Attachment 3
Edited Technical Specifications Pages

15.1-6
15.2.2-1
15.3.1-9
15.3.1-10
Figure 15.3.1-5
15.3.4-2
15.3.4-3
Table 15.4.1-2 page 1 of 4
Table 15.4.1-2 page 2 of 4
15.5.3-3
15.6.9-3

o. Dose Equivalent I-131

Dose Equivalent I-131 shall be that concentration of I-131 (microcurie/gram) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in ~~Table III of TID-14844, "Calculation of Distance Factors for Power and Test Reactor Sites."~~ Table 2.1 of Federal Guidance Report No. II, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion," September 1988.

p. $\bar{E}$ - Average Disintegration Energy

$\bar{E}$ shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MeV) for isotopes, other than iodines, with half lives greater than 15 minutes, making up at least 95% of the total non-iodine activity in the coolant.

15.2.2 SAFETY LIMIT, REACTOR COOLANT SYSTEM PRESSURE

Applicability

Applies to the maximum limit on Reactor Coolant System Pressure.

Objective

To maintain the integrity of the Reactor Coolant System.

Specification

The Reactor Coolant System pressure shall not exceed 2735 psig with fuel assemblies installed in the reactor vessel.

Basis

The Reactor Coolant System[1] serves as a barrier preventing radionuclides contained in the reactor coolant from reaching the atmosphere. In the event of a fuel cladding failure the Reactor Coolant System is the primary barrier against the release of fission products. By establishing a system pressure limit, the continued integrity of the Reactor Coolant System is assured. The maximum transient pressure allowable in the Reactor Coolant System pressure vessel under the ASME Code, Section III is 110% of design pressure. The maximum transient pressure allowable in the Reactor Coolant System piping, valves and fittings under USAS Section B31.1 is 120% of design pressure. Thus, the safety limit of 2735 psig (110% of design pressure) has been established.[2]

The nominal settings of the power-operated relief valves (2335 psig), the reactor high-pressure trip ~~(2385 psig)~~ and the safety valves (2485 psig) have been established to assure never reaching the Reactor Coolant System pressure safety limit. The initial hydrostatic test was conducted at 3110 psig to assure the integrity of the Reactor Coolant System.

Reference

(1) FSAR, Section 4

(2) FSAR, Section 4.3

C. MAXIMUM COOLANT ACTIVITY

Specification:

The specific activity of the reactor coolant shall be limited to:

1. Less than or equal to ~~1.0~~ 0.8 microcurie per gram Dose Equivalent I-131.
   a. If the specific activity of the reactor coolant is greater than ~~1.0~~ 0.8 microcuries per gram Dose Equivalent I-131 but within the allowable limit (below and to the left of the line) shown on Figure 15.3.1-5, operation may continue for up to 48 hours. Reactor coolant sampling shall be in accordance with Table 15.4.1-2.
   b. If the specific activity of the reactor coolant is greater than ~~1.0~~ 0.8 microcuries per gram Dose Equivalent I-131 for more than 48 hours during one continuous time interval or exceeds the allowable limit (above and to the right of the line) shown on Figure 15.3.1-5, the reactor will be shut down and the average reactor coolant temperature will be less than $500^{O}F$ within 6 hours.
2. Less than or equal to $100/\bar{E}$ microcuries per gram.
   a. If the specific activity of the reactor coolant is greater than $100/\bar{E}$ microcuries per gram, the reactor will be shut down and the average reactor coolant temperature will be less than $500^{O}F$ within 6 hours. Reactor coolant sampling shall be in accordance with Table 15.4.1-2.

Basis:

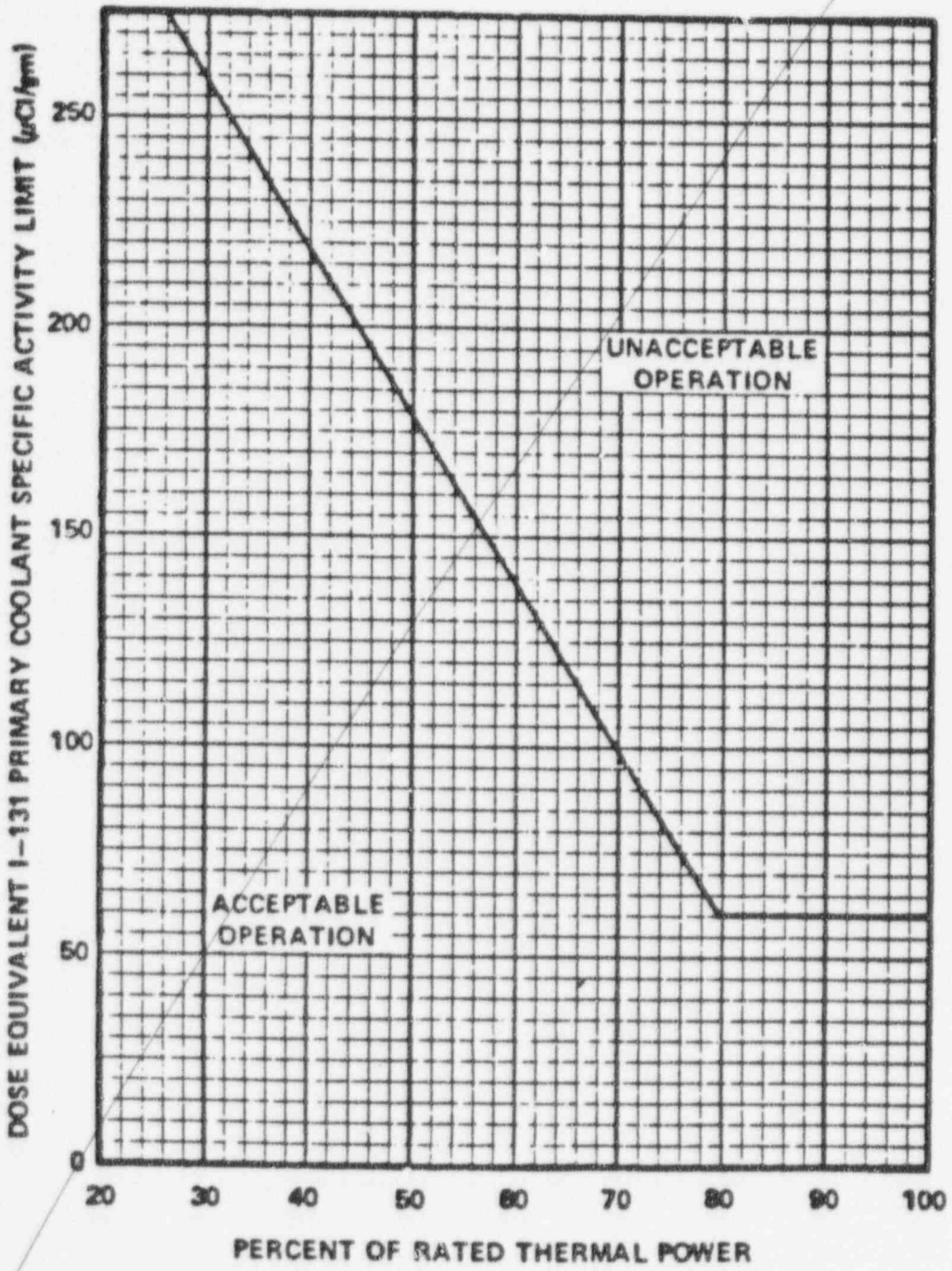
The limitations on the specific activity of the reactor coolant ensure that the resulting 2-hour doses at the site boundary will not exceed an appropriately small fraction of Part 100 limits following a steam generator tube rupture accident in conjunction with an assumed steady state primary-to-secondary steam generator leakage rate of 500 gpd in either steam generator. The values for the limits on specific activity represent limits based upon a parametric evaluation by the NRC of typical site locations. These values are conservative for Point Beach Nuclear Plant.

Continued power operation for limited time periods with the reactor coolant's specific activity greater than ~~1.0~~ 0.8 microcurie/gram Dose Equivalent I-131, but within the allowable limit shown on Figure 15.3.1-5, accommodates possible iodine spiking phenomenon which may occur following changes in thermal power. Operation with specific activity levels exceeding ~~1.0~~ 0.8 microcurie/gram Dose Equivalent I-131 but within the limits shown on Figure 15.3.1-5 increase the 2-hour thyroid dose at the site boundary by a factor of up to 20 following a postulated steam generator tube rupture.

Reducing T_{avg} to less than $500^{O}F$ normally prevents the release of activity should a steam generator tube rupture since the saturation pressure of the reactor coolant is below the lift pressure of the atmospheric steam relief valves. 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. A reduction in frequency of isotopic analyses following power changes may be permissible if justified by the data obtained.

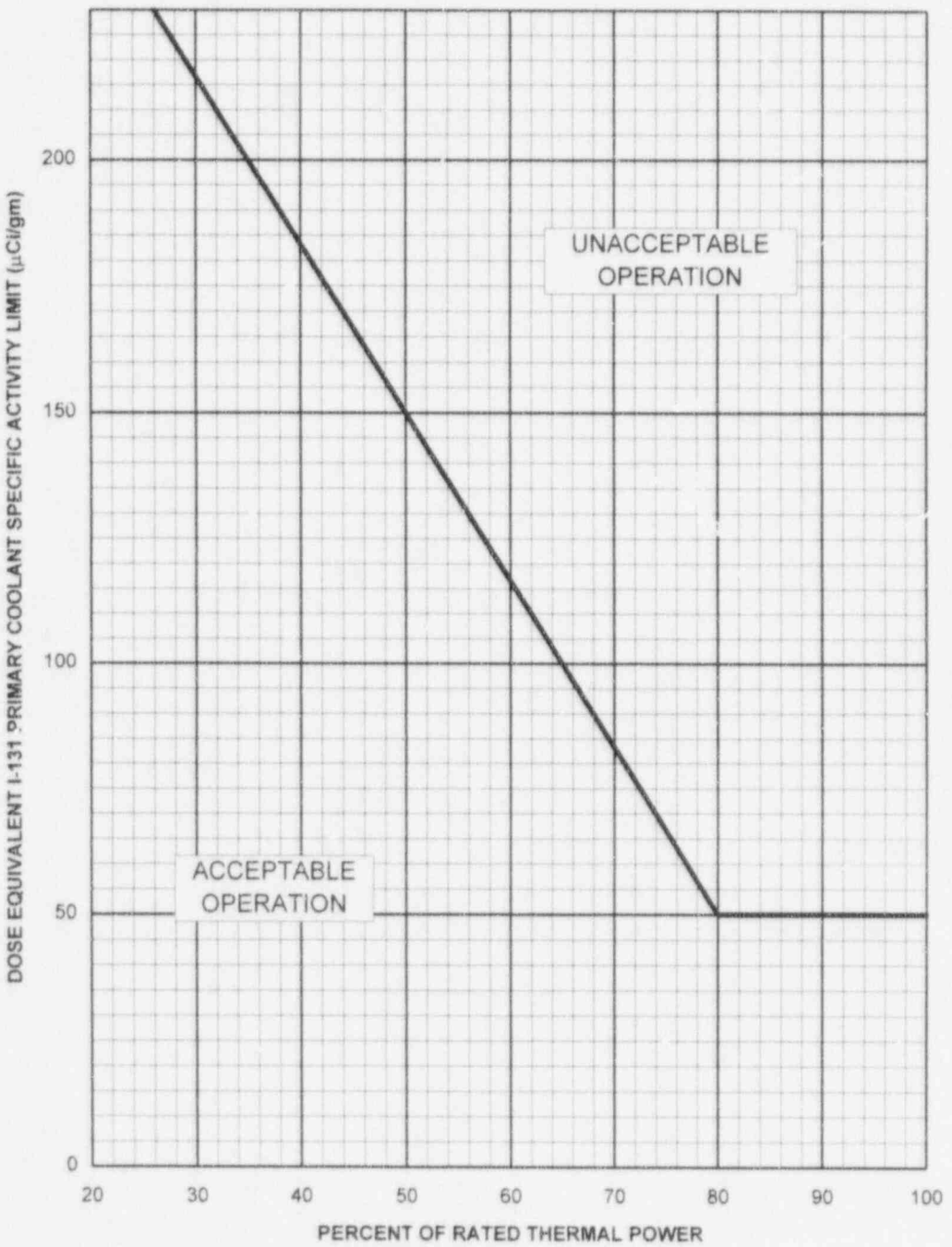
FIGURE 15.3.1-5

Replace with New Figure.



DOSE EQUIVALENT I–131 Primary Coolant Specific Activity Limit Versus Percent of RATED THERMAL POWER with the Primary Coolant Specific Activity > 1.0 μCi/gram Dose Equivalent I-131

FIGURE 15.3.1-5



DOSE EQUIVALENT I-131 Primary Coolant Specific Activity Limit Versus Percent of RATED THERMAL POWER with the Primary Coolant Specific Activity > 0.8 µCi/gm Dose Equivalent I-131

3. A minimum of 13,000 gallons of water per operating unit in the condensate storage tanks and an unlimited water supply from the lake via either leg of the plant Service Water System.

4. System piping and valves required to function during accident conditions directly associated with the above components operable.

5. Both atmospheric steam dump lines shall be operable. If either of the atmospheric steam dump lines is determined to be inoperable, restore the inoperable line to an operable status within 24 hours. If operability cannot be restored, be in hot shutdown within six hours and cold shutdown within 24 hours.

B. The dose equivalent ~~iodine~~I-131 activity on the secondary side of the steam generator shall not exceed ~~1.2~~ 1.0 μCi/~~cc~~g.

C. During power operation the requirements of 15.3.4.A.2.a and b may be modified to allow the following components to be inoperable for a specified time. If the system is not restored to meet the requirements of 15.3.4.A.2.a and b within the time period specified, the specified action must be taken. If the requirements of 15.3.4.A.2.a and b are not satisfied within an additional 48 hours, the appropriate reactor(s) shall be cooled down to less than 350^{O}F.

1. Two Unit Operation - One of the four operable auxiliary feedwater pumps may be out-of-service for the below specified times: A turbine driven auxiliary feedwater pump may be out of service for up to 72 hours. If the turbine driven auxiliary feedwater pump cannot be restored to service within the 72 hour time period the associated reactor shall be in hot shutdown within the next 12 hours. A motor driven auxiliary feedwater pump may be out of service for up to 7 days. If the inoperable motor driven auxiliary feedwater pump cannot be restored to service within the 7 day time period both of the reactors shall be in hot shutdown within the next 12 hours.

For the purposes of determining a maximum allowable secondary coolant activity, the steam break accident is based on a postulated release of the contents of one steam generator to the atmosphere using a site boundary dose limit. The limiting dose for this accident results from iodine in the secondary coolant. I-131 is the dominant isotope because of its low ~~MPC in air~~ derived air concentration and because the other iodine isotopes have shorter half-lives and therefore cannot buildup to significant concentrations in the secondary coolant, given the limitations on primary system leak rate and activity. It is assumed that the accident occurs at zero load, which is when the maximum amount of water is contained in one steam generator. One tenth of the contained iodine is assumed to reach the site boundary, making allowance for plate-out and retention in water droplets. It is conservative to measure gross beta-gamma activity except when the gross activity exceeds or equals ~~1.2~~ 1.0 µCi/~~cc~~g. At this time the iodine-131 activity must be measured.

The maximum inhalation dose at the site boundary is then as follows:

$$\text{Dose (rem)} = \frac{C \times V}{10} \times B(t) \times \frac{\chi}{Q} \times DCF$$

where:

C = secondary coolant activity (~~1.2~~ 1.0 µCi/~~cc~~g = ~~1.2~~ 0.001 Ci/~~m~~^{3}kg)

V = water ~~volume~~ mass in one steam generator
~~(2821 ft^3 = 80 m^3)~~ (2877 ft^3 ≈ 62,250 kg)

B(t) = breathing rate (3.47×10^{-4} m^3/sec)

χ/Q = ~~3.0~~ 5.0 x 10^{-4} sec/m^3 (4)

DCF = ~~1.48~~ 1.07 x 10^6 rem/Ci I-131 inhaled

The resultant dose is ~~slightly less than~~ approximately ~~1.5~~ 1.2 rem.

References:
FSAR Section 10
FSAR Section 14

TABLE 15.4.1-2

MINIMUM FREQUENCIES FOR EQUIPMENT AND SAMPLING TESTS

		Test	Frequency
1.	Reactor Coolant Samples	Gross Beta-gamma activity (excluding tritium)	5/week[7]
		Tritium activity	Monthly
		Radiochemical $\bar{E}$ Determination	Semiannually [2][10]
		Isotopic Analysis for Dose Equivalent I-131 Concentration	Every two weeks[1]
		Isotopic Analysis for Iodine including I-131, I-133, and I-135	a.) Once per 4 hours whenever the specific activity exceeds ~~1.0~~ 0.8 μCi/gram Dose Equivalent I-131 or $100/\bar{E}$ μCi/gram.[6] b.) One sample between 2 and 6 hours following a thermal power change exceeding 15% of rated power in a one-hour period.
		Chloride Concentration	5/week[8]
		Diss. Oxygen Conc.	5/week[6]
		Fluoride Conc.	Weekly
2.	Reactor Coolant Boron	Boron Concentration	Twice/week
3.	Refueling Water Storage Tank Water Sample	Boron Concentration	Weekly[6]
4.	Boric Acid Tanks	Boron Concentration	Twice/week and after each BAST concentration change when they are being relied upon as a source of borated water.
5.	Spray Additive Tank	NaOH Concentration	Monthly
6.	Accumulator	Boron Concentration	Monthly

TABLE 15.4.1-2 (Continued)

		Test	Frequency
7.	Spent Fuel Pit	a) Boron Concentration b) Water Level Verification	Monthly Weekly
8.	Secondary Coolant	Gross Beta-gamma Activity or gamma isotopic analysis	Weekly[6]
		Iodine concentration	Weekly when gross Beta-gamma activity equals or exceeds ~~1.2~~ 1.0 µCi/~~cc~~g [6]
9.	Control Rods	a) Rod drop times of all full length rods [3]	Each refueling or after maintenance that could affect proper functioning [4]
		b) Rodworth measurement	Following each refueling shutdown prior to commencing power operation
10.	Control Rod	Partial movement of all rods	Every 2 weeks [18]
11.	Pressurizer Safety Valves	Set point	Every five years [11]
12.	Main Steam Safety Valves	Set Point	Every five years [11]
13.	Containment Isolation Trip	Functioning	Each refueling shutdown
14.	Refueling System Interlocks	Functioning	Each refueling shutdown
15.	Service Water System	Functioning	Each refueling shutdown
16.	Primary System Leakage	Evaluate	Monthly [6]
17.	Diesel Fuel Supply	Fuel inventory	Daily
18.	Turbine Stop and Governor Valves	Functioning	Annually [6]
19.	Low Pressure Turbine Rotor Inspection [5]	Visual and magnetic particle or liquid penetrant	Every five years
20.	Boric Acid System	Storage Tank and piping temperatures ≥ temperature required by Table 15.3.2-1	Daily[19]

a. The design seismic ground acceleration, 0.06g, acting in the horizontal and 0.04g acting in the vertical planes simultaneously, with stresses maintained within code allowable working stresses.

b. The maximum potential seismic ground acceleration, 0.12g, acting in the horizontal and 0.08g acting in the vertical planes simultaneously with no loss of function.

3. ~~The nominal liquid volume of the Reactor Coolant System, at rated operating conditions, is 6040 cubic feet.~~

The nominal Reactor Coolant System volume (both liquid and steam) at rated operating conditions and zero percent steam generator tube plugging is:

Unit 1 - 6500 ft^3

Unit 2 - 6643 ft^3

References

(1) FSAR Section 3.2.3

~~(2) FSAR Section 3.2.1~~

~~(3) FSAR Section 3.2.3~~

(4) FSAR Section 3.2.3

~~(5) FSAR Sections 3.2.1 & 3.2.3~~

(6) FSAR Table 4.1-9

e. Reactor coolant activity

The results of specific activity analysis in which the primary coolant exceeded the limits of Specification 15.3.1.C. The following information shall be included:

1. Reactor power history starting 48 hours prior to the first sample in which the activity limit was exceeded;
2. Results of the last isotopic analysis for radioiodine analysis prior to exceeding the limit, results of analysis while limit was exceeded and results of one analysis after the radioiodine activity was reduced to less then the limit. Each result should include the date and time of sampling and the radioiodine concentrations;
3. Clean-up flow history starting 48 hours prior to the first sample in which the activity limit was exceeded,
4. Graph of the I-131 concentration and one other radioiodine isotope concentration in microcuries per gram as a function of time for the duration of the specific activity above the steady state level; and
5. The time duration when the specific activity of the primary coolant exceeded ~~1.0~~ 0.8 microcuries per gram DOSE EQUIVALENT I-131.

C. Monthly Operating Reports

1. Routine reports of operating statistics and shutdown experience shall be submitted on a monthly basis under the titles "Operating Data Report", "Average Daily Power Levels" and "Unit Shutdowns" and "Power Reduction". In addition, the report shall contain a narrative summary of operating experience that describes the operation of the facility, including major safety-related maintenance for the monthly report period.

2. Completed reports shall be sent by the tenth of each month following the calendar month covered by the report.