

## Industry/TSTF Standard Technical Specification Editorial Change Traveler

WOG-ED-29

Created on 3/28/2001

Proposed by WOG

TSTF-339, Rev. 2, "Relocate TS Parameters to COLR," proposed changes to the  $f_1(\Delta I)$  equation in Table 3.3.1-1 of NUREG-1431, Rev. 1, based on NRC approval of WCAP-14483, "Generic Methodology for Expanded Core Operating Limits Report."

On March 20, 2001, the chairman of the WOG MERITS Working Group (S. Wideman) received a phone call from the NRC Technical Specification Branch (C. Schulten) concerning the correct presentation of the  $f_1(\Delta I)$  equation with the relocation of the values to the COLR. This information was shared with Westinghouse (licensing contact and author of WCAP-14483) and review of NUREG-1431, Rev. 1, WCAP-14483, and TSTF-339, Rev. 2 was conducted to determine the appropriateness of the revised equation.

Based on this review and how the  $f_1(\Delta I)$  values would be specified in the COLR, it was determined that some editorial changes to the presentation of the equation are appropriate. This information was discussed in a telecon on March 27, 2001 (participants: C. Schulten, B. Tjader, S. Wideman, J. Andrachek). Based on this discussion, it was concluded that an editorial change to the  $f_1(\Delta I)$  equation was appropriate and that it could probably be handled as a WOG editorial change and be incorporated into Rev. 2 of NUREG-1431.

Provided below is a presentation of the  $f_1(\Delta I)$  equation in the various referenced documents and the suggested revision.

### $f_1(\Delta I)$ formula presentation based on NUREG-1431, Rev. 1:

$f_1(\Delta I) = \begin{cases} 1.26 \{35 + (q_t - q_b)\} \\ 0\% \text{ of RTP} \\ -1.05 \{(q_t - q_b) - 7\} \end{cases}$	$\begin{cases} \text{when } q_t - q_b \leq - [35]\% \text{ RTP} \\ \text{when } - [35]\% \text{ RTP} \leq q_t - q_b \leq [7]\% \text{ RTP} \\ \text{when } q_t - q_b > [7]\% \text{ RTP} \end{cases}$
--------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

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.

**NOTE:** TSTF-310 (not yet approved by NRC) modifies the above by:  
 replaces 1.26 with  $[-0.0126]$   
 replaces  $-1.05$  with  $[0.0105]$

Based on incorporation of TSTF-339, Rev. 2 and editorial changes, TSTF-310 will need to be revised to delete the above proposed changes - this will be done at a later date.

### $f_1(\Delta I)$ formula presentation based on TSTF-339, Rev. 2:

$f_1(\Delta I) = \begin{cases} [*] \{[*]\% + (q_t - q_b)\} \\ 0\% \text{ of RTP} \\ -[*] \{(q_t - q_b) - [*]\} \end{cases}$	$\begin{cases} \text{when } q_t - q_b \leq - [*]\% \text{ RTP} \\ \text{when } - [*]\% \text{ RTP} \leq q_t - q_b \leq [*]\% \text{ RTP} \\ \text{when } q_t - q_b > [*]\% \text{ RTP} \end{cases}$
-----------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

3/28/2001

## Industry/TSTF Standard Technical Specification Editorial Change Traveler

WOG-ED-29

Created on 3/28/2001

Proposed by WOG

**Revised Formula:**

$$f_1(\Delta I) = \begin{cases} [*] \{[*]\% - (q_t - q_b)\} & \text{when } q_t - q_b < [*]\% \text{ RTP} \\ 0\% \text{ of RTP} & \text{when } [*]\% \text{ RTP} \leq q_t - q_b \leq [*]\% \text{ RTP} \\ [*] \{(q_t - q_b) - [*]\} & \text{when } q_t - q_b > [*]\% \text{ RTP} \end{cases}$$

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.

The values denoted with [\*] are specified in the COLR.

Affected Pages	Affected NUREGs
3.3-21	NUREG-1431

**Owner's Group Review**

Owner's Group Action: Approved on 3/20/2001

Date Sent to NRC: 3/28/2001

**NRC Review**

NRC Action: No Action Taken

NRC Comments: None

3/28/2001

WOG-ED-29

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

Note 1: Overtemperature  $\Delta T$

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

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

Where:  $\Delta T$  is measured RCS  $\Delta T$ , °F.

$\Delta T_o$  is the indicated  $\Delta T$  at RTP, °F.

$s$  is the Laplace transform operator,  $\text{sec}^{-1}$ .

$T$  is the measured RCS average temperature, °F.

$T'$  is the nominal  $T_{\text{avg}}$  at RTP,  $\leq [588]^\circ\text{F}$ .

$P$  is the measured pressurizer pressure, psig

$P'$  is the nominal RCS operating pressure,  $\leq [2235]$  psig

$$K_1 \leq [1.09]$$

$$K_2 \geq [0.0138]/^\circ\text{F}$$

$$K_3 = [0.000671]/\text{psig}$$

$$\tau_1 \geq [8] \text{ sec}$$

$$\tau_2 \leq [3] \text{ sec}$$

$$\tau_3 \leq [2] \text{ sec}$$

$$\tau_4 \geq [33] \text{ sec}$$

$$\tau_5 \leq [4] \text{ sec}$$

$$\tau_6 \leq [2] \text{ sec}$$

$$f_1(\Delta I) = \begin{cases} 1.26(35 + (q_t - q_b)) & \text{when } q_t - q_b \leq -[35]\% \text{ RTP} \\ 0\% \text{ of RTP} & \text{when } -[35]\% \text{ RTP} < q_t - q_b \leq [7]\% \text{ RTP} \\ -1.05((q_t - q_b) - 7) & \text{when } q_t - q_b > [7]\% \text{ RTP} \end{cases}$$

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.

$$f_1(\Delta I) = \begin{cases} [*] \{[*]\% - (q_t - q_b)\} & \text{when } q_t - q_b < [*]\% \text{ RTP} \\ 0\% \text{ of RTP} & \text{when } [*]\% \text{ RTP} \leq q_t - q_b \leq [*]\% \text{ RTP} \\ [*] \{(q_t - q_b) - [*]\} & \text{when } q_t - q_b > [*]\% \text{ RTP} \end{cases}$$

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.

The values denoted with [\*] are specified in the COLR.