

TABLE 2.2-1

## REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TOTAL ALLOWANCE (TA)	Z	SENSOR ERROR (S)	TRIP SETPOINT	ALLOWABLE VALUE
1. Manual Reactor Trip	N.A.	N.A.	N.A.	N.A.	N.A.
2. Power Range, Neutron Flux					
a. High Setpoint	7.5	4.56	0	$\leq 109\%$ of RTP*	$\leq 112.3\%$ of RTP*
b. Low Setpoint	8.3	4.56	0	$\leq 25\%$ of RTP*	$\leq 28.3\%$ of RTP*
3. Power Range, Neutron Flux, High Positive Rate	2.4	0.5	0	$\leq 4\%$ of RTP* with a time constant $\geq 2$ seconds	$\leq 6.3\%$ of RTP* with a time constant $\geq 2$ seconds
4. Power Range, Neutron Flux, High Negative Rate	2.4	0.5	0	$\leq 4\%$ of RTP* with a time constant $\geq 2$ seconds	$\leq 6.3\%$ of RTP* with a time constant $\geq 2$ seconds
5. Intermediate Range, Neutron Flux	17.0	8.41	0	$\leq 25\%$ of RTP*	$\leq 35.3\%$ of RTP*
6. Source Range, Neutron Flux	17.0	10.01	0	$\leq 10^5$ cps	$\leq 1.6 \times 10^5$ cps
7. Overtemperature $\Delta T$	<del>7.2</del> <del>7.6</del>	3.76	<del>1.55 + 0.9</del> <del>1.73</del> <del>+ 0.67</del>	See Note 1	See Note 2
8. Overpower $\Delta T$	5.5	1.43	<del>0.15</del> <del>0.16</del>	See Note 3	See Note 4
9. Pressurizer Pressure-Low	3.7	0.71	2.49	$\geq 1875$ psig	$\geq 1866$ psig
10. Pressurizer Pressure-High	7.5	0.71	2.49	$\leq 2385$ psig	$\leq 2400$ psig
11. Pressurizer Water Level-High	8.0	2.18	1.96	$\leq 92\%$ of instrument span	$\leq 93.9\%$ of instrument span

\*RTP = RATED THERMAL POWER

\*\*Loop design flow = 95,700 gpm

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

<u>FUNCTIONAL UNIT</u>	<u>TOTAL ALLOWANCE (TA)</u>	<u>Z</u>	<u>SENSOR ERROR (S)</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
12. Reactor Coolant Flow-Low	3.1	<del>2.27</del> 2.19	<del>0.6</del> 0.8	>90% of loop design flow**	>89.1% of loop design flow**
13. Steam Generator Water Level Low-Low	23.5	21.18	2.51	>23.5% of narrow range instrument span	>22.3% of narrow range instrument span
14. Undervoltage - Reactor Coolant Pumps	7.5	1.3	0	>10578 Volts A.C.	>10355 Volts A.C.
15. Underfrequency - Reactor Coolant Pumps	3.3	0	0	>57.2 Hz	>57.1 Hz
16. Turbine Trip					
a. Low Fluid Oil Pressure	N.A.	N.A.	N.A.	>590.00 psig	>534.20 psig
b. Turbine Stop Valve Closure	N.A.	N.A.	N.A.	>1% open	>1% open
17. Safety Injection Input from ESF	N.A.	N.A.	N.A.	N.A.	N.A.

TABLE 2.2-1 (Continued)

TABLE NOTATIONS (Continued)

NOTE 1: (Continued)

$T'$	$\leq$	588.5°F (Nominal $T_{avg}$ at RATED THERMAL POWER);
$K_3$	$=$	0.000671;
$P$	$=$	Pressurizer pressure, psig;
$P'$	$=$	2235 psig (Nominal RCS operating pressure);
$S$	$=$	Laplace transform operator, $s^{-1}$ ;

and  $f_1(\Delta I)$  is a function of the indicated difference between top and bottom detectors of the power-range neutron ion chambers; with gains to be selected based on measured instrument response during plant STARTUP tests such that:

- (i) for  $q_t - q_b$  between -35% and + 7%,  $f_1(\Delta I) = 0$ , where  $q_t$  and  $q_b$  are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and  $q_t + q_b$  is total THERMAL POWER in percent of RATED THERMAL POWER;
- (ii) for each percent that the magnitude of  $q_t - q_b$  exceeds -35%, the  $\Delta T$  Trip Setpoint shall be automatically reduced by 1.26% of its value at RATED THERMAL POWER; and
- (iii) for each percent that the magnitude of  $q_t - q_b$  exceeds +7%, the  $\Delta T$  Trip Setpoint shall be automatically reduced by 1.05% of its value at RATED THERMAL POWER.

NOTE 2: The channel's maximum Trip Setpoint shall not exceed its computed Trip Setpoint by more than ~~3.3%~~ of  $\Delta T$  span.  
2.9%

TABLE 2.2-1 (Continued)TABLE NOTATIONS (Continued)

NOTE 3: (Continued)

$K_6$	=	$0.00128/^{\circ}\text{F}$ for $T > T''$ and $K_6 = 0$ for $T \leq T''$ ;
$T$	=	Average temperature, $^{\circ}\text{F}$ ;
$T''$	=	Indicated $T_{\text{avg}}$ at RATED THERMAL POWER (Calibration temperature for $\Delta T$ instrumentation, $\leq 588.5^{\circ}\text{F}$ );
$S$	=	Laplace transform operator, $s^{-1}$ ; and
$f_2(\Delta I)$	=	0 for all $\Delta I$ .

NOTE 4: The channel's maximum Trip Setpoint shall not exceed its computed Trip Setpoint by more than ~~4.1%~~ of  $\Delta T$  span.  
4.0%