

CONTAINMENT SYSTEM

3/4.6.5 ICE CONDENSER

ICE BED

LIMITING CONDITION FOR OPERATION

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3.6.5.1 The ice bed shall be OPERABLE with:

- a. The stored ice having a boron concentration of at least 1800 ppm (the boron being in the form of sodium tetraborate), and a pH of 9.0 to 9.5 at 25°C,
- b. Flow channels through the ice condenser,
- c. A maximum ice bed temperature of  $\leq 27^{\circ}\text{F}$ ,
- d. Each ice basket containing at least 1220 lbs of ice, and
- e. 1944 ice baskets.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the ice bed inoperable, restore the ice bed to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

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3.6.5.1 The ice condenser shall be determined OPERABLE:

- a. At least once per 12 hours by using the ice bed temperature monitoring system to verify that the maximum ice bed temperature is  $\leq 27^{\circ}\text{F}$ .
- b. At least once per 9 months by:
  1. Chemical analyses which verify that at least 9 representative samples of stored ice have a boron concentration of at least 1800 ppm (the boron being in the form of sodium tetraborate), and a pH of 9.0 to 9.5 at 25°C.
  2. Weighing a representative sample of at least 144 ice baskets and verifying that each basket contains at least 1220 lbs of ice. The representative sample shall include 6 baskets from each of the 24 ice condenser bays and shall be

## CONTAINMENT SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

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constituted of one basket each from Radial Rows 1, 2, 4, 6, 8 and 9 (or from the same row of an adjacent bay if a basket from a designated row cannot be obtained for weighing) within each bay. If any basket is found to contain less than 1220 pounds of ice, a representative sample of 20 additional baskets from the same bay shall be weighed. The minimum average weight of ice from the 20 additional baskets and the discrepant basket shall not be less than 1220 pounds/basket at a 95% level of confidence.

The ice condenser shall also be subdivided into 3 groups of baskets, as follows: Group 1 - bays 1 through 8, Group 2 - bays 9 through 16, and Group 3 - bays 17 through 24. The minimum average ice weight of the sample baskets from Radial Rows 1, 2, 4, 6, 8 and 9 in each group shall not be less than 1220 pounds/basket at a 95% level of confidence.

The minimum total ice condenser ice weight at a 95% level of confidence shall be calculated using all ice basket weights determined during this weighing program and shall not be less than 2,371,450 pounds.

3. Verifying, by a visual inspection of at least two flow passages per ice condenser bay, that the accumulation of frost or ice on flow passages between ice baskets, past lattice frames, through the intermediate and top deck floor grating, or past the lower inlet plenum support structures and turning vanes is restricted to a nominal thickness of 3/8 inches. If one flow passage per bay is found to have an accumulation of frost or ice greater than this thickness, a representative sample of 20 additional flow passages from the same bay shall be visually inspected. If these additional flow passages are found acceptable, the surveillance program may proceed considering the single deficiency as unique and acceptable. More than one restricted flow passage per bay is evidence of abnormal degradation of the ice condenser.
- c. At least once per 40 months by lifting and visually inspecting the accessible portions of at least two ice baskets from each 1/3 of the ice condenser and verifying that the ice baskets are free of detrimental structural wear, cracks, corrosion or other damage. The ice baskets shall be raised at least 12 feet for this inspection.

## CONTAINMENT SYSTEMS

### ICE BED TEMPERATURE MONITORING SYSTEM

#### LIMITING CONDITION FOR OPERATION

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3.6.5.2 The ice bed temperature monitoring system shall be OPERABLE with at least 2 OPERABLE RTD channels in the ice bed at elevations 652' 2-1/4", 672' 5-1/4" and 696' 2-1/4" for each one third of the ice condenser.

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

#### ACTION:

- a. With the ice bed temperature monitoring system inoperable, POWER OPERATION may continue for up to 30 days provided:
  1. The ice compartment lower inlet doors, intermediate deck doors, and top deck doors are closed;
  2. The last recorded mean ice bed temperature was  $\leq 20^{\circ}\text{F}$  and steady; and
  3. The ice condenser cooling system is OPERABLE with at least:
    - a) 21 OPERABLE air handling units,
    - b) 2 OPERABLE glycol circulating pumps, and
    - c) 3 OPERABLE refrigerant units;

otherwise, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With the ice bed temperature monitoring system inoperable and with the ice condenser cooling system not satisfying the minimum components OPERABILITY requirements of a.3 above, POWER OPERATION may continue for up to 6 days provided the ice compartment lower inlet doors, intermediate deck doors, and top deck doors are closed and the last recorded mean ice bed temperature was  $\leq 15^{\circ}\text{F}$  and steady; otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

## CONTAINMENT SYSTEMS

### ICE CONDENSER DOORS

#### LIMITING CONDITION FOR OPERATION

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4.6.5.3 The ice condenser inlet doors, intermediate deck doors, and top deck doors shall be closed and OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

#### ACTION:

With one or more ice condenser doors open or otherwise inoperable, POWER OPERATION may continue for up to 14 days provided the ice bed temperature is monitored at least once per 4 hours and the maximum ice bed temperature is maintained  $\leq 27^{\circ}\text{F}$ ; otherwise, restore the doors to their closed positions or OPERABLE status (as applicable) within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

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4.6.5.3.1 Inlet Doors - Ice condenser inlet doors shall be:

- a. Continuously monitored and determined closed by the inlet door position monitoring system, and
- b. Demonstrated OPERABLE during shutdown (MODES 5 and 6) at least once per 9 months by:
  1. Verifying that the torque required to initially open each door is  $\leq 675$  inch pounds.
  2. Verifying that opening of each door is not impaired by ice, frost or debris.
  3. Testing a sample of at least 50% of the doors and verifying that the torque required to open each door is less than 195 inch-pounds when the door is 40 degrees open. this torque is defined as the "door opening torque" and is equal to the nominal door torque plus a frictional torque component.

## CONTAINMENT SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

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The doors selected for determination of the "door opening torque" shall be selected to ensure that all doors are tested at least once during two test intervals.

4. Testing a sample of at least 50% of the doors and verifying that the torque required to keep each door from closing is greater than 78 inch-pounds when the door is 40 degrees open. This torque is defined as the "door closing torque" and is equal to the nominal door torque minus a frictional torque component. The doors selected for determination of the "door closing torque" shall be selected to ensure that all doors are tested at least once during two test intervals.
5. Calculation of the frictional torque of each door tested in accordance with 3 and 4, above. The calculated frictional torque shall be  $\leq 40$  inch-pounds.

4.6.5.3.2 Intermediate Deck Doors - Each ice condenser intermediate deck door shall be:

- a. Verified closed and that opening of each door is not impaired by ice, frost or debris by a visual inspection at least once per 7 days, and
- b. Demonstrated OPERABLE at least once per 18 months by visually verifying no structural deterioration, by verifying free movement of the vent assemblies, and by ascertaining free movement when lifted with the applicable force shown below:

<u>Door</u>	<u>Lifting Force</u>
1. Adjacent to Crane Wall	$\leq 37.4$ lbs.
2. Paired with Door Adjacent to Crane Wall	$\leq 33.8$ lbs.
3. Adjacent to Containment Wall	$\leq 31.8$ lbs.
4. Paired with Door Adjacent to Containment Wall	$\leq 31.0$ lbs.

CONTAINMENT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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- 4.6.5.3.3 Top Deck Doors - Each ice condenser top deck door shall be determined closed and OPERABLE at least once per 92 days by visually verifying:
- a. That the doors are in place, and
  - b. That no condensation, frost, or ice has formed on the doors or blankets which would restrict their lifting and opening if required.

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APPLICABILITY: MODES 1, 2, 3 and 4:

#### ACTION:-

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