

Figure Index

<u>FIGURE</u>	<u>TITLE</u>	<u>PAGE</u>
2.1-1	Reactor Core Safety Limit - Three Loop Operation	2-2
3.4-1	Dose Equivalent I-131 Primary Coolant Specific Activity Limit Versus Percent of RATED THERMAL POWER with the Primary Coolant Specific Activity > 0.20 $\mu\text{Ci}/\text{gram}$ Dose Equivalent I-131	3/4 4-21
3.4-2	Beaver Valley Unit 1 Reactor Coolant System Heatup Limitations Applicable for the First 16.0 EFY	3/4 4-24
3.4-3	Beaver Valley Unit 1 Reactor Coolant System Cooldown Limitations Applicable for the First 16.0 EFY	3/4 4-25
3.6-1	Maximum Allowable Primary Containment Air Pressure Versus River Water Temperature	3/4 6-7
B 3/4.2-1	Typical Indicated Axial Flux Difference Versus Thermal Power at BOL	B 3/4 2-3
B 3/4.4-1	Fast Neutron Fluence ($E > 1 \text{ Mev}$) as a Function of Full Power Service Life	B 3/4 4-6a
B 3/4.4-2	Effect of Fluence, Copper Content, and Phosphorus Content on ΔRT_{NDT} for Reactor Vessel Steels per Reg. Guide 1.99	B 3/4 4-6b
B 3/4.4-3	Isolated Loop Pressure-Temperature Limit Curve	B 3/4 4-10a

DPR-66
REACTOR COOLANT SYSTEM

SPECIFIC ACTIVITY

LIMITING CONDITION FOR OPERATION

- 3.4.8 The specific activity of the primary coolant shall be limited to:
- a. $\leq 0.20 \mu\text{Ci/gram DOSE EQUIVALENT I-131}$, and
 - b. $\leq 100/\bar{E} \mu\text{Ci/gram}$.

APPLICABILITY: MODES 1, 2, 3, 4 and 5

ACTION:

MODES 1, 2, and 3*

- a. With the specific activity of the primary coolant $> 0.20 \mu\text{Ci/gram DOSE EQUIVALENT I-131}$ for more than 48 hours during one continuous time interval or exceeding the limit line shown on Figure 3.4-1, be in HOT STANDBY with $T_{\text{avg}} < 500^\circ\text{F}$ within 6 hours.
- b. With the specific activity of the primary coolant $> 100/\bar{E} \mu\text{Ci/gram}$, be in HOT STANDBY with $T_{\text{avg}} < 500^\circ\text{F}$ within 6 hours.

MODES 1, 2, 3, 4 and 5

- a. With the specific activity of the primary coolant $> 0.20 \mu\text{Ci/gram DOSE EQUIVALENT I-131}$ or $> 100/\bar{E} \mu\text{Ci/gram}$, perform the sampling and analysis requirement of item 4a of Table 4.4-12 until the specific activity of the primary coolant is restored to within its limits.

SURVEILLANCE REQUIREMENTS

4.4.8 The specific activity of the primary coolant shall be determined to be within the limits by performance of the sampling and analysis program of Table 4.4-12.

* With $T_{\text{avg}} \geq 500^\circ\text{F}$

TABLE 4.4-12PRIMARY COOLANT SPECIFIC ACTIVITY SAMPLE
AND ANALYSIS PROGRAM

<u>TYPE OF MEASUREMENT AND ANALYSIS</u>	<u>MINIMUM FREQUENCY</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
1. Gross Activity Determination	3 times per 7 days with a maximum time of 72 hours between samples.	1, 2, 3, 4
2. Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	1 per 14 days	1,
3. Radiochemical for \bar{E} Determination	1 per 6 months	1,
4. Isotopic Analysis for Iodine Including I-131, I-133, and I-135	a) Once per 4 hours, whenever the specific activity exceeds 0.20 $\mu\text{Ci}/\text{gram}$ DOSE EQUIVALENT I-131 or $100/\bar{E}$ $\mu\text{Ci}/\text{gram}$, and	1#, 2#, 3#, 4#, 5#
	b) One sample between 2 & 6 hours following a THERMAL POWER change exceeding 15 percent of the RATED THERMAL POWER within a one hour period.	1, 2, 3

#Until the specific activity of the primary coolant system is restored within its limits.

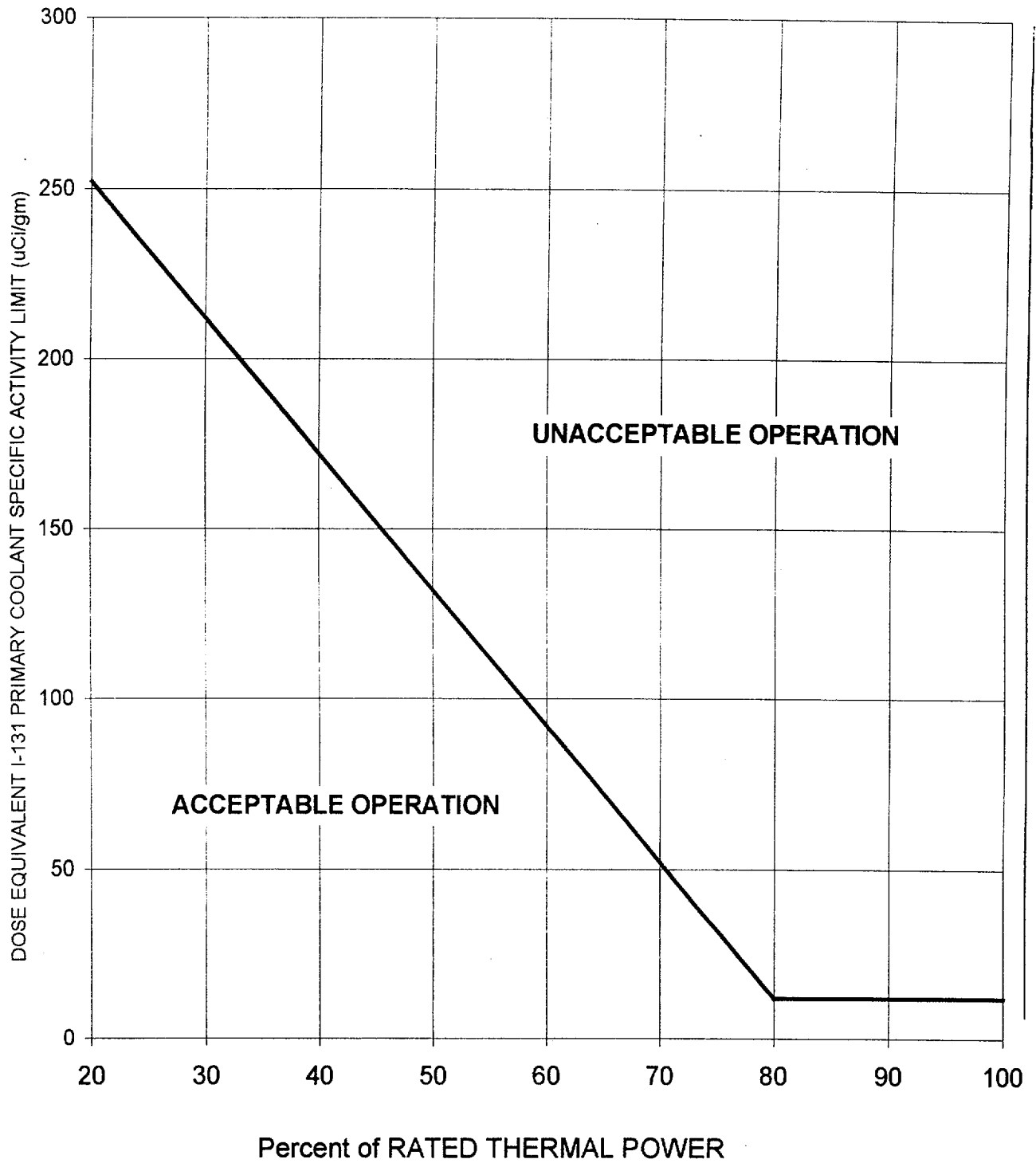


FIGURE 3.4-1
DOSE EQUIVALENT I-131 Primary Coolant Specific Activity Limit
Versus Percent of RATED THERMAL POWER with the Primary
Coolant Specific Activity > 0.20 μ Ci/gram DOSE EQUIVALENT I-131

BASES

3/4.4.7 CHEMISTRY

The limitations on Reactor Coolant System chemistry ensure that corrosion of the Reactor Coolant System is minimized and reduces the potential for Reactor Coolant System leakage or failure due to stress corrosion. Maintaining the chemistry within the Steady State Limits provides adequate corrosion protection to ensure the structural integrity of the Reactor Coolant System over the life of the plant. The associated effects of exceeding the oxygen, chloride and fluoride limits are time and temperature dependent. Corrosion studies show that operation may be continued with contaminant concentration levels in excess of the Steady State Limits, up to the Transient Limits, for the specified limited time intervals without having a significant effect on the structural integrity of the Reactor Coolant System. The time interval permitting continued operation within the restrictions of the Transient Limits provides time for taking corrective actions to restore the contaminant concentrations to within the Steady State Limits.

The surveillance requirements provide adequate assurance that concentrations in excess of the limits will be detected in sufficient time to take corrective action.

3/4.4.8 SPECIFIC ACTIVITY

The primary coolant specific activity is limited in order to maintain offsite and control room operator doses associated with postulated accidents within applicable requirements. Specifically, the 0.20 $\mu\text{Ci/gm}$ DOSE EQUIVALENT I-131 limit ensures that the offsite dose does not exceed a small fraction of 10 CFR Part 100 guidelines and that control room operator thyroid dose does not exceed GDC-19 in the event of primary-to-secondary leakage induced by a main steam line break.

BASES

3/4.4.8 SPECIFIC ACTIVITY (Continued)

The ACTION statement permitting POWER OPERATION to continue for limited time periods with the primary coolant's specific activity $> 0.20 \mu\text{Ci}/\text{gram DOSE EQUIVALENT I-131}$, but within the allowable limit shown on Figure 3.4-1, accommodates possible iodine spiking phenomenon which may occur following changes in THERMAL POWER. Operation with specific activity levels exceeding $0.20 \mu\text{Ci}/\text{gram DOSE EQUIVALENT I-131}$ for more than 48 hours during one continuous time interval or exceeding the limits shown on Figure 3.4-1 must be restricted to ensure that assumptions made in the UFSAR accident analyses are not exceeded.

Reducing T_{avg} to $< 500^\circ\text{F}$ minimizes the release of activity should a steam generator tube rupture since the saturation pressure of the primary coolant is below the lift pressure of the atmospheric steam relief valves. This action also reduces the pressure differential across the steam generator tubes reducing the probability and magnitude of main steam line break accident induced primary-to-secondary leakage. The surveillance requirements provide adequate assurance that excessive specific activity levels in the primary coolant will be detected in sufficient time to take corrective action. Information obtained on iodine spiking will be used to assess the parameters associated with spiking phenomena. A reduction in frequency of isotopic analyses following power changes may be permissible if justified by the data obtained.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS

All components in the Reactor Coolant System are designed to withstand the effects of cyclic loads due to system temperature and pressure changes. These cyclic loads are introduced by normal load transients, reactor trips, and startup and shutdown operations. The various categories of load cycles used for design purposes are provided in Section 4.1.4 of the FSAR. During startup and shutdown, the rates of temperature and pressure changes are limited so that the maximum specified heatup and cooldown rates are consistent with the design assumptions and satisfy the stress limits for cyclic operation.

During heatup, the thermal gradients in the reactor vessel wall produce thermal stresses which vary from compressive at the inner wall to tensile at the outer wall. These thermal-induced compressive stresses tend to alleviate the tensile stresses induced by the internal pressure. Therefore, a pressure-temperature curve based on steady state conditions (i.e., no thermal stresses) represents a lower bound of all similar curves for finite heatup rates when the inner wall of the vessel is treated as the governing location.