling 7980 sq mi Bulls Gap centered storm temporal distribution is shown in Table 2.4.3-3.

As shown in Table 2.4.3-1, the PMP event producing the highest PMF water surface elevation at the CRN Site was determined to result from the 7980 sq mi Bulls Gap centered storm producing PMP on the watershed as defined in HMR-41 (Reference 2.4.3-1). The PMP storm having the largest seasonal precipitation occurs in March and would produce 17.02 inches of rainfall in three days on the watershed above Watts Bar Dam (Reference 2.4.3-1). The storm producing the PMP would be preceded by a three-day antecedent storm producing 6.00 inches of rainfall, which would end three days prior to the start of the PMP storm.

SSAR Figure 2.4.3-2 is being revised (inserted applicable PMP storms box) and will be replaced with the following figure.

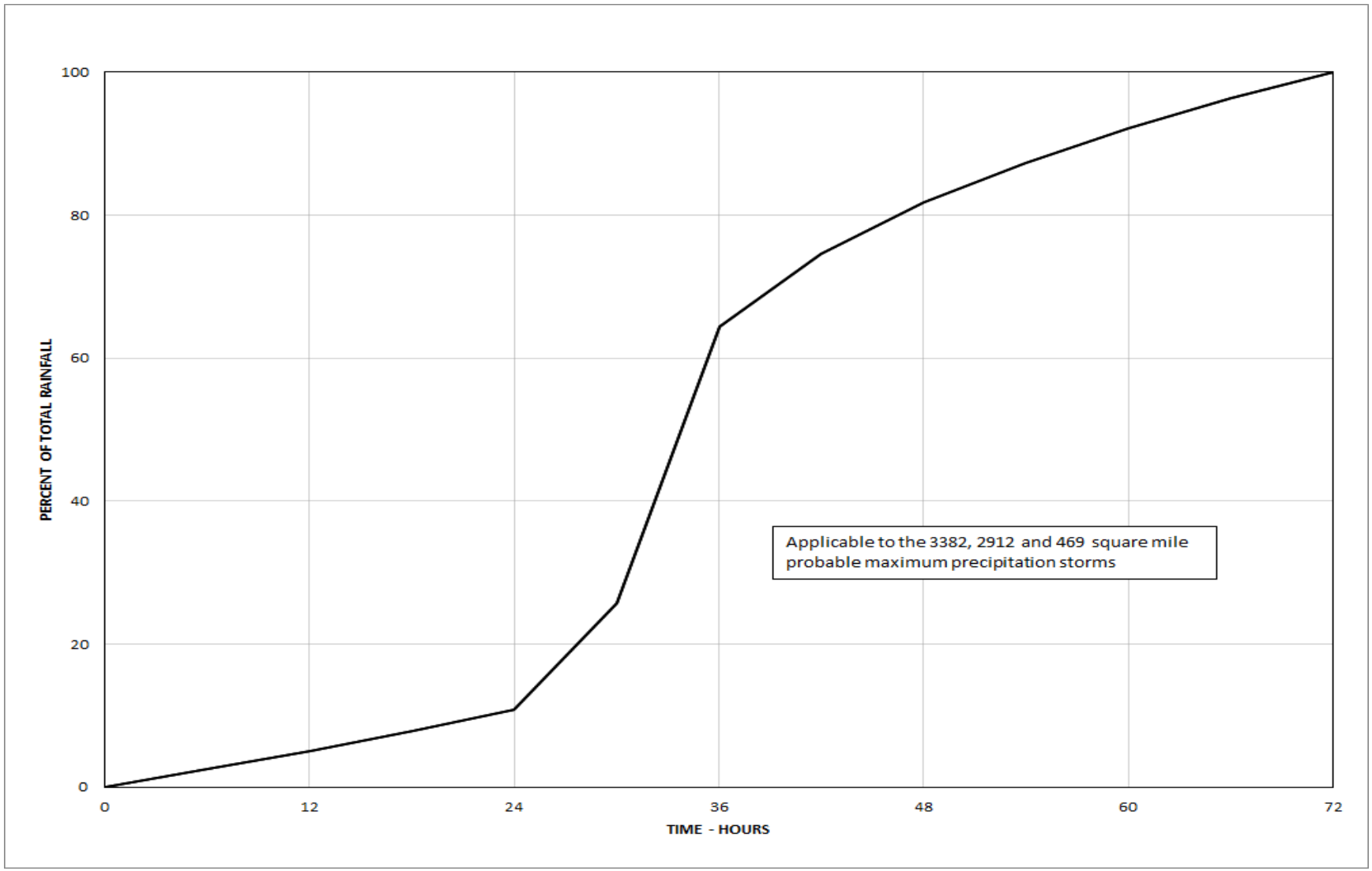

Figure 2.4.3-2. Rainfall Time Distribution – Typical Mass Curve