Industry/TSTF Standard Technical Specification Change Traveler

Changes to Table 3.3.1-1

Classification: 1) Correct Specifications

NUREGs Affected: ☐ 1430 ☑ 1431 ☐ 1432 ☐ 1433 ☐ 1434

Description:

Correct the Overtemperature delta T equation given in Table 3.3.1-1. Specifically, change the direction of the inequality of P', identify a direction of conservatism for K3, and revise the values and signs for f(delta I).

Justification:

P' - The direction of conservatism is incorrect. The pressure basis for the Overtemperature delta T setpoint is a reference pressure of 2235 psig. The plant setpoint must have a reference pressure equal to or greater than 2235 psig to ensure that the setpoint is conservative, that is, results in an earlier trip, compared to that assumed in the safety analysis.

K3 - The direction of conservatism not identified. This gain is designed to reduce the Overtemperature delta T setpoint for reductions in RCS pressure. It will also increase the setpoint for increases in RCS pressure, but these situations are typically not limiting with respect to the primary criterion of precluding Departure from Nucleate Boiling. Therefore, provided that the setpoint at the plant has a K3 gain equal to or greater than that identified in the Technical Specifications will ensure that the setpoint is conservative, that is, results in an earlier trip, compared to that assumed in the safety analyses

It should be noted that since the K3 gain both reduces and increases the Overtemperature delta T setpoint, it should be set as close as possible to the Technical Specification value to ensure consistency with the safety analyses.

f(delta I) - The order of magnitude and arithmetic signs incorrect. The purpose of the f(delta I) penalty function is to reduce the Overtemperature delta T setpoint to account for skewed axial power shape conditions. Since the K1, K2, and K3 gains of the Overtemperature delta T setpoint are presented in fractions of full power units, the f(delta I) penalty function should be in the same units, as the marked-up Technical Specifications indicate. In addition, the arithmetic signs associated with the f(delta I) penalty function should be such that a reduction of the Overtemperature delta T function results for skewed axial power shapes and therefore, should be changed as shown in the attached markups.

Industry Contact: Buschbaum, Denny (254) 897-5851 dbuschb1@tuelectric.com

NRC Contact: Schulten, Carl 301-314-1192 css1@nrc.gov

Revision History

OG Revision 0 **Revision Status: Active** **Next Action: NRC**

Revision Proposed by: WOG

Revision Description:
Original Issue

Owners Group Review Information

Date Originated by OG: 24-Feb-98

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 24-Feb-98

TSTF Review Information

OG Revision 0 **Revision Status: Active** **Next Action: NRC**

TSTF Received Date: 24-Feb-98 Date Distributed for Review 28-May-98

OG Review Completed: ☑ BWOG ☑ WOG ☑ CEOG ☑ BWROG

TSTF Comments:

WOG Only

TSTF Resolution: Approved Date: 10-Jul-98

NRC Review Information

NRC Received Date: 13-Nov-98 NRC Reviewer:

NRC Comments:

(No Comments)

Final Resolution: NRC Action Pending Final Resolution Date:

Incorporation Into the NUREGs

File to BBS/LAN Date: TSTF Informed Date: TSTF Approved Date:

NUREG Rev Incorporated:

Affected Technical Specifications

LCO 3.3.1 RTS Instrumentation

Change Description: Table 3.3.1-1 (page 7 of 8)

Table 3.3.1-1 (page 7 of 8)
Reactor Trip System Instrumentation

TSTF-310

Note 1: Overtemperature ΔT

The Overtemperature ΔT Function Allowable Value shall not exceed the following Trip Setpoint by more than [3.8]% of ΔT span.

$$\Delta T \frac{(1+\tau_1 s)}{(1+\tau_2 s)}\left(\frac{1}{1+\tau_3 s}\right) \le \Delta T_0 \left\{K_1 - K_2 \frac{(1+\tau_4 s)}{(1+\tau_5 s)}\left[T \frac{1}{(1+\tau_6 s)} - T'\right] + K_3(P - P') - f_1(\Delta I)\right\}$$

Where: ΔT is measured RCS ΔT, °F.
ΔT_0 is the indicated ΔT at RTP, °F.
s is the Laplace transform operator, sec^{-1}.
T is the measured RCS average temperature, °F.
T′ is the nominal T_{avg} at RTP, ≤ [588]°F.

P is the measured pressurizer pressure, psig
P′ is the nominal RCS operating pressure, ~~≤~~ (≥) [2235] psig

$K_1 \le [1.09]$ $K_2 \ge [0.0138]/°F$ K_3 ~~≥~~ (≥) $[0.000671]/psig$
$\tau_1 \ge [\ 8\ ]$ sec $\tau_2 \le [\ 3\ ]$ sec $\tau_3 \le [\ 2\ ]$ sec
$\tau_4 \ge [\ 33\ ]$ sec $\tau_5 \le [\ 4\ ]$ sec $\tau_6 \le [\ 2\ ]$ sec

$f_1(\Delta I)$ = ~~1.26~~ -[0.0126] {[35] + $(q_t - q_b)$} when $(q_t - q_b) \le -[35]\%$ RTP
0% of RTP when $-[35]\%$ RTP < $(q_t - q_b) \le [7]\%$ RTP
~~-1.05~~ [0.0105] {$(q_t - q_b) - [7]$} when $(q_t - q_b) > [7]\%$ RTP

Where q_t and q_b are percent RTP in the upper and lower halves of the core, respectively, and $q_t + q_b$ is the total THERMAL POWER in percent RTP.