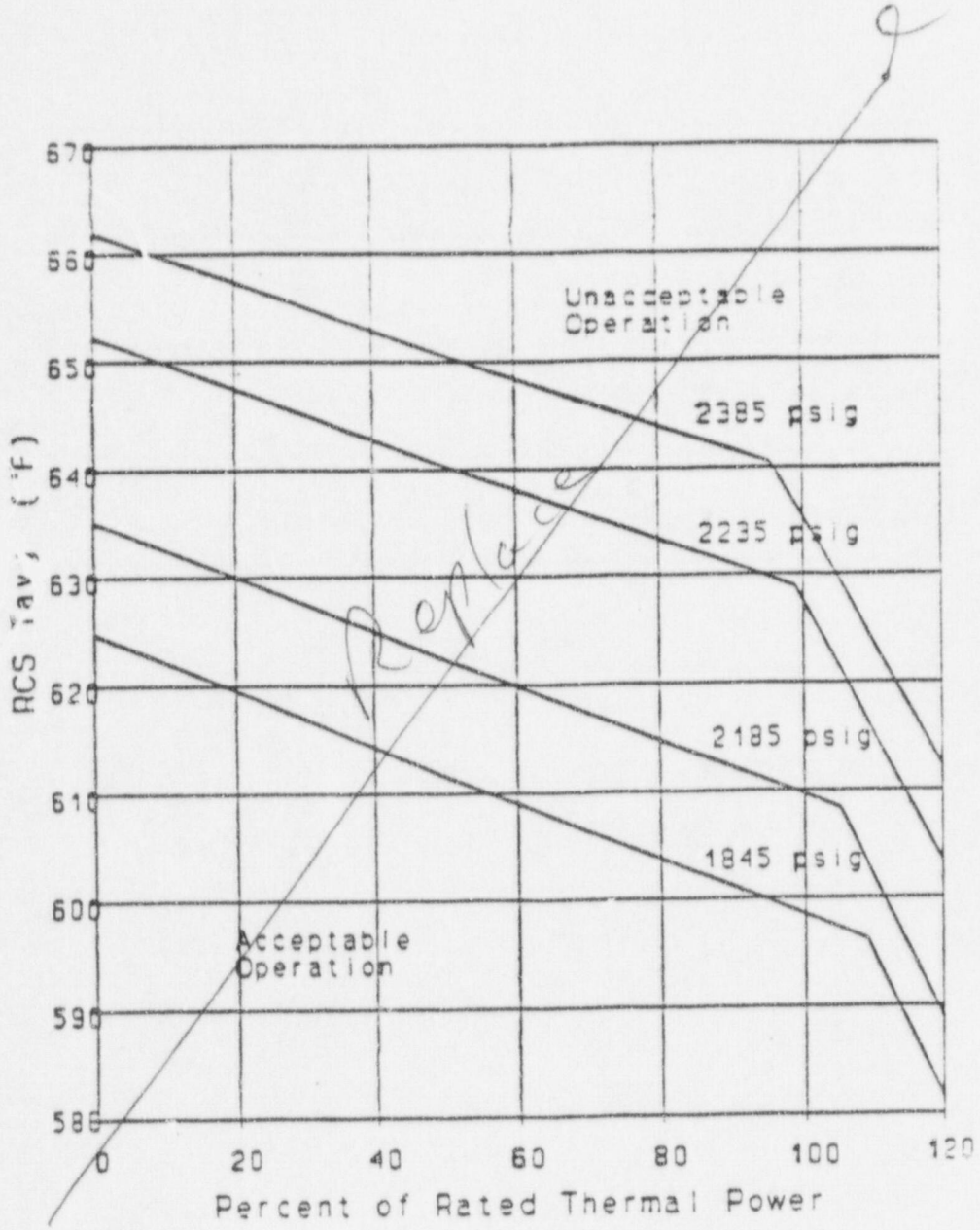

FIGURE 2.1-1b
Unit 2 REACTOR CORE SAFETY LIMITS

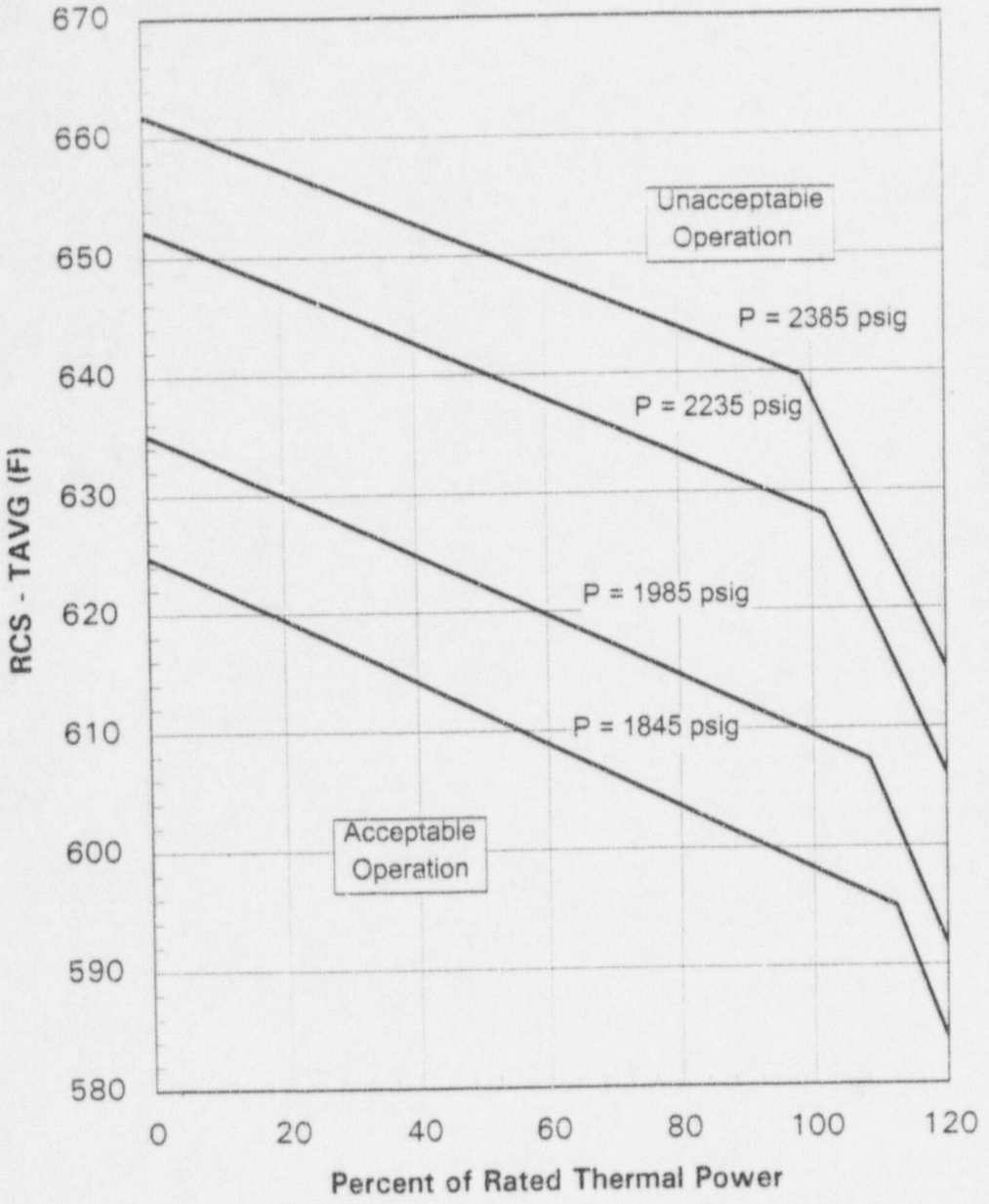

FIGURE 2.1-1b
Unit 2 REACTOR CORE SAFETY LIMITS

TABLE 2.2-1 (Continued)

TABLE NOTATIONS

NOTE 1: Overtemperature N-16

$$\text{~~N~~ } Q_{setpoint} = K_1 - K_2 \left[\frac{1+ \tau_1 S}{1+ \tau_2 S} T_c - T_c^\circ\right] + K_3 (P-P^1) - f_1(\Delta q)$$

Where:

~~N~~ $Q_{setpoint}$ = ~~Measured N-16 Power by ion chambers~~ Overtemperature N-16 trip setpoint.

T_c = Cold leg temperature, °F.

T_c° = 560.5°F for Unit 1, ~~560.8~~ 560.6°F for Unit 2 - Reference T_c at RATED THERMAL POWER.

K_1 = 1.150.

K_2 = 0.0148/°F for Unit 1
~~0.0138~~ 0.0147/°F for Unit 2

$\frac{1+ \tau_1 S}{1+ \tau_2 S}$ = The function generated by the lead-lag controller for T_c dynamic compensation.

τ_1, τ_2 = Time constants utilized in the lead-lag controller for T_c, $\tau_1 \geq 10s$, and $\tau_2 \leq 3s$.

K_3 = = 0.00080/psig for Unit 1
~~0.000720~~ 0.000770/psig for Unit 2

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

NOTE 1: (Continued)

For Unit 2

(I) for $q_t - q_b$ between -65% and ~~+7.5%~~ +5.1%, $f_1(\Delta q) = 0$, 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 -65%, the N-16 Trip Setpoint shall be automatically reduced by 0.0%* of its value at RATED THERMAL POWER, and

(iii) for each percent that the magnitude of $q_t - q_b$ exceeds ~~+7.5%~~ +5.1%, the N-16 Trip Setpoint shall be automatically reduced by ~~2.00%~~ 2.28% of its value at RATED THERMAL POWER.

* No setpoint reduction is required for the span of the ΔI indication.

NOTE 2: The channel's maximum Trip Setpoint shall not exceed its computed Trip Setpoint by more than 1.72% of span for Unit 1 or ~~1.66%~~ 2.82% of span for Unit 2.

ATTACHMENT 4 to TXX-98240

ITS TECHNICAL SPECIFICATION MARKUP

Figure 2.1.1-1 Page 2 of 2
Table 3.3.1-1 Page 8 of 9

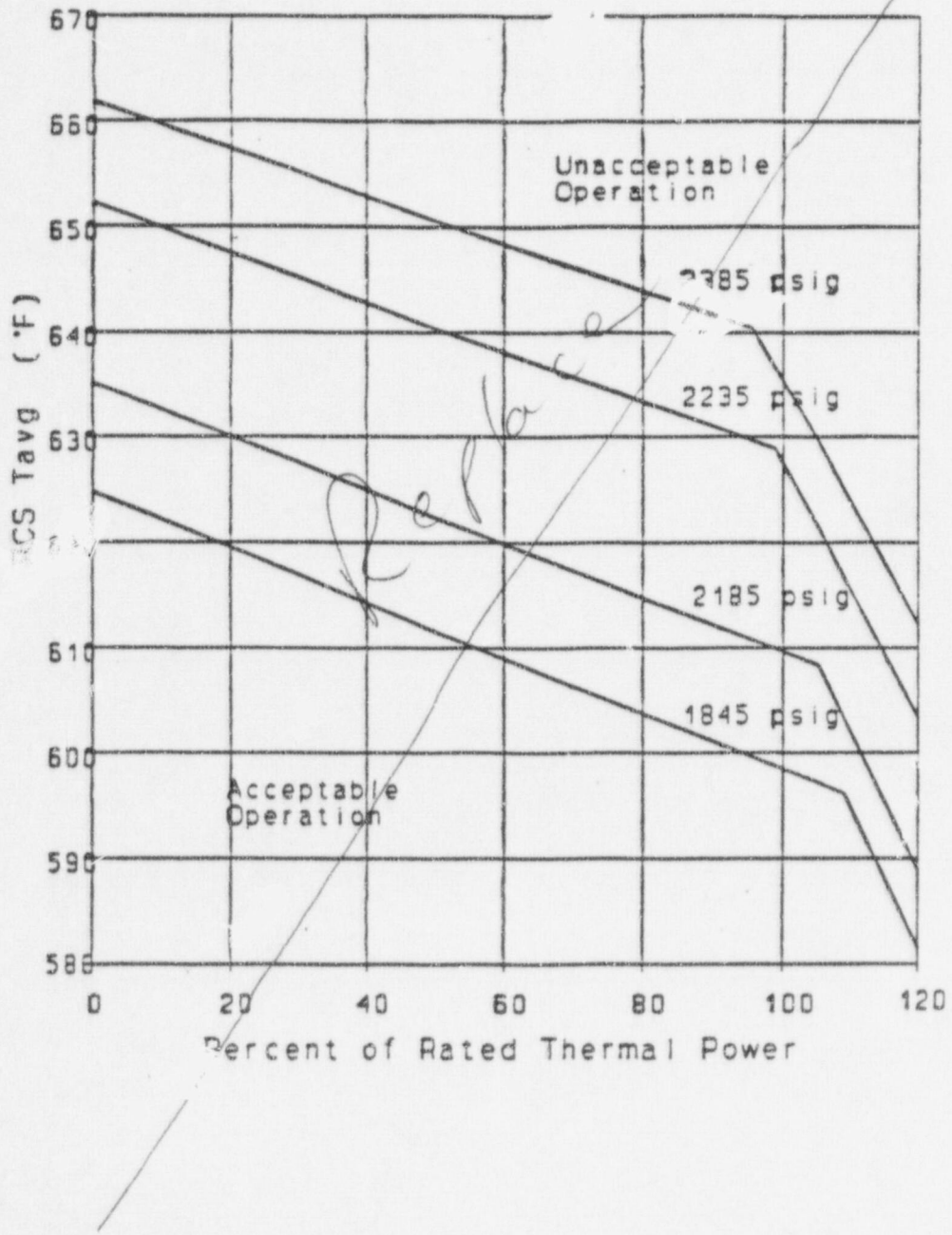

Figure 2.1.1-1 (page 2 of 2)
Reactor Core Safety Limits (Unit 2)

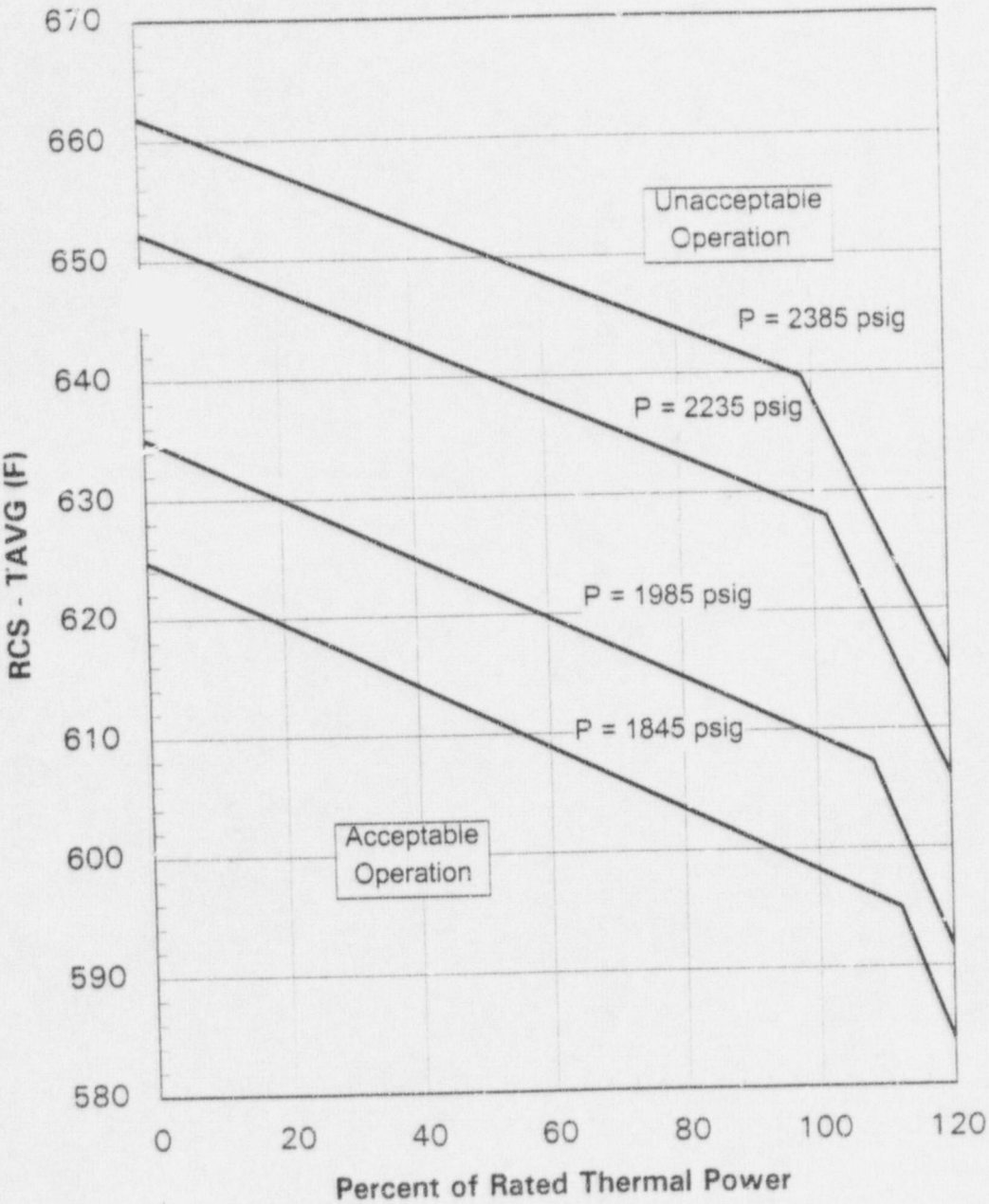

Figure 2.1.1-1 (page 2 of 2)
Reactor Core Safety Limits (Unit 2)

Table 3.3.1-1 (page 8 of 9)
Reactor Trip System Instrumentation

Note 1: Overtemperature N-16

The Overtemperature N-16 Function Allowable Value shall not exceed the following setpoint by more than 1.72% of span for Unit 1, or ~~1.66%~~ 2.82% of span for Unit 2.

$$Qsetpoint = K_1 - K_2 \left[\frac{(1+\tau_1 s)}{(1+\tau_2 s)} T_C - T_C^o \right] + K_3 (P - P^1) - f_1(\Delta q)$$

Where:

~~N~~ $_{setpoint}$ = ~~Measured N-16 Power by ion chambers~~ Overtemperature N-16 trip setpoint

K_1 = 1.150,

K_2 = 0.0148/°F for Unit 1

= ~~0.0138/°F~~ 0.0147/°F for Unit 2

K_3 = 0.00080/psig for Unit 1

= ~~0.000720/psig~~ 0.000770/psig for Unit 2

T_C = Measured cold leg temperature

$T_c°$ = Reference T_C at RATED THERMAL POWER

= 560.5°F for Unit 1

= ~~560.8°F~~ 560.6°F for Unit 2

P = Measured pressurizer pressure, psig

P^1 = Nominal RCS operating pressure

≥ 2235 psig

s = the Laplace transform operator, sec^{-1}.

τ_1 ≥ 10 sec

τ_2 ≤ 3 sec

$f_1(\Delta q)$ =

	$0.00 \cdot \{(q_t - q_b) + 65\%\}$	when $(q_t - q_b) \leq$ -65% RTP
Unit 1:	0%	when -65% RTP < $(q_t - q_b)$ < 5.0% RTP
	$2.15 \cdot \{(q_t - q_b) - 5.0\%\}$	when $(q_t - q_b) \geq$ 5.0% RTP
	$0.0 \cdot \{(q_t - q_b) + 65\%\}$	when $(q_t - q_b) \leq$ -65% RTP
Unit 2:	0%	when -65% RTP < $(q_t - q_b)$ < ~~7.5%~~ 5.1% RTP
	$2.00 \cdot \{(q_t - q_b) -$ ~~7.5%~~ 5.1%$\}$	when $(q_t - q_b) \geq$ ~~7.5%~~ 5.1% RTP