

1. For  $(q_t - q_b)$  within the range between  $\Delta I_1$  and  $\Delta I_2$  given in the table below,  $f(\Delta I) = 0$  (where  $q_t$  and  $q_b$  are percent power in the top and bottom halves of the core respectively, and  $q_t + q_b$  is total core power in percent of rated power).
2. For each percent that  $(q_t - q_b)$  is less than  $\Delta I_1$ , the Delta-T trip setpoint shall be automatically reduced by 4.5% of its value at rated power. For each percent that  $(q_t - q_b)$  is greater than  $\Delta I_2$ , the Delta-T trip setpoint shall be automatically reduced by 2% of its value at rated power.

$\Delta I_1$  and  $\Delta I_2$  are linear functions of the gain  $K_4$ . The proper limits on  $\Delta I_1$  and  $\Delta I_2$  shall be obtained from the following table which gives the allowable values corresponding to the actual value of  $K_4$ .

<u><math>K_4</math></u>	<u><math>\Delta I_1</math></u>	<u><math>\Delta I_2</math></u>
$\leq 1.01$	$\geq -16.0$	$\leq +16$
1.04	$\geq -15.33$	$\leq +14.5$
1.07	$\geq -14.66$	$\leq +13$
1.10	$\geq -14.0$	$\leq +11.5$
1.13	$\geq -13.33$	$\leq +10$
1.16	$\geq -12.66$	$\leq +8.5$
1.19	$\geq -12$	$\leq +7$

(6) Low reactor coolant loop flow:

- (a)  $\geq 90\%$  of normal indicated loop flow
- (b) Low reactor coolant pump frequency -  $\geq 55.0$  cps

(7) Undervoltage -  $\geq 70\%$  of normal voltage

C. Other reactor trips

- (1) High pressurizer water level -  $\leq 92\%$  of span
- (2) Low-low steam generator water level -  $\geq 5\%$  of narrow range instrument span.

The low flow reactor trip protects the core against DNB in the event of a loss of one or two reactor coolant pumps. The undervoltage reactor trip protects the core against DNB in the event of a loss of two or more reactor coolant pumps. The setpoints specified are consistent with the values used in the accident analysis. (8) The low frequency reactor coolant pump trip also protects against a decrease in flow. The specified setpoint assures a reactor trip signal by opening the reactor coolant pump breaker before the low flow trip point is reached, and is consistent with predicted stability of the power grid and the maximum anticipated frequency decay rates (up to 4 Hz/sec) of the system.

The high pressurizer water level reactor trip protects the pressurizer safety valves against water relief. Approximately 1600ft<sup>3</sup> of water (39.75 ft above the lower instrument tap) corresponds to 92% of span. The specified setpoint allows margin for instrument error and transient level overshoot beyond their trip setting so that the trip function prevents the water level from reaching the safety valves.

The low-low steam generator water level reactor trip protects against postulated loss of feedwater accidents. The specified setpoint assures that there will be sufficient water inventory in the steam generators at the time of trip to allow for starting delays for the Auxiliary Feedwater System. (9)

Specified reactor trips are blocked at low power where they are not required for protection and would otherwise interfere with normal plant operation. The prescribed setpoint at which these trips are unblocked assures their availability in the power range where needed.

Above 10% power, an automatic reactor trip will occur if two reactor coolant pumps are lost during operation. Above 60% power, an automatic reactor trip will occur if any pump is lost. This latter trip will prevent the minimum value of the DNB ration, DNBR, from going below 1.30 during normal operational transients and anticipated transients when only three loops are in operation and the overtemperature  $\Delta T$  trip setpoint is adjusted to the value specified for four loop operation. When the overtemperature  $\Delta T$  trip set point is adjusted to the value specified for three loop operation, the trip at 75 per cent power