

LIMITING CONDITIONS FOR OPERATION  
3.6.B Coolant Chemistry

1. Coolant Activity Limits

Whenever the reactor is critical, the limits on activity concentrations in the reactor coolant shall not exceed the equilibrium value of 0.2 uc/gm of dose equivalent \*I-131.

This limit may be exceeded for a maximum of 48 hours. During this activity transient the iodine concentration shall not exceed the equilibrium values of 4.0 uc/gram of dose equivalent I-131 whenever the reactor is critical. The reactor shall not be operated under this exception from the equilibrium activity limits for more than 800 hours in any consecutive 12 month period. If the iodine concentration in the coolant exceeds 0.2 uc/gram dose equivalent I-131 for more than 48 continuous hours or is greater than 4.0 uc/gm dose equivalent I-131, the reactor shall be shutdown, and the steam line isolation valves shall be closed within 12 hours.

\*That concentration I-131 which alone would produce the same thyroid dose as the quantity and isotopic mixture actually present.

\*\*The following definition will apply to the term significant increase in offgas level.

- a) At release rates less than or equal to 75,000 uc/sec significant increase means an increase of 10,000 uc/sec from the previous corresponding power level steady state release rate within 1 hour.
- b) At release rates greater than 75,000 uc/sec significant increase means an increase of 15% from the previous corresponding power level steady state release rate within 1 hr.

SURVEILLANCE REQUIREMENTS  
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1. During the equilibrium power operation the sampling frequencies of Table I shall apply. Additional samples shall be taken whenever the reactor coolant concentration exceeds ten percent of the equilibrium value in 3.6.B.1 and one or more of the following conditions are met:

- a. During startup
- b. Following a significant power change\*\*\*
- c. Following a significant increase\*\* in the equilibrium offgas level at the steam air ejector over a 1 hour period.

Additional samples will also be obtained whenever the equilibrium iodine concentration limit of 3.6.B.1 is exceeded.

The additional coolant liquid samples shall be taken at 4 hour intervals for 48 hours, or until two successive samples indicate a decreasing trend below the limiting value of 0.2 uc/gm dose equivalent I-131. However, at least 3 consecutive samples shall be taken in all cases.

A gross iodine measurement shall be performed on all samples. If this measurement exceeds 0.2 uc/gm an isotopic analysis to determine dose equivalent I-131 shall be performed.

\*\*\*For the purpose of this section on sampling frequency a significant power change is defined as a change exceeding 15% of rated power in less than 1 hour.

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TABLE I

<u>Location</u>	<u>Measurement</u>	<u>Frequency</u>
Stack gas	Gross activity	Continuous
Off-gas sample at SJAE	Isotopic analysis - including quantitative measurements for at least Xe-133, Xe-135, and Kr-88.	Monthly
Steam Line	Gross activity	Continuous
Coolant liquid sample	a) Isotopic analysis including quantitative measurements for at least I-131, I-132, I-133, and I-135	Monthly (when off-gas release rate at steam air ejector exceeds 75,000 uc/sec)
	b) Quantitative measurements for I-131, I-132, I-133, & I-135	Weekly

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2. The following limits shall be observed for reactor water quality prior to any startup and when operating at rated pressure:
  - a) Conductivity 5.0 umho/cm at 25° C
  - b) Chloride concentration 0.2 ppm
  
3. Reactor water quality may exceed the limits of Specification 3.6.B.2 only for the time limits specified below. If these time limits or the maximum quality limits specified are exceeded, the unit shall be placed in Hot Shutdown within 12 hours and in Cold Shutdown within 36 hours, unless a safety analysis, approved by PORC and O&SR Committee, has confirmed that the higher impurity levels will not damage primary system materials.
  - a) Conductivity at 25° C
 

Time above 5 umho/cm	2 weeks/year
Maximum limit	10 umhos/cm

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2. A sample of reactor coolant be analyzed:
  - a) At least every 4 days at steaming rates above 100,000 pounds per hour for conductivity and chloride ion content.
  - b) At least every day during startups and at steaming rates below 100,000 pounds per hour for conductivity and chloride ion content.
  - c) At least every 4 hours during startups and at steaming rates below 100,000 pounds per hour for chloride ion content if the conductivity is above 0.5 umho/cm or if it increases at a rate of 0.2 umho/cm/hr or more.
  - d) At least once every week for total iodine concentration when the air ejector offgas monitor indicates that the stack release rate would be in excess of 100,000 uci/sec assuming a 30 min. holdup.

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b) Chloride Concentration

Time above 2 weeks/year  
0.2 ppm

Maximum limit 1.0 ppm

c) pH

During operations, if the conductivity exceeds 1.0 umho/cm, pH shall be measured and brought within the 5.6 to 8.6 range within 24 hours. If the pH cannot be corrected, or if the pH is outside a range of 4 to 10, the unit shall be placed in Hot Shutdown within 12 hours and in Cold Shutdown within 36 hours.

C. Coolant Leakage

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1. Any time irradiated fuel is in the reactor vessel and reactor coolant temperature is above 212 degrees F, the rate of reactor coolant leakage to the primary containment from unidentified sources shall not exceed 5 gallons per minute. The rate change of unidentified leakage shall not exceed 2 gallons per minute per 24 hour surveillance period. In addition, the total reactor coolant system leakage into the primary containment shall not exceed 25 gpm averaged over any 24 hour period.

1. Reactor coolant system leakage shall be checked by the sump pump and air sampling system and recorded every 4 hours or less.

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2. Both the sump and air sampling systems shall be operable during reactor power operation. From and after the date that one of these systems is made or found to be inoperable for any reason, reactor power operation is permissible only during the succeeding seven days unless the system is made operable sooner.
3. If the conditions in 1 or 2 cannot be met, an orderly shutdown shall be initiated and the reactor shall be in Cold Shutdown Condition within 24 hours.