*General Directions: This Model SE provides the format and content to be used when preparing the plant-specific SE of an LAR to adopt traveler TSTF-564, Revision 2. The **bolded** bracketed information shows text that should be filled in for the specific amendment; individual licensees would furnish site-specific nomenclature or values for these bracketed items. The italicized NOTEs provide guidance on what should be included in each section and should not be included in the SE.*

REVISED FINAL MODEL SAFETY EVALUATION

BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO TECHNICAL SPECIFICATIONS TASK FORCE TRAVELER

TSTF-564, REVISION 2, "SAFETY LIMIT MCPR,"

USING THE CONSOLIDATED LINE ITEM IMPROVEMENT PROCESS

1.0 INTRODUCTION AND BACKGROUND

By application dated **[enter date]**, (Agencywide Documents Access and Management System (ADAMS) Accession No. **[MLXXXXXXXXX]**), **[as supplemented by letters dated [enter date(s)]], [name of licensee]** (the licensee) submitted a license amendment request (LAR) for **[name of facility (abbreviated name), applicable units]**.

The LAR proposed to revise the value of the technical specification (TS) 2.1.1.2 reactor core safety limit (SL) minimum critical power ratio (MCPR). The MCPR protects against boiling transition on the fuel rods in the core and delete reference to single- and two-loop operation. The current MCPR value is dependent on the number of recirculation loops in operation and ensures that 99.9 percent of the fuel rods in the core are not susceptible to boiling transition, which is referred to as the $MCPR_{99.9\%}$. The revised MCPR would ensure that there is a 95 percent probability at a 95 percent confidence level that no fuel rods will be susceptible to boiling transition using an SL based on critical power ratio (CPR) data statistics, which is referred to as the $MCPR_{95/95}$. The $MCPR_{95/95}$ is not dependent on the number of recirculation loops in operation. Additionally, TS 5.6.3, "Core Operating Limits Report **[(COLR)]**," would be modified to require that the COLR include the cycle-specific value for $MCPR_{99.9\%}$, which would still be used to calculate the MCPR operating limit (OL).

The proposed changes are based on Technical Specifications Task Force (TSTF) traveler TSTF-564, Revision 2, "Safety Limit MCPR," dated October 24, 2018 (ADAMS Accession No. ML18297A361). The U.S. Nuclear Regulatory Commission (NRC or the Commission) issued a final safety evaluation (SE) approving traveler TSTF-564, Revision 2, on November 16, 2018 (ADAMS Accession No. ML18299A069).

[The licensee has proposed several variations from the TS changes described in traveler TSTF-564, Revision 2. The variations are described in Section [2.2] of this SE and evaluated in Section [3.X].]

[The supplemental letter(s) dated [enter date(s)], provided additional information that clarified the application, did not expand the scope of the application as originally

noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on [enter date] (cite FR reference).]

1.1 Background on Boiling Transition

During steady-state operation in a boiling-water reactor (BWR), most of the coolant in the core is in a flow regime known as annular flow. In this flow regime, a thin liquid film is pushed up the surface of the fuel rod cladding by the bulk coolant flow, which is mostly water vapor with some liquid water droplets. This provides effective heat removal from the cladding surface; however, under certain conditions, the annular film may dissipate, which reduces the heat transfer and results in an increase in fuel cladding surface temperature. This phenomenon is known as boiling transition or dryout. The elevated surface temperatures resulting from dryout may cause fuel cladding damage or failure.

1.2 Background on Critical Power Correlations

For a given set of reactor operating conditions (pressure, flow, etc.), dryout will occur on a fuel assembly at a certain power, known as the critical power. Because the phenomena associated with boiling transition are complex and difficult to model purely mechanistically, thermal-hydraulic test campaigns are undertaken using electrically heated prototypical fuel bundles to establish a comprehensive database of critical power measurements for each BWR fuel product. These data are then used to develop a critical power correlation that can be used to predict the critical power for assemblies in operating reactors. This prediction is usually expressed as the ratio of the actual assembly power to the critical power predicted using the correlation, known as the CPR.

One measure of the correlation's predictive capability is based on its validation relative to the test data. For each point j in a correlation's test database, the experimental critical power ratio (ECPR) is defined as the ratio of the measured critical power to the calculated critical power, or:

$$\mathrm{ECPR}_j = \frac{\text{Measured Critical Power}_j}{\text{Calculated Critical Power}_j}$$

For ECPR values less than or equal to 1, the calculated critical power is greater than or equal to the measured critical power and the prediction is considered to be non-conservative. Because the measured critical power includes random variations due to various uncertainties, evaluating the ECPR for all of the points in the dataset (or, ideally, a subset of points that were not used in the correlation's development) results in a probability distribution. This ECPR distribution allows the predictive uncertainty of the correlation to be determined. This uncertainty can then be used to establish a limit above which there can be assumed that boiling transition will not occur (with a certain probability and confidence level).

1.3 Background on Thermal-Hydraulic Safety Limits

To protect against boiling transition, BWRs have implemented an SL on the CPR, known as the MCPR SL. As discussed in **[Chapter 4]** of the **[PLANT]** Final Safety Analysis Report (FSAR) and the Standard Technical Specifications (STSs) for General Electric BWR plant designs in

NUREG-1433 and NUREG-1434,[1] the current calculation of the MCPR SL is to prevent 99.9 percent of the fuel in the core from being susceptible to boiling transition. This limit is typically developed by considering various cycle-specific power distributions and uncertainties, and is highly dependent on the cycle-specific radial power distribution in the core. As such, the limit may need to be updated as frequently as every cycle. *{NOTE: The use of legacy fuels is outside the scope of a CLIIP LAR. For additional details, see Section 3.3 of the NRC staff's SE of traveler TSTF-564, Revision 2, dated November 16, 2018.}*

The fuel cladding SL for pressurized-water reactor (PWR) designs, described in the STSs for Babcock & Wilcox, Westinghouse, and Combustion Engineering [2] plants in NUREG-1430, NUREG-1431, and NUREG-1432,[3] respectively, correspond to a 95 percent probability at a 95 percent confidence level that departure from nucleate boiling (DNB) will not occur. As a result of the overall approach taken in developing the PWR limits, they are only dependent on the fuel type(s) in the reactor and the corresponding departure from nucleate boiling ratio (DNBR) correlations. The limits are not cycle-dependent and are typically only updated when new fuel types are inserted in the reactor.

The TSs for **[PLANT]** also have a limiting condition for operation (LCO) that governs MCPR, known as the MCPR OL. The OL on MCPR is an LCO which must be met to ensure that anticipated operational occurrences (AOOs) do not result in fuel damage. The current MCPR OL is calculated by combining the largest change in CPR from all analyzed transients, also known as the ΔCPR, with the MCPR SL. The MCPR OL is already a COLR parameter and as such, the methodology to calculate it is included in TS 5.6.3.b. The MCPR SL (i.e., the $MCPR_{99.9\%}$) is calculated using the same methodology as the MCPR OL. *{NOTE: Should this change (i.e., different methodologies be used to calculate each MCPR), both methodologies would need to be included in TS 5.6.3.b, because the $MCPR_{99.9\%}$ and the MCPR OL are both COLR parameters.}*

2.0 REGULATORY EVALUATION

2.1 Description of TS Sections

2.1.1 TS 2.1.1, "Reactor Core SLs"

The SLs ensure that specified acceptable fuel design limits are not exceeded during steady state operation, normal operational transients, and AOOs.

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[1] U.S. Nuclear Regulatory Commission, "Standard Technical Specifications, General Electric Plants BWR/4," NUREG-1433, Volume 1, "Specifications," and Volume 2, "Bases," Revision 4.0, April 2012 (ADAMS Accession Nos. ML12104A192 and ML12104A193).

U.S. Nuclear Regulatory Commission, "Standard Technical Specifications, General Electric Plants BWR/6," NUREG-1434, Volume 1, "Specifications," and Volume 2, "Bases," Revision 4.0, April 2012 (ADAMS Accession Nos. ML12104A195 and ML12104A196).

[2] Denotes applicability to Combustion Engineering plants with digital control systems only.

[3] U.S. Nuclear Regulatory Commission, "Standard Technical Specifications, Babcock and Wilcox Plants," NUREG-1430, Volume 1, "Specifications," and Volume 2, "Bases," Revision 4.0, April 2012 (ADAMS Accession Nos. ML12100A177 and ML12100A178).

U.S. Nuclear Regulatory Commission, "Standard Technical Specifications, Westinghouse Plants," NUREG-1431, Volume 1, "Specifications," and Volume 2, "Bases," Revision 4.0, April 2012 (ADAMS Accession Nos. ML12100A222 and ML12100A228).

U.S. Nuclear Regulatory Commission, "Standard Technical Specifications, Combustion Engineering Plants," NUREG-1432, Volume 1, "Specifications," and Volume 2, "Bases," Revision 4.0, April 2012 (ADAMS Accession Nos. ML12102A165 and ML12102A169).

[PLANT] TS 2.1.1.2 currently requires that the reactor steam dome pressure greater than or equal to (≥) **[785]** pounds per square inch gauge (psig) and core flow ≥ 10 percent rated core flow, the MCPR shall be ≥ **[1.07]** for two recirculation loop operation or ≥ **[1.08]** for single recirculation loop operation. The MCPR SL (also referred to as $MCPR_{99.9\%}$) ensures that 99.9 percent of the fuel rods in the core are not susceptible to boiling transition.

2.1.2 TS 5.6.3, "Core Operating Limits Report **[(COLR)]**"

[PLANT] TS 5.6.3 requires core operating limits to be established prior to each reload cycle, or prior to any remaining portion of a reload cycle. This TS requires that these limits be documented in the COLR.

2.2 Proposed Changes to the TSs

The licensee proposed to revise the MCPR SL in TS 2.1.1.2 to make it cycle-independent, consistent with the method described in traveler TSTF-564, Revision 2.

The proposed changes to the **[PLANT]** TSs revise the value of the MCPR SL in TS 2.1.1.2 to **[1.07]**, with corresponding changes to the associated TS bases. The change to TS 2.1.1.2 replaces the existing separate SLs for single- and two-recirculation loop operation with a single limit since the revised SL (also referred to as the $MCPR_{95/95}$ SL) is not dependent on the number of recirculation loops in operation.

The $MCPR_{99.9\%}$ (i.e., the current MCPR SL) is an input to the MCPR OL in LCO 3.2.2, "Minimum Critical Power Ratio (MCPR)." While the definition and method of calculation of both the $MCPR_{99.9\%}$ and the LCO 3.2.2 MCPR OL remains unchanged, the proposed TS changes include revisions to TS 5.6.3, to require the $MCPR_{99.9\%}$ value used in calculating the LCO 3.2.2 MCPR OL to be included in the cycle-specific COLR.

[In addition, the licensee proposed variations from the TS changes described in TSTF-564 or the applicable parts of the NRC staff's SE. The proposed variations are described below:]

2.3 Applicable Regulatory Requirements and Guidance

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.36(a)(1), requires an applicant for an operating license to include in the application proposed TSs in accordance with the requirements of 10 CFR 50.36. The applicant must also include in the application, a "summary statement of the bases or reasons for such specifications, other than those covering administrative controls." However, per 10 CFR 50.36(a)(1), these TS bases "shall not become part of the technical specifications."

As required by 10 CFR 50.36(c)(1), TSs will include safety limits, limiting safety system settings, and limiting control settings. The regulation, 10 CFR 50.36(c)(1)(i)(A), states, in part:

> Safety limits for nuclear reactors are limits upon important process variables that are found to be necessary to reasonably protect the integrity of certain of the physical barriers that guard against the uncontrolled release of radioactivity. If any safety limit is exceeded, the reactor must be shut down. The licensee shall

> notify the Commission, review the matter, and record the results of the review, including the cause of the condition and the basis for corrective action taken to preclude recurrence. Operation must not be resumed until authorized by the Commission.

As required by 10 CFR 50.36(c)(2)(i), the TSs will include LCOs, which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met. Additionally, as required by 10 CFR 50.36(c)(5), TSs must include administrative controls, which are the provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner.

{NOTE: The bracketed text below is only applicable to plants licensed to the 10 CFR Part 50 Appendix A General Design Criteria (GDC). If the plant is a pre-GDC plant, the bracketed text below should be replaced with a discussion of the plant-specific design criterion that is equivalent to Criterion 10 and that describes how the plant-specific design criterion accomplishes the same function. Language for pre-GDC plants should be included in Section 2.2 of the LAR.}

[Criterion 10, "Reactor design," of 10 CFR Part 50 Appendix A, "General Design Criteria of Nuclear Power Plants," states:

> **The reactor core and associated coolant control and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.**

The limits placed on the MCPR act as a specified acceptable fuel design limit to prevent boiling transition, which has the potential to result in fuel rod cladding failure, and are used to meet Criterion 10.]

The NRC staff's guidance contained in Revision 2 of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition" (SRP), Section 4.4, "Thermal and Hydraulic Design,"[4] provides the following two examples of acceptable approaches to meet SRP Acceptance Criterion 1 for establishing fuel design limits:

A. For departure from nucleate boiling ratio (DNBR), CHFR [critical heat flux ratio] or CPR correlations, there should be a 95-percent probability at the 95-percent confidence level that the hot rod in the core does not experience a DNB or boiling transition condition during normal operation or AOOs.

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[4] U.S. Nuclear Regulatory Commission, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," NUREG-0800, Section 4.4, "Thermal and Hydraulic Design," Revision 2, March 2007 (ADAMS Accession No. ML070550060).

B. The limiting (minimum) value of DNBR, CHFR, or CPR correlations is to be established such that at least 99.9 percent of the fuel rods in the core will not experience a DNB or boiling transition during normal operation or AOOs.

The NRC staff's guidance for the review of TSs is in Chapter 16.0, Revision 3, "Technical Specifications," of the SRP, dated March 2010 (ADAMS Accession No. ML100351425). As described therein, as part of the regulatory standardization effort, the NRC staff has prepared STSs for each of the LWR nuclear designs. Accordingly, the NRC staff's review considers whether the proposed changes are consistent with the applicable reference STSs (i.e., the current STSs), as modified by NRC-approved travelers. The STS applicable to **[PLANT]** is **[NUREG-1433, Revision 4.0, "Standard Technical Specifications, General Electric Plants BWR/4," Volume 1, "Specifications," and Volume 2, "Bases," April 2012 (ADAMS Accession Nos. ML12104A192 and ML12104A193, respectively) OR NUREG-1434, Revision 4.0, "Standard Technical Specifications, General Electric Plants BWR/6," Volume 1, "Specifications," and Volume 2, "Bases," (ADAMS Accession Nos. ML12104A195 and ML12104A196).]**

3.0 TECHNICAL EVALUATION

3.1 Basis for Proposed Change

As discussed in Section 1.3 of this SE, the current MCPR SL (i.e., the $MCPR_{99.9\%}$ SL) is dependent on the cycle-specific core design, especially including the core power distribution, fuel type(s) in the reactor, and the power-to-flow operating domain for the plant. As such, it is frequently necessary to change the MCPR SL to accommodate new core designs. Changes to the MCPR SL are usually determined late in the design process and necessitate an accelerated NRC review (i.e., LAR) to support the subsequent fuel cycle.

The licensee proposed to change the calculation for determining the MCPR SL for **[PLANT]** so that it is no longer cycle-dependent, reducing the frequency of revisions and eliminating the need for NRC's review on an accelerated schedule. The proposed methodology for determining the MCPR SL aligns it with the DNBR SL used in PWRs, which ensures a 95 percent probability at a 95 percent confidence level that no fuel rods will experience DNB.

The NRC staff finds that calculating the revised MCPR SL based on the 95/95 criterion is acceptable because it meets SRP Section 4.4, Acceptance Criterion 1. The remainder of this SE evaluates whether the methodology for determining the revised MCPR SL provides the intended result and documents the review to ensure that the revised MCPR SL can be adequately determined in the core using various types of fuel, that the proposed SL continues to fulfil the necessary functions of an SL without unintended consequences, and that the proposed changes have been adequately implemented in the **[PLANT]** TSs.

3.2 Revised MCPR SL Definition

As discussed in Section 1.2 of this SE, the ECPR distribution quantifies the uncertainty associated with the correlation. Traveler TSTF-564, Revision 2, provides the following formula:

$$\mathrm{MCPR}_{95/95}(i) = \mu_i + \kappa_i \sigma_i$$

where μ_i is the mean ECPR and σ_i is the standard deviation of the ECPR distribution. The statistical parameter (κ_i) is selected, based on the number of samples in the critical power

database, to provide “95% probability at 95% confidence (95/95) for the one-sided upper tolerance limit that depends on the number of samples (N_i) in the critical power database.” This is a commonly used statistical formula to determine a 95/95 one-sided upper tolerance limit for a normal distribution, which is appropriate for the situation under consideration. The factor κ is generally attributed to D. B. Owen[5] and was also reported by M. G. Natrella,[6] as referenced in traveler TSTF-564, Revision 2. Example values of κ are provided in Table 2 of traveler TSTF-564, Revision 2. Table 1 of the traveler includes some reference values of the $MCPR_{95/95}$.

As discussed by Piepel and Cuta[7] for DNBR correlations, the acceptability of this approach is predicated on a variety of assumptions, including the assumptions that the correlation data comes from a common population and that the correlation’s population is distributed normally. These assumptions are typically addressed generically when a critical power or critical heat flux correlation is reviewed by the NRC staff, who may apply penalties to the correlation to account for any issues identified. TSTF letter dated May 29, 2018 (ADAMS Accession No. ML18149A320), states that such penalties applied during the NRC’s review of the critical power correlation would be imposed on the mean or standard deviation used in the calculating the $MCPR_{95/95}$. These penalties would also continue to be imposed in the determination of the $MCPR_{99.9\%}$, along with any other penalties associated with the process of (or other inputs used in) determining the $MCPR_{99.9\%}$ (e.g., penalties applied to the $MCPR_{99.9\%}$ SL for operation in the Maximum Extended Load Limit Line Analysis Plus (MELLLA+) operating domain).

In the SE of traveler TSTF-564, Revision 2, the NRC staff found that the definition of the $MCPR_{95/95}$ appropriately establishes a 95/95 upper tolerance limit on the critical power correlation and that any issues in the underlying correlation will be addressed through penalties on the correlation mean and standard deviation, as necessary. Therefore, the NRC staff concludes that the method for determining $MCPR_{95/95}$ can be used to establish acceptable fuel design limits in **[PLANT]** TSs.

3.3 Determination of Revised MCPR SL for Mixed Cores

Traveler TSTF-564, Revision 2, proposed that a core containing a variety of fuel types would evaluate the $MCPR_{95/95}$ for all of the fresh and once-burnt fuel in the core and apply the most limiting (i.e., the largest) value of $MCPR_{95/95}$ for each of the applicable fuel types as the MCPR SL. As stated in Section 3.1 of traveler TSTF-564, Revision 2, this is because bundles that are twice-burnt or more at the beginning of the cycle have significant MCPR margin relative to the fresh and once-burnt fuel. The justification is that the MCPR for twice-burnt and greater fuel is far enough from the MCPR for the limiting bundle that its probability of boiling transition is very small compared to the limiting bundle and it can be neglected in determining the SL. Results of a study provided in TSTF letter dated May 29, 2018, indicate that this is the case even for fuel operated on short (12-month) reload cycles. As discussed in the traveler, twice-burnt or greater fuel bundles are included in the cycle-specific evaluation of the $MCPR_{99.9\%}$ and the MCPR OL. If a twice-burnt or greater fuel bundle is found to be limiting, it would be governed by the MCPR OL, which will always be more restrictive than both the $MCPR_{95/95}$ and the $MCPR_{99.9\%}$.

[5] D. B. Owen, “Factors for One-Sided Tolerance Limits and for Variables Sampling Plans,” Sandia Corporation, SCR-607, March 1963, ADAMS Accession No. ML14031A495.

[6] M. G. Natrella, “Experimental Statistics,” National Bureau of Standards, National Bureau of Standards Handbook 91 August 1963.

[7] G. F. Piepel and J. M. Cuta, “Statistical Concepts and Techniques for Developing, Evaluating, and Validating CHF Models and Corresponding Fuel Design Limits,” SKI Technical Report, 93:46, 1993.

In the SE of the traveler TSTF-564, Revision 2, the NRC staff found the justification for applying the most limiting (i.e., the largest) value of $MCPR_{95/95}$ for each of the applicable fuel types as the MCPR SL to be appropriate and determined that it is acceptable to determine the $MCPR_{95/95}$ SL for the core based on the most limiting value of the $MCPR_{95/95}$ for the fresh and once-burnt fuel in the core. In the SE of traveler TSTF-564, Revision 2, the NRC staff also found that the process for establishing the revised MCPR SL for mixed cores ensures that the limiting fuel types in the core will be evaluated and the limiting $MCPR_{95/95}$ will be appropriately applied as the SL. Therefore, the NRC staff finds it acceptable to determine the $MCPR_{95/95}$ SL for the core based on the most limiting $MCPR_{95/95}$ value for fresh and once-burnt fuel in the core for the **[PLANT]** TSs.

3.4 MCPR Safety and Operating Limits

As discussed in the TSTF letter dated May 29, 2018, the $MCPR_{99.9\%}$ SL is expected to always be greater than the $MCPR_{95/95}$ SL for two reasons. First, because the $MCPR_{99.9\%}$ includes uncertainties not factored into the $MCPR_{95/95}$, and second, because the 99.9 percent probability basis for determining the $MCPR_{99.9\%}$ is more conservative than the 95 percent probability at a 95 percent confidence level used in determining the $MCPR_{95/95}$. The level of conservatism in the $MCPR_{95/95}$ SL is appropriate because the lead fuel rod in the core (i.e., the limiting fuel rod with respect to MCPR) is used to evaluate whether any fuel rods in the core are susceptible to boiling transition, which is also discussed in the traveler. This is consistent with evaluations performed for PWRs using a 95/95 upper tolerance limit on the correlation uncertainty as an SL.

Consistent with Traveler TSTF-564, Revision 2, the licensee is not proposing any change to LCO 3.2.2 and will continue to calculate the MCPR OL using the $MCPR_{99.9\%}$. The $MCPR_{99.9\%}$ will continue to be calculated in the same way as it is currently, using the whole core.

Consistent with Traveler TSTF-564, Revision 2, the licensee proposed to revise TS 5.6.3 to require inclusion of the cycle-specific value of the $MCPR_{99.9\%}$ in the COLR to ensure that the uncertainties being removed from the MCPR SL are still included as part of the MCPR OL. The methods used for determining $MCPR_{99.9\%}$ are included in the list of COLR references contained in TS 5.6.3.b. *{NOTE: Verify that the licensee calculates MCPR SL and MCPR OL using the methodologies in the TS 5.6.3.b COLR reference list*.} The changes to TS 5.6.3.b help to ensure that the uncertainties being removed from the MCPR SL are still included as part of the MCPR OL and will continue to appropriately inform plant operation.

The NRC staff finds that the changes proposed by the licensee will retain an adequate level of conservatism in the MCPR SL in TS 2.1.1.2 and that plant- and cycle-specific uncertainties will be retained in the MCPR OL as specified in the COLR. The $MCPR_{95/95}$ represents a lower limit on the value of the $MCPR_{99.9\%}$, because the $MCPR_{99.9\%}$ should always be higher since it accounts for numerous uncertainties that are not included in the $MCPR_{95/95}$ (as discussed in Section 3.1 of traveler TSTF-564, Revision 2).

3.5 Implementation of the Revised MCPR SL in the TSs

{NOTE: If the licensee is in the midst of a fuel transition, all types of fresh and once-burnt fuel should be evaluated to determine which provides the limiting $MCPR_{95/95}$, in accordance with the process discussed in traveler TSTF-564, Revision 2.}

{NOTE: If a fuel type not included in Table 1 of traveler TSTF-564, Revision 2, is loaded as fresh or once-burnt fuel, the value of the $MCPR_{95/95}$ reported for that fuel type must be

*calculated using the mean and standard deviation from a critical power correlation found to be acceptable by the NRC staff. This should be evaluated by the NRC staff in this section of the SE and the LAR will **not** be reviewed under the CLIIP.}*

{NOTE: The following text is only applicable if the licensee has a core loaded with the fuel(s) referenced in Table 1 of traveler TSTF-564, Revision 2, or a new fuel type from the LAR, if that new fuel type that has been found acceptable by the NRC staff.}

The licensee proposed to change the value of the SL in TS 2.1.1.2 from **[insert TS text here]** to **[value]**, consistent with the value from **[Table 1 of the TSTF-564, Revision 2, or the LAR if it is a new fuel type],** for the fuel type(s) in use at **[PLANT]** (i.e., **[name of fuel from Table 1 of traveler TSTF-564, Revision 2, or from the LAR if it is a new fuel type]**). As noted in Section 3.3 above, the licensee appropriately evaluated the fresh and once-burnt fuels in use at **[PLANT]** and the NRC staff determined that the limiting $MCPR_{95/95}$ for these fuels was provided for inclusion in TS 2.1.1.2, consistent with the process described in traveler TSTF-564, Revision 2.

The NRC staff finds that the proposed MCPR value of **[value]** in **[PLANT]** TS 2.1.1.2 is acceptable because it was calculated using Equation 1 from traveler TSTF-564, Revision 2, and reported at a precision of two digits past the decimal point with the hundreds digit rounded up. Thus, the proposed TS change is acceptable.

The licensee also proposed that **[PLANT]** TS 5.6.3 require the $MCPR_{99.9\%}$ value used to calculate the LCO 3.2.2 “MCPR” limit be specified in the COLR. Thus **[PLANT]** TS 5.6.3.b will continue to reference appropriate NRC-approved methodologies for determination of the $MCPR_{99.9\%}$ and the MCPR OL, which will ensure that cycle-specific parameters are determined such that applicable limits are met. Therefore, the NRC staff finds the proposed change acceptable.

The NRC staff reviewed the licensee’s proposed TS changes and finds that the licensee appropriately implemented the revised MCPR SL, as discussed in this SE.

3.6 NRC Staff Conclusion

{NOTE: The project manager or reviewer should check the facility’s current licensing basis to determine if GDC 10 is applicable or if an equivalent plant-specific design criterion is used. If the facility licensing basis uses a plant-specific design criterion in lieu of GDC 10, the reference to GDC 10 below should be replaced with a reference to the appropriate design criterion from the facility’s licensing basis.}

The NRC staff reviewed the licensee’s proposed TS changes and determined that the proposed SL associated with TS 2.1.1.2 was calculated in a manner consistent with the process described in traveler TSTF-564, Revision 2, and was therefore acceptably modified to suit the revised definition of the MCPR SL. Under the new definition, the MCPR SL will continue to protect the fuel cladding against the uncontrolled release of radioactivity by preventing the onset of boiling transition, thereby fulfilling the requirements of 10 CFR 50.36(c)(1) for SLs. The MCPR OL in LCO 3.2.2 remains unchanged and will continue to meet the requirements of 10 CFR 50.36(c)(2) **[and Criterion 10 or the equivalent plant-specific design criterion as discussed in Section 2.3 of this SE]** by ensuring that no fuel damage results during normal operation and AOOs. The NRC staff determined that the proposed changes to **[PLANT]** TS 5.6.3 are acceptable; upon adoption of the revised MCPR SL, the COLR will be required to

contain the $MCPR_{99.9\%}$, supporting the determination of the MCPR OL using current methodologies.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the **[Name of State]** State official was notified of the proposed issuance of the amendment on **[enter date]**. The State official had **[no]** comments. **[If comments were provided, they should be addressed here]**.

5.0 ENVIRONMENTAL CONSIDERATION

{*NOTE*: *This section is to be prepared by the PM. As needed, the PM should coordinate with NRR's Environmental Review and NEPA Branch (MENB) to determine the need for an EA. Specific guidance on preparing EAs and considering environmental issues is contained in NRR Office Instruction LIC-203, "Procedural Guidance for Preparing Categorical Exclusions, Environmental Assessments, and Considering Environmental Issues."*}

The amendment changes requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, which was published in the *Federal Register* on **[DATE (XX FR XXX)],** and there has been no public comment on such finding. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

{*NOTE*: *This section is to be prepared by the PM.}*

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

{NOTE: These are the principal contributors for the model SE of the traveler. Replace these names with those who prepared the plant-specific SE.}

Principal Contributors: Reed A. Anzalone, NRR/DSS
Caroline E. Tilton, NRR/DSS

Date: February 25, 2020