UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

INDIANA & MICHIGAN ELECTRIC COMPANY
INDIANA & MICHIGAN POWER COMPANY

DOCKET NO. 50-315

DONALD C. COOK NUCLEAR PLANT UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 18
License No. DPR-58

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by Indiana & Michigan Electric Company and Indiana & Michigan Power Company (the licensees) dated July 20 and December 7, 1976 and February 4 and 9, 1977, supplemented by letters dated July 19, October 1, November 5, 17, 23 and 30, December 7, 9 and 13, 1976, and February 8 and 9, 1977, comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraphs 2.C(1), 2.C(2) and 2.D of Facility Operating License No. DPR-58 are hereby amended in their entirety to read as follows:

"2.C(1) Maximum Power Level

The licensees are authorized to operate the Donald C. Cook Nuclear Plant, Unit No. 1, at steady state reactor core power levels not to exceed 3250 megawatts (thermal).

2.C(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 18, are hereby incorporated in the license. The licensees shall operate the facility in accordance with the Technical Specifications.

2.D The licensees shall maintain in effect and fully implement all provisions of the NRC Staff-approved physical security plan, including amendments and changes made pursuant to the authority of 10 CFR 50.54(p). The approved security plan consists of proprietary documents, collectively titled, "Donald C. Cook Nuclear Plant Industrial Security Plan," as follows:

Original, submitted with letter dated August 15, 1972, with revisions dated September 21, 1972, January 22, 1973, November 27, 1973, May 24, 1974, November 13, 1974, November 14, 1975, April 5, 1976, October 4, 1976, and December 20, 1976."

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Karl R. Goller

Karl R. Goller, Assistant Director
for Operating Reactors
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: February 16, 1977

ATTACHMENT TO LICENSE AMENDMENT NO. 18

FACILITY OPERATING LICENSE NO. DPR-58

DOCKET NO. 50-315

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

Pages

3/4 1-1
3/4 2-1
3/4 2-2
3/4 2-3
3/4 2-4
3/4 2-5
3/4 2-15
3/4 2-16
3/4 2-17
3/4 2-18 (added)
3/4 2-19 (added)
3/4 3-29
3/4 5-4
3/4 5-5
3/4 6-2
3/4 6-22
3/4 6-26
3/4 6-27
3/4 6-30
3/4 6-31
3/4 7-33
B 3/4 1-1
B 3/4 2-1
B 3/4 2-2
B 3/4 2-5
B 3/4 2-6
6-11



Ltr dtd 2-16-77

## 3/4.1.1 BORATION CONTROL

### SHUTDOWN MARGIN - $T_{avg}$ > 200°F

### LIMITING CONDITION FOR OPERATION

3.1.1.1 The SHUTDOWN MARGIN shall be $\geq$ 1.75% Δk/k.

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

ACTION:

With the SHUTDOWN MARGIN < 1.75% Δk/k, immediately initiate and continue boration at $\geq$ 10 gpm of 20,000 ppm boric acid solution or equivalent until the required SHUTDOWN MARGIN is restored.

### SURVEILLANCE REQUIREMENTS

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be $\geq$ 1.75% Δk/k:

a. Within one hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be increased by an amount at least equal to the withdrawn worth of the immovable or untrippable control rod(s).

b. When in MODES 1 or 2#, at least once per 12 hours by verifying that control bank withdrawal is within the limits of Specification 3.1.3.5.

c. When in MODE 2##, at least once during control rod withdrawal and at least once per hour thereafter until the reactor is critical.

d. Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading, by consideration of the factors of e below, with the control banks at the maximum insertion limit of Specification 3.1.3.5.

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*See Special Test Exception 3.10.1

#With $K_{eff} \geq 1.0$

##With $K_{eff} < 1.0$

SURVEILLANCE REQUIREMENTS (Continued)

e. When in MODES 3 or 4, at least once per 24 hours by consideration of the following factors:

1. Reactor coolant system boron concentration,
2. Control rod position,
3. Reactor coolant system average temperature,
4. Fuel burnup based on gross thermal energy generation,
5. Xenon concentration, and
6. Samarium concentration.

4.1.1.1.2 The overall core reactivity balance shall be compared to predicted values to demonstrate agreement within $\pm$ 1% $\Delta k/k$ at least once per 31 Effective Full Power Days (EFPD). This comparison shall consider at least those factors stated in Specification 4.1.1.1.1.e, above. The predicted reactivity values shall be adjusted (normalized) to correspond to the actual core conditions prior to exceeding a fuel burnup of 60 Effective Full Power Days after each fuel loading.

## 3/4.2 POWER DISTRIBUTION LIMITS

### AXIAL FLUX DIFFERENCE (AFD)

### LIMITING CONDITION FOR OPERATION

3.2.1 The indicated AXIAL FLUX DIFFERENCE (AFD) shall be maintained within a ±5% target band (flux difference units) about the target flux difference shown on Figure 3.2-4.

APPLICABILITY: MODE 1 above 50% RATED THERMAL POWER*

ACTION:

a. With the indicated AXIAL FLUX DIFFERENCE outside of the ±5% target band about the target flux difference and with THERMAL POWER:

1. Above 75% x E(t)# of RATED THERMAL POWER, within 15 minutes:

a) Either restore the indicated AFD to within the target band limits, or

b) Reduce THERMAL POWER to less than 75% x E(t) of RATED THERMAL POWER.

2. Between 50% and 75% x E(t) of RATED THERMAL POWER:

a) POWER OPERATION may continue provided:

1) The indicated AFD has not been outside of the ±5% target band for more than 1 hour penalty deviation cumulative during the previous 24 hours, and

2) The indicated AFD is within the limits shown on Figure 3.2-1. Otherwise, reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 30 minutes and reduce the Power Range Neutron Flux-High Trip Setpoints to ≤ 55% of RATED THERMAL POWER within the next 4 hours.

b) Surveillance testing of the Power Range Neutron Flux Channels may be performed pursuant to Specification 4.3.1.1.1 provided the indicated AFD is maintained within the limits of Figure 3.2-1. A total of 16 hours operation may be accumulated with the AFD outside of the target band during this testing without penalty deviation.

*See Special Test Exception 3.10.2
#E(t) is defined on Figure 3.2-3

POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION (Continued)

c) Surveillance testing of the APDMS may be performed pursuant to Specification 4.3.3.6.1 provided the indicated AFD is maintained with the limits of Figure 3.2-1. A total of 6 hours of operation may be accumulated with the AFD outside of the target band during this testing without penalty deviation.

b. THERMAL POWER shall not be increased above 75% x E(t) of RATED THERMAL POWER unless the indicated AFD is within the ± 5% target band and ACTION 2.a) 1), above has been satisfied.

c. THERMAL POWER shall not be increased above 50% of RATED THERMAL POWER unless the indicated AFD has not been outside of the ± 5% target band for more than 1 hour penalty deviation cumulative during the previous 24 hours.

SURVEILLANCE REQUIREMENTS

4.2.1.1 The indicated AXIAL FLUX DIFFERENCE shall be determined to be within its limits during POWER OPERATION above 15% of RATED THERMAL POWER by:

a. Monitoring the indicated AFD for each OPERABLE excore channel:

1. At least once per 7 days when the AFD Monitor Alarm is OPERABLE, and

2. At least once per hour for the first 24 hours after restoring the AFD Monitor Alarm to OPERABLE status.

b. Monitoring and logging the indicated AXIAL FLUX DIFFERENCE for each OPERABLE excore channel at least once per hour for the first 24 hours and at least once per 30 minutes thereafter, when the AXIAL FLUX DIFFERENCE Monitor Alarm is inoperable. The logged values of the indicated AXIAL FLUX DIFFERENCE shall be assumed to exist during the interval preceding each logging.

## POWER DISTRIBUTION LIMITS

### SURVEILLANCE REQUIREMENTS (Continued)

4.2.1.2 The indicated AFD shall be considered outside of its ± 5% target band when at least 2 of 4 or 2 of 3 OPERABLE excore channels are indicating the AFD to be outside the target band. POWER OPERATION outside of the ± 5% target band shall be accumulated on a time basis of:

a. One minute penalty deviation for each one minute of POWER OPERATION outside of the target band at THERMAL POWER levels equal to or above 50% of RATED THERMAL POWER, and

b. One-half minute penalty deviation for each one minute of POWER OPERATION outside of the target band at THERMAL POWER levels below 50% of RATED THERMAL POWER.

4.2.1.3 The target flux difference of each OPERABLE excore channel shall be determined by measurement at least once per 92 Effective Full Power Days with all part length control rods fully withdrawn. The provisions of Specification 4.0.4 are not applicable.

4.2.1.4 The target flux difference shall be updated at least once per 31 Effective Full Power Days by either determining the target flux difference pursuant to 4.2.1.3 above or by linear interpolation between the most recently measured value and 0 percent at the end of the cycle life. The provisions of Specification 4.0.4 are not applicable.

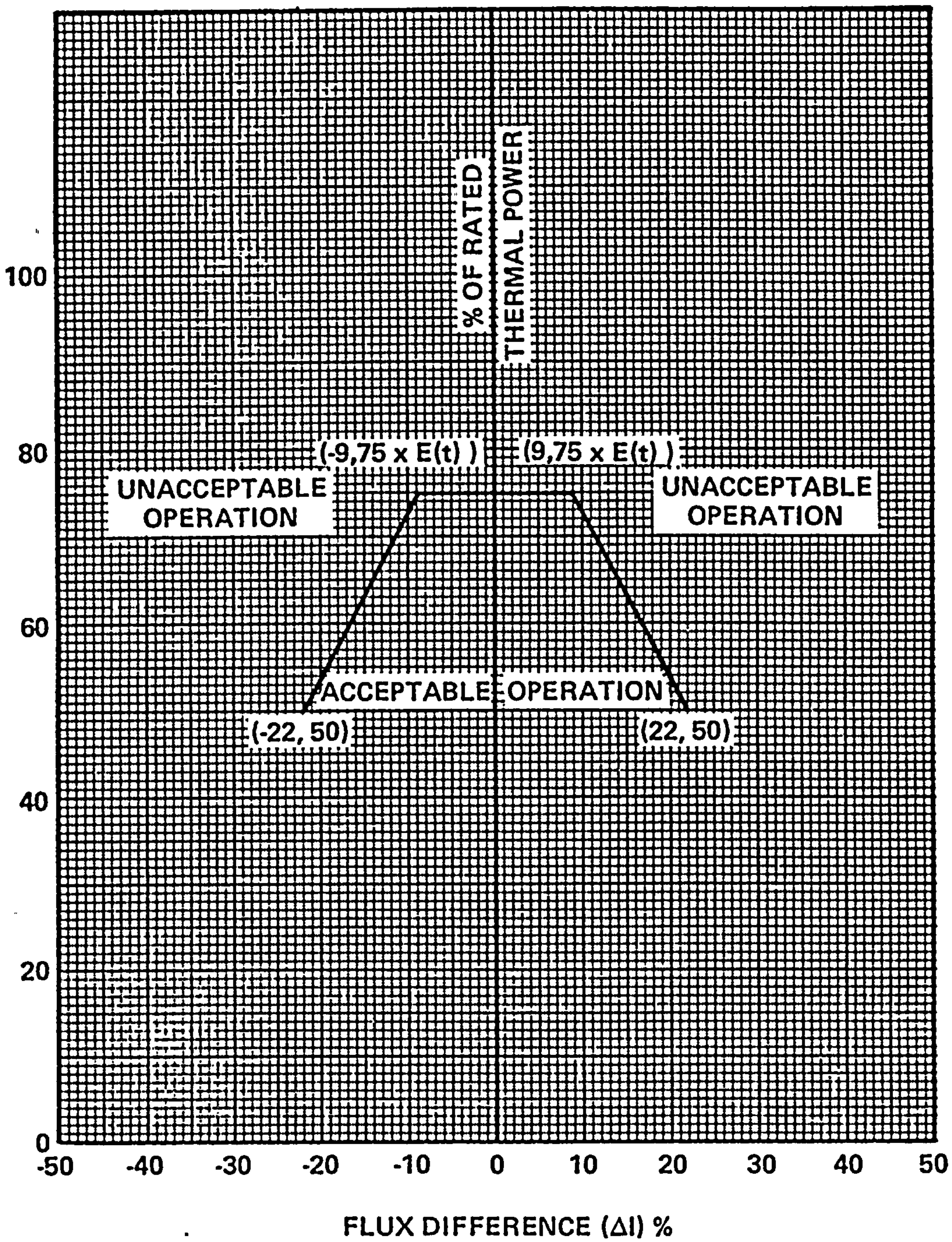


FIGURE 3.2-1 AXIAL FLUX DIFFERENCE LIMITS AS A FUNCTION OF RATED THERMAL POWER

## HEAT FLUX HOT CHANNEL FACTOR-$F_Q(Z)$

### LIMITING CONDITION FOR OPERATION

3.2.2 $F_Q(Z)$ shall be limited by the following relationships:

$$F_Q(Z) \leq \left[\frac{1.95}{P}\right] [E(t)] [K(Z)] \text{ for } P > 0.5$$

$$F_Q(Z) \leq [(3.90)] [E(t)] [(K(Z)] \text{ for } P \leq 0.5$$

where $P = \dfrac{\text{THERMAL POWER}}{\text{RATED THERMAL POWER}}$

E(t) is defined on Figure 3.2-3,

and K(Z) is the function obtained from Figure 3.2-2 for a given core height location.

APPLICABILITY: MODE 1

ACTION:

With $F_Q(Z)$ exceeding its limit:

a. Comply with either of the following ACTIONS:

1. Reduce THERMAL POWER at least 1% for each 1% $F_Q(Z)$ exceeds the limit within 15 minutes and similarly reduce the Power Range Neutron Flux-High Trip Setpoints within the next 4 hours; POWER OPERATION may proceed for up to a total of 72 hours; subsequent POWER OPERATION may proceed provided the Overpower ΔT Trip Setpoints have been reduced at least 1% for each 1% $F_Q(Z)$ exceeds the limit. The Overpower ΔT Trip Setpoint reduction shall be performed with the reactor subcritical.

2. Reduce THERMAL POWER as necessary to meet the limits of Specification 3.2.6 using the APDMS with the latest incore map and updated $\overline{R}$.

b. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER; THERMAL POWER may then be increased provided $F_Q(Z)$ is demonstrated through incore mapping to be within its limit.

## SURVEILLANCE REQUIREMENTS

4.2.2.1 The provisions of Specification 4.0.4 are not applicable.

4.2.2.2 $F_{xy}$ shall be evaluated to determine if $F_Q(Z)$ is within its limit by:

a. Using the movable incore detectors to obtain a power distribution map at any THERMAL POWER greater than 5% of RATED THERMAL POWER.

b. Increasing the measured $F_{xy}$ component of the power distribution map by 3% to account for manufacturing tolerances and further increasing the value by 5% to account for measurement uncertainties.

c. Comparing the $F_{xy}$ computed ($F_{xy}^C$) obtained in b, above to:

1. The $F_{xy}$ limits for RATED THERMAL POWER ($F_{xy}^{RTP}$) for the appropriate measured core planes given in e and f below, and

2. The relationship:

$$F_{xy}^L = F_{xy}^{RTP} \ [1+0.2(1-P)]$$

where $F_{xy}^L$ is the limit for fractional THERMAL POWER operation expressed as a function of $F_{xy}^{RTP}$ and P is the fraction of RATED THERMAL POWER at which $F_{xy}$ was measured.

d. Remeasuring $F_{xy}$ according to the following schedule:

1. When $F_{xy}^C$ is greater than the $F_{xy}^{RTP}$ limit for the appropriate measured core plane but less than the $F_{xy}^L$ relationship, additional power distribution maps shall be taken and $F_{xy}^C$ compared to $F_{xy}^{RTP}$ and $F_{xy}^L$ :

a) Either within 24 hours after exceeding by 20% of RATED THERMAL POWER or greater, the THERMAL POWER at which $F_{xy}^C$ was last determined, or

## AXIAL POWER DISTRIBUTION

### LIMITING CONDITION FOR OPERATION

3.2.6 The axial power distribution shall be limited by the following relationship:

$$[F_j(Z)]_S = \frac{[1.95]\,[K(Z)]\,[E(t)]}{(\overline{R}_j)(P_L)(1.03)(1 + \sigma_j)(1.07)}$$

Where:

a. $F_j(Z)$ is the normalized axial power distribution from thimble j at core elevation Z.

b. $P_L$ is the fraction of RATED THERMAL POWER.

c. K(Z) is the function obtained from Figure 3.2-2 for a given core height location.

d. $\overline{R}_j$, for thimble j, is determined from at least n=6 in-core flux maps covering the full configuration of permissible rod patterns above 84% x E(t) of RATED THERMAL POWER in accordance with:

$$\overline{R}_j = \frac{1}{n} \sum_{i=1}^{n} R_{ij}$$

Where:

$$R_{ij} = \frac{F_{Qi}^{Meas}}{[F_{ij}(Z)]_{Max}}$$

e. E(t) is defined on Figure 3.2-3.

LIMITING CONDITION FOR OPERATION (Continued)

and $[F_{ij}(Z)]_{Max}$ is the maximum value of the normalized axial distribution at elevation Z from thimble j in map i which had a measured peaking factor without uncertainties or densification allowance of $F_{Qi}^{Meas}$.

$\sigma_j$ is the standard deviation associated with thimble j, expressed as a fraction or percentage of $\overline{R}_j$, and is derived from n flux maps from the relationship below, or 0.02, (2%) whichever is greater.

$$\sigma_j = \frac{\left[\frac{1}{n-1}\sum_{i=1}^{n}(\overline{R}_j - R_{ij})^2\right]^{1/2}}{\overline{R}_j}$$

The factor 1.07 is comprised of 1.02 and 1.05 to account for the axial power distribution instrumentation accuracy and the measurement uncertainty associated with $F_Q$ using the movable detector system respectively.

The factor 1.03 is the engineering uncertainty factor.

APPLICABILITY: MODE 1 above 84% x E(t) OF RATED THERMAL POWER#.

ACTION:

a. With a $F_j(Z)$ factor exceeding $[F_j(Z)]_S$ by $\leq$ 4 percent, reduce THERMAL POWER one percent for every percent by which the $F_j(Z)$ factor exceeds its limit within 15 minutes and within the next two hours either reduce the $F_j(Z)$ factor to within its limit or reduce THERMAL POWER to 84% x E(t) or less of RATED THERMAL POWER.

b. With a $F_j(Z)$ factor exceeding $[F_j(Z)]_S$ by > 4 percent, reduce THERMAL POWER to 84% x E(t) or less of RATED THERMAL POWER within 15 minutes.

# The APDMS may be out of service: 1) when incore maps are being taken as part of the Augmented Startup Test Program or 2) when surveillance for determining power distribution maps is being performed.

## SURVEILLANCE REQUIREMENTS

4.2.6.1 $F_j(Z)$ shall be determined to be within its limit by:

a. Either using the APDMS to monitor the thimbles required per Specification 3.3.3.6 at the following frequencies.

1. At least once per 8 hours, and

2. Immediately and at intervals of 10, 30, 60, 90, 120, 240 and 480 minutes following:

a) Increasing the THERMAL POWER above 84% x E(t) of RATED THERMAL POWER, or

b) Movement of control bank "D" more than an accumulated total of 5 steps in any one direction.

b. Or using the movable incore detectors at the following frequencies when the APDMS is inoperable:

1. At least once per 8 hours, and

2. At intervals of 30, 60, 90, 120, 240 and 480 minutes following:

a) Increasing the THERMAL POWER above 84% x E(t) of RATED THERMAL POWER, or

b) Movement of control bank "D" more than an accumulated total of 5 steps in any one direction.

4.2.6.2 When the movable incore detectors are used to monitor $F_j(Z)$, at least 2 thimbles shall be monitored and an $F_j(Z)$ accuracy equivalent to that obtained from the APDMS shall be maintained.

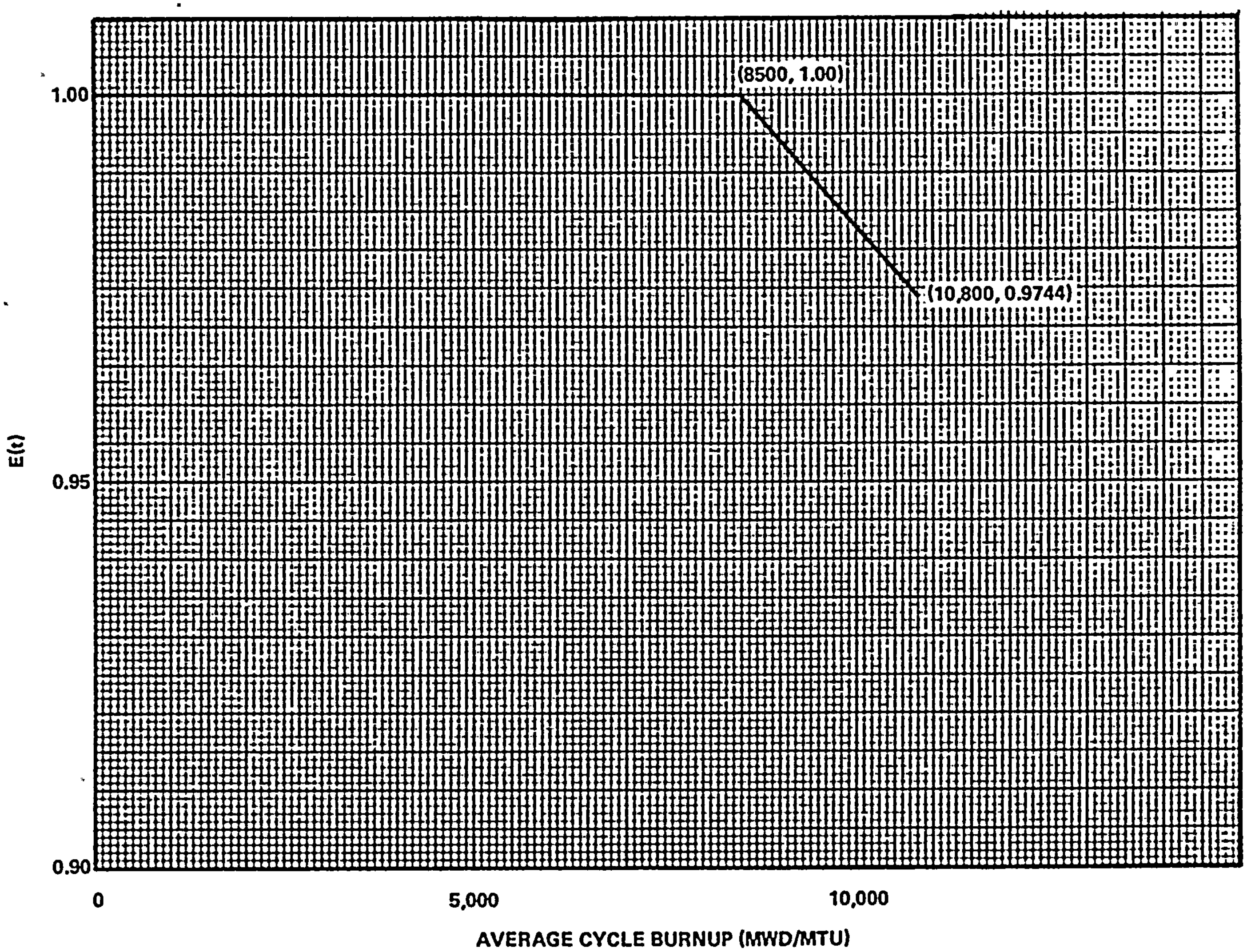


Figure 3.2-3 E(t) Normalized Core Power as a Function of Cycle Burnup

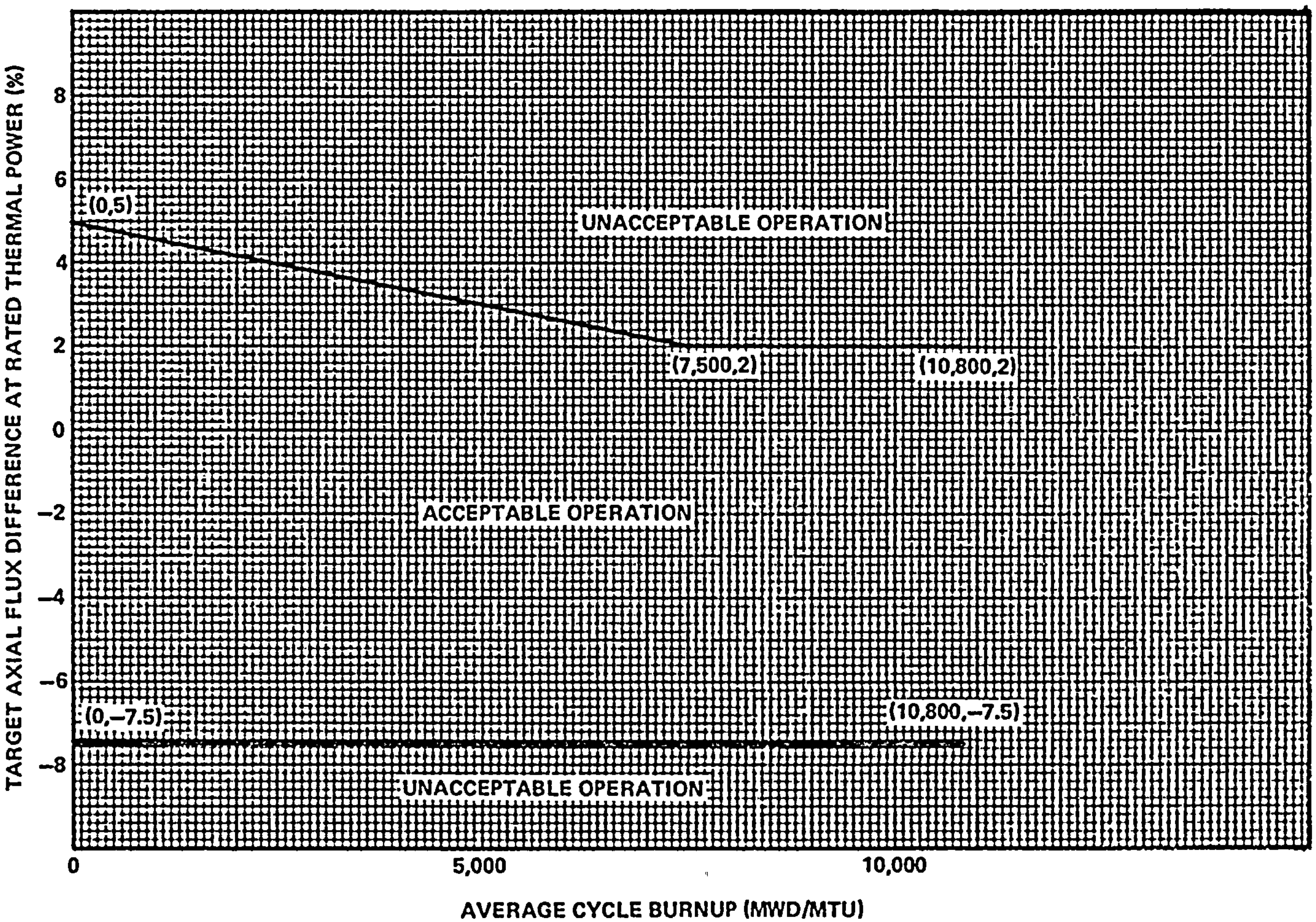


Figure 3.2-4 Target Axial Flux Difference at RATED THERMAL POWER as a Function of Cycle Burnup

## TABLE 3.3-5 (Continued)

## ENGINEERED SAFETY FEATURES RESPONSE TIMES

| INITIATING SIGNAL AND FUNCTION | RESPONSE TIME IN SECONDS |
|---|---|
| 6. Steam Flow in Two Steam Lines-High Coincident with Steam Line Pressure-Low | |
| a. Safety Injection (ECCS) | $\leq$ 13.0#/23.0## |
| b. Reactor Trip (from SI) | $\leq$ 3.0 |
| c. Feedwater Isolation | $\leq$ 8.0 |
| d. Containment Isolation-Phase "A" | $\leq$ 18.0#/28.0## |
| e. Containment Purge and Exhaust Isolation | Not Applicable |
| f. Auxiliary Feedwater Pumps | Not Applicable |
| g. Essential Service Water System | $\leq$ 14.0#/48.0## |
| h. Steam Line Isolation | $\leq$ 8.0 |
| 7. Containment Pressure--High-High | |
| a. Containment Spray | $\leq$ 45.0 |
| b. Containment Isolation-Phase "B" | Not Applicable |
| c. Steam Line Isolation | $\leq$ 7.0 |
| d. Containment Air Recirculation Fan | $\leq$ 660.0 |
| 8. Steam Generator Water Level--High-High | |
| a. Turbine Trip-Reactor Trip | $\leq$ 2.5 |
| b. Feedwater Isolation | $\leq$ 11.0 |

## TABLE 3.3-5 (Continued)

### TABLE NOTATION

* Diesel generator starting and sequence loading delays included. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps, SI and RHR pumps.

# Diesel generator starting and sequence loading delays not included. Offsite power available. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps.

## Diesel generator starting and sequence loading delays included. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps.

EMERGENCY CORE COOLING SYSTEMS

ECCS SUBSYSTEMS - $T_{avg} \geq 350°F$

LIMITING CONDITION FOR OPERATION

3.5.2 Two independent ECCS subsystems shall be OPERABLE with each subsystem comprised of:

a. One OPERABLE centrifugal charging pump,

b. One OPERABLE safety injection pump,

c. One OPERABLE residual heat removal heat exchanger,

d. One OPERABLE residual heat removal pump, and

e. An OPERABLE flow path capable of taking suction from the refueling water storage tank on a safety injection signal and transferring suction to the containment sump during the recirculation phase of operation.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

a. With one ECCS subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or be in HOT SHUTDOWN within the next 12 hours.

b. In the event the ECCS is actuated and injects water into the Reactor Coolant System, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date.

## SURVEILLANCE REQUIREMENTS

4.5.2 Each ECCS subsystem shall be demonstrated OPERABLE:

a. At least once per 31 days on a STAGGERED TEST BASIS by:

1. Verifying that each centrifugal charging pump:

   a) Starts (unless already operating) from the control room.

   b) Develops a discharge pressure of $\geq$ 2405 psig on recirculation flow.

   c) Operates for at least 15 minutes.

2. Verifying that each safety injection pump:

   a) Starts (unless already operating) from the control room.

   b) Develops a discharge pressure of $\geq$ 1445 psig on recirculation flow.

   c) Operates for at least 15 minutes.

3. Verifying that each residual heat removal pump:

   a) Starts (unless already operating) from the control room.

   b) Develops a discharge pressure $\geq$ 195 psig on recirculation flow.

   c) Operates for at least 15 minutes.

4. Verifying that the following valves are in the specified positions with control power locked-out:

| Valve Number | Valve Function | Valve Position |
|---|---|---|
| a. IMO-390 | a. RWST to RHR | a. Open |
| b. IMO-315 | b. Low head SI to Hot Leg | b. Closed |
| c. IMO-325 | c. Low head SI to Hot Leg | c. Closed |

EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

| Valve Number | Valve Function | Valve Position |
|---|---|---|
| d. IMO 262* | d. Mini flow line | d. Open |
| e. IMO 263* | e. Mini flow line | e. Open |
| f. IMO 261* | f. SI Suction | f. Open |
| g. ICM 305* | g. Sump line | g. Closed |
| h. ICM 306* | h. Sump line | h. Closed |

5. Cycling each testable power operated or automatic valve in the flow path through at least one complete cycle of full travel.

6. Verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. By a visual inspection which verifies that no loose debris (rags, trash, clothing, etc.) is present in the containment which could be transported to the containment sump and cause restriction of the pump suctions during LOCA conditions. This visual inspection shall be performed:

1. For all accessible areas of the containment prior to establishing containment integrity, and

2. Of the areas affected within containment at the completion of each containment entry when containment integrity is established.

c. At least once per 18 months by:

1. Verifying automatic isolation and interlock action of the RHR system from the Reactor Coolant System when the Reactor Coolant System pressure is above 600 psig.

2. A visual inspection of the containment sump and verifying that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or corrosion.

*These valves must change position during the switchover from injection to recirculation flow following LOCA.

SURVEILLANCE REQUIREMENTS (Continued)

d. At least once per 18 months, during shutdown, by:

1. Cycling each power operated (excluding automatic) valve in the flow path that is not testable during plant operation, through at least one complete cycle of full travel.

2. Verifying that each automatic valve in the flow path actuates to its correct position on a Safety Injection signal.

3. Verifying that each of the following pumps start automatically upon receipt of a safety injection signal:

   a) Centrifugal charging pump

   b) Safety injection pump

   c) Residual heat removal pump

## 3/4.6 CONTAINMENT SYSTEMS

### 3/4.6.1 PRIMARY CONTAINMENT

### CONTAINMENT INTEGRITY

### LIMITING CONDITION FOR OPERATION

3.6.1.1 Primary CONTAINMENT INTEGRITY shall be maintained.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Without primary CONTAINMENT INTEGRITY, restore CONTAINMENT INTEGRITY within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

### SURVEILLANCE REQUIREMENTS

4.6.1.1 Primary CONTAINMENT INTEGRITY shall be demonstrated:

a. At least once per 31 days by verifying that:

   1. All penetrations not capable of being closed by OPERABLE containment automatic isolation valves and required to be closed during accident conditions are closed by valves, blind flanges, or deactivated automatic valves secured in their positions, except as provided in Table 3.6-1 of Specification 3.6.3.1, and

   2. All equipment hatches are closed and sealed,

b. By verifying that each containment air lock is OPERABLE per Specification 3.6.1.3.

## CONTAINMENT LEAKAGE

### LIMITING CONDITION FOR OPERATION

3.6.1.2 Containment leakage rates shall be limited to:

a. An overall integrated leakage rate of $\leq L_a$, 0.25 percent by weight of the containment air per 24 hours at $P_a$, 12.0 psig, and

b. A combined leakage rate of $\leq 0.60\ L_a$ for all penetrations and valves subject to Type B and C tests when pressurized to $P_a$.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With either (a) the measured overall integrated containment leakage rate exceeding 0.75 $L_a$ or (b) with the measured combined leakage rate for all penetrations and valves subject to Types B and C tests exceeding 0.60 $L_a$, restore the leakage rate(s) to within the limit(s) prior to increasing the Reactor Coolant System temperature above 200°F.

### SURVEILLANCE REQUIREMENTS

4.6.1.2 The containment leakage rates shall be demonstrated at the following test schedule and shall be determined in conformance with the criteria specified in Appendix J of 10 CFR 50 using the methods and provisions of ANSI N45.4-1972:

a. Three Type A tests (Overall Integrated Containment Leakage Rate) shall be conducted at 40 ± 10 month intervals during shutdown at $P_a$, 12.0 psig, during each 10-year service period. The third test of each set shall be conducted during the shutdown for the 10-year plant inservice inspection.

TABLE 3.6-1 (Continued)

| VALVE NUMBER | | FUNCTION | TESTABLE DURING PLANT OPERATION | ISOLATION TIME IN SECONDS |
|---|---|---|---|---|
| C. | CONTAINMENT PURGE AND EXHAUST (Continued) | | | |
| 12. | VCR-205 | Upper Comp. Purge Air Inlet | Yes | 10 |
| 13. | VCR-206 | Upper Comp. Purge Air Outlet | Yes | 10 |
| 14. | VCR-207* | Cont. Press Relief Fan Isolation | Yes | 10 |
| D. | MANUAL ISOLATION VALVES(1) | | | |
| 1. | ICM-111 | RHR to RC Cold Legs | Yes | NA |
| 2. | ICM-129 | RHR Inlet to Pumps | No | NA |
| 3. | ICM-250 | Boron Injection Inlet | Yes | NA |
| 4. | ICM-251 | Boron Injection Inlet | Yes | NA |
| 5. | ICM-260 | Safety Injection Inlet | Yes | NA |
| 6. | ICM-265 | Safety Injection Inlet | Yes | NA |
| 7. | ICM-305 | RHR Suction from Sump | Yes | NA |
| 8. | ICM-306 | RHR Suction from Sump | Yes | NA |
| 9. | ICM-311 | RHR to RC Hot Legs | Yes | NA |
| 10. | ICM-321 | RHR to RC Hot Legs | Yes | NA |
| 11. | DW-209 | Demineralized Water Supply for Refueling Cavity | Yes | NA |
| 12. | DW-210 | Demineralized Water Supply for Refueling Cavity | Yes | NA |
| 13. | NPX 151 VI | Dead Weight Tester | Yes | NA |
| 14. | PA 145* | Containment Service Air | No | NA |
| 15. | SF-151* | Refueling Water Supply | Yes | NA |
| 16. | SF-153* | Refueling Water Supply | Yes | NA |
| 17. | SF-159 | Refueling Cavity Drain to Purification System | Yes | NA |
| 18. | SF-160 | Refueling Cavity Drain to Purification System | Yes | NA |
| 19. | SI-171 | Safety Injection Test Line | Yes | NA |
| 20. | SI-172 | Accumulator Test Line | Yes | NA |

## TABLE 3.6-1 (Continued)

| VALVE NUMBER | FUNCTION | TESTABLE DURING PLANT OPERATION | ISOLATION TIME IN SECONDS |
|---|---|---|---|
| D. MANUAL ISOLATION VALVES(1) (Continued) | | | |
| 21. CCR-440 | CCW from Main Steam Penetration | Yes | NA |
| 22. CCR-441 | CCW from Main Steam Penetration | Yes | NA |
| 23. MCM-221 | Main Steam to Auxiliary Feed Pump | No | NA |
| 24. MCM-231 | Main Steam to Auxiliary Feed Pump | No | NA |
| 25. CCM-430 | CCW to East Pressure Equalization Fan | Yes | NA |
| 26. CCM-431 | CCW from East Pressure Equalization Fan | Yes | NA |
| 27. CCM-432 | CCW to West Pressure Equalization Fan | Yes | NA |
| 28. CCM-433 | CCW from West Pressure Equalization Fan | Yes | NA |
| 29. SM-8* | Upper Containment Sample | Yes | NA |
| 30. SM-10* | Upper Containment Sample | Yes | NA |
| 31. SM-4* | Instrument Room Sample | Yes | NA |
| 32. SM-6* | Instrument Room Sample | Yes | NA |

NA - Manual Valve-Isolation time not applicable.
(1) - Includes motor operated valves which do not isolate automatically.
* - May be opened on an intermittent basis under administrative control.

SURVEILLANCE REQUIREMENTS (Continued)

3. Verifying during a recombiner system functional test that the heater sheath temperature increases to ≥ 1200°F within 5 hours and is maintained for at least 4 hours.

4. Verifying the integrity of all heater electrical circuits by performing a continuity and resistance to ground test immediately following the above required functional test. The resistance to ground for any heater phase shall be ≥ 10,000 ohms.

CONTAINMENT SYSTEMS

3/4.6.5 ICE CONDENSER

ICE BED

LIMITING CONDITION FOR OPERATION

3.6.5.1 The ice bed shall be OPERABLE with:

a. The stored ice having a sodium tetraborate concentration of at least 1800 ppm boron and a pH of 9.0 to 9.5,

b. Flow channels through the ice condenser,

c. A maximum ice bed temperature of $\leq$ 27°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

4.6.5.1 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°F.

b. At least once per 12 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 as sodium tetraborate and a pH of 9.0 to 9.5.

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

SURVEILLANCE REQUIREMENTS (Continued)

shall be 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 7, Group 2 - bays 8 through 14, and Group 3 - bays 15 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 thickness of $\leq$ 0.38 inches. If one flow passage per bay is found to have an accumulation of frost or ice with a thickness of $>$ 0.38 inches, 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

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 ≤ 20°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 25 ton refrigeration chillers;

   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 ≤ 15°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

### SURVEILLANCE REQUIREMENTS

4.6.5.2 The ice bed temperature monitoring system shall be determined OPERABLE by performance of a CHANNEL CHECK at least once per 12 hours.

## CONTAINMENT SYSTEMS

## ICE CONDENSER DOORS

### LIMITING CONDITION FOR OPERATION

3.6.5.3 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°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

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 at least once per 3 months during the first year after the ice bed is fully loaded and at least once per 6 months thereafter 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 25% 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

SURVEILLANCE REQUIREMENTS (Continued)

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

4. Testing a sample of at least 25% 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 four 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 free of frost accumulation by a visual inspection at least once per 7 days, and

b. Demonstrated OPERABLE at least once per 3 months during the first year after the ice bed is fully loaded and at least once per 18 months thereafter 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:

| Door | Lifting Force |
|---|---|
| 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. |

## SURVEILLANCE REQUIREMENTS (Continued)

4.6.5.3.3 Top Deck Doors - Each ice condenser top deck door shall be determined closed and OPERABLE at least once per 3 months 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.

TABLE 3.7-4

SAFETY RELATED HYDRAULIC SNUBBERS*

| SNUBBER NO. | SYSTEM SNUBBER INSTALLED ON, LOCATION AND ELEVATION | ACCESSIBLE OR INACCESSIBLE | HIGH RADIATION ZONE | ESPECIALLY DIFFICULT TO REMOVE |
|---|---|---|---|---|
| (Ser. No. 11928) | RC Pump Seal Water Supply. Az 130°, Elev. 610'. Between RC Pump No. 2 and Crane Wall, immediately under grating | I | Yes | No |
| 1-FWS-4 | Feedwater. Az 160°, Elev. 648' Behind Stm. Gen. No. 2 | I | Yes | No |
| 1-FWS-4 | Feedwater. Az 160°, Elev. 646' Behind Stm. Gen. No. 2 | I | Yes | No |
| 1-FWS-5 | Feedwater. Az 163°, Elev. 647' Behind Stm. Gen. No. 2 | I | Yes | No |
| 1-FWS-6 | Feedwater. Az 157°, Elev. 630' Behind Stm. Gen. No. 2 | I | Yes | No |
| 1-MSS-3 | Main Steam. Az 175°, Elev. 648' Between Stm. Gen. No. 2 & No. 3 | I | Yes | Yes |
| 1-MSS-4 | Main Steam. Az 170°, Elev. 648' Between Stm. Gen. No. 2 & No. 3 | I | Yes | Yes |
| 1-MSS-5 | Main Steam. Az 185°, Elev. 648' Between Stm. Gen. No. 2 & No. 3 | I | Yes | Yes |
| 1-MSS-6 | Main Steam. Az 185°, Elev. 648' Between Stm. Gen. No. 2 & No. 3 | I | Yes | Yes |
| 1-FWS-9 | Feedwater, Az 194°, Elev. 634' Behind Stm. Gen. No. 3 | I | Yes | No |

TABLE 3.7-4

SAFETY RELATED HYDRAULIC SNUBBERS*

| SNUBBER NO. | SYSTEM SNUBBER INSTALLED ON, LOCATION AND ELEVATION | ACCESSIBLE OR INACCESSIBLE | HIGH RADIATION ZONE | ESPECIALLY DIFFICULT TO REMOVE |
|---|---|---|---|---|
| 1-GRC-S-582 | Reactor Coolant. Az 195°, Elev. 619'. Near Reactor Cavity Wall, across from Stm. Gen. No. 3 | I | Yes | No |
| 1-FWS-8 | Feedwater. Az 200°, Elev. 648' Behind Stm. Gen. No. 3 | I | Yes | No |
| 1-FWS-8 | Feedwater. Az 200°, Elev. 646' Behind Stm. Gen. No. 3 | I | Yes | No |
| 1-FWS-7 | Feedwater. Az 195°, Elev. 647' Behind Stm. Gen. No. 3 | I | Yes | No |
| Ser. No 25.12620.007-1 | Steam Generator No. 1, Elev. 665' | I | Yes | Yes |
| Ser. No. 25.12620.007-5 | Steam Generator No. 1, Elev. 665' | I | Yes | Yes |
| Ser. No. 25.12620.007-7 | Steam Generator No. 1. Elev. 665' | I | Yes | Yes |
| Ser. No. 25.12620.007-14 | Steam Generator No. 1, Elev. 665' | I | Yes | Yes |
| Ser. No. 25.12620.007-3 | Steam Generator No. 2, Elev. 665' | I | Yes | Yes |
| Ser. No. 25.12620.007-6 | Steam Generator No. 2, Elev. 665' | I | Yes | Yes |
| Ser No. 25.1[illegible]0.007-9 | Steam Generator No. 2, Elev. 665' | I | Yes | Yes |

## 3/4.1 REACTIVITY CONTROL SYSTEMS

## BASES

### 3/4.1.1 BORATION CONTROL

### 3/4.1.1.1 and 3/4.1.1.2 SHUTDOWN MARGIN

A sufficient SHUTDOWN MARGIN ensures that 1) the reactor can be made subcritical from all operating conditions, 2) the reactivity transients associated with postulated accident conditions are controllable within acceptable limits, and 3) the reactor will be maintained sufficiently subcritical to preclude inadvertent criticality in the shutdown condition.

SHUTDOWN MARGIN requirements vary throughout core life as a function of fuel depletion, RCS boron concentration, and RCS $T_{avg}$. The most restrictive condition occurs at EOL, with $T_{avg}$ at no load operating temperature, and is associated with a postulated steam line break accident and resulting uncontrolled RCS cooldown. In the analysis of this accident, a minimum SHUTDOWN MARGIN of 1.75%$\Delta k/k$ is initially required to control the reactivity transient. Accordingly, the SHUTDOWN MARGIN requirement is based upon this limiting condition and is consistent with FSAR accident analysis assumptions. With $T_{avg}$ <350°F, the reactivity transients resulting from a postulated steam line break cooldown are minimal and a 1% $\Delta k/k$ shutdown margin provides adequate protection.

### 3/4.1.1.3 BORON DILUTION

A minimum flow rate of at least 3000 GPM provides adequate mixing, prevents stratification and ensures that reactivity changes will be gradual during boron concentration reductions in the Reactor Coolant System. A flow rate of at least 3000 GPM will circulate an equivalent Reactor Coolant System volume of 12,612 $\pm$ 100 cubic feet in approximately 30 minutes. The reactivity change rate associated with boron reductions will therefore be within the capability for operator recognition and control.

### 3/4.1.1.4 MODERATOR TEMPERATURE COEFFICIENT (MTC)

The limitations on MTC are provided to ensure that the assumptions used in the accident and transient analyses remain valid through each fuel cycle. The surveillance requirement for measurement of the MTC at the beginning, and near the end of each fuel cycle is adequate to confirm the MTC value since this coefficient changes slowly due

## 3/4.1.1.4 MODERATOR TEMPERATURE COEFFICIENT (MTC) (Continued)

principally to the reduction in RCS boron concentration associated with fuel burnup. The confirmation that the measured and appropriately compensated MTC value is within the allowable tolerance of the predicted value provides additional assurances that the coefficient will be maintained within its limits during intervals between measurement.

## 3/4.1.1.5 MINIMUM TEMPERATURE FOR CRITICALITY

This specification ensures that the reactor will not be made critical with the Reactor Coolant System average temperature less than 541°F. This limitation is required to ensure 1) the moderator temperature coefficient is within its analyzed temperature range, 2) the protective instrumentation is within its normal operating range, and 3) $T_{avg}$ is above the P-12 interlock setpoint.

## 3/4.1.2 BORATION SYSTEMS

The boron injection system ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include 1) borated water sources, 2) charging pumps, 3) separate flow paths, 4) boric acid transfer pumps, 5) associated heat tracing systems, and 6) an emergency power supply from OPERABLE diesel generators.

With the RCS average temperature above 200°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

The boration capability of either system is sufficient to provide a SHUTDOWN MARGIN from all operating conditions of 1.0% $\Delta k/k$ after xenon decay and cooldown to 200°F. The maximum boration capability requirement occurs at EOL from full power equilibrium xenon conditions and requires 5106 gallons of 20,100 ppm borated water from the boric acid storage tanks or 52,622 gallons of 1950 ppm borated water from the refueling water storage tank.

## 3/4.2 POWER DISTRIBUTION LIMITS

### BASES

The specifications of this section provide assurance of fuel integrity during Condition I (Normal Operation) and II (Incidents of Moderate Frequency) events by: (a) maintaining the minimum DNBR in the core $\geq$ 1.30 during normal operation and in short term transients, and (b) limiting the fission gas release, fuel pellet temperature and cladding mechanical properties to within assumed design criteria. In addition, limiting the peak linear power density during Condition I events provides assurance that the initial conditions assumed for the LOCA analyses are meet and the ECCS acceptance criteria limit of 2200°F is not exceeded.

The definitions of hot channel factors as used in these specifications are as follows:

$F_Q(Z)$ Heat Flux Hot Channel Factor, is defined as the maximum local heat flux on the surface of a fuel rod at core elevation Z divided by the average fuel rod heat flux, allowing for manufacturing tolerances on fuel pellets and rods.

$F^N_{\Delta H}$ Nuclear Enthalpy Rise Hot Channel Factor, is defined as the ratio of the integral of linear power along the rod with the highest integrated power to the average rod power.

### 3/4.2.1 AXIAL FLUX DIFFERENCE (AFD)

Target flux difference is determined at equilibrium xenon conditions with the part length control rods withdrawn from the core. The full length rods may be positioned within the core in accordance with their respective insertion limits and should be inserted near their normal position for steady state operation at high power levels. The value of the target flux difference obtained under these conditions divided by the fraction of RATED THERMAL POWER is the target flux difference at RATED THERMAL POWER for the associated core burnup conditions. Target flux differences for other THERMAL POWER levels are obtained by multiplying the RATED THERMAL POWER value by the appropriate fractional THERMAL POWER level. The periodic updating of the target flux difference value is necessary to reflect core burnup considerations.

## BASES

Although it is intended that the plant will be operated with the AXIAL FLUX DIFFERENCE within the ± 5% target band about the target flux difference, during rapid plant THERMAL POWER reductions, control rod motion will cause the AFD to deviate outside of the target band at reduced THERMAL POWER levels. This deviation will not affect the xenon redistribution sufficiently to change the envelope of peaking factors which may be reached on a subsequent return to RATED THERMAL POWER (with the AFD within the target band) provided the time duration of the deviation is limited. Accordingly, a 1 hour penalty deviation limit cumulative during the previous 24 hours is provided for operation outside of the target band but within the limits of Figure 3.2-1 while at THERMAL POWER levels between 50% and 75% x E(t) of RATED THERMAL POWER. For THERMAL POWER levels between 15% and 50% of RATED THERMAL POWER, deviations the AFD outside of the target band are less significant. The penalty of 2 hours actual time reflects this reduced significance.

Provisions for monitoring the AFD on an automatic basis are derived from the plant process computer through the AFD Monitor Alarm. The computer determines the one minute average of each of the OPERABLE excore detector outputs and provides an alarm message immediately if the AFD for at least 2 of 4 or 2 of 3 OPERABLE excore channels are outside the target band and the THERMAL POWER is greater than 75% x E(t) of RATED THERMAL POWER. During operation at THERMAL POWER levels between 50% and 75% x E(t) and between 15% and 50% RATED THERMAL POWER, the computer outputs an alarm message when the penalty deviation accumulates beyond the limits of 1 hour and 2 hours, respectively.

The upper bound limit (84% x E(t) of RATED THERMAL POWER) on AXIAL FLUX DIFFERENCE assures that the $F_Q(Z)$ envelope of 2.32 times the normalized peaking factor is not exceeded during either normal operation or in the event of xenon redistribution following power changes. The lower bound limit (50% of RATED THERMAL POWER) is based on the fact that at THERMAL POWER levels below 50% of RATED THERMAL POWER, the average linear heat generation rate is half of its nominal operating value and below that value, perturbations in localized flux distributions cannot affect the results of ECCS or ONBR analyses in a manner which would adversely affect the health and safety of the public.

Figure B 3/4 2-1 shows a typical monthly target band near the beginning of core life.

BASES

a. abnormal perturbations in the radial power shape, such as from rod misalignment, effect $F^N_{\Delta H}$ more directly than $F_Q$,

b. although rod movement has a direct influence upon limiting $F_Q$ to within its limit, such control is not readily available to limit $F^N_{\Delta H}$, and

c. errors in prediction for control power shape detected during startup physics tests can be compensated for in $F_Q$ by restricting axial flux distributions. This compensation for $F^N_{\Delta H}$ is less readily available.

A burnup dependent $F_Q$ is speficied for fuel Cycle 2 to account for the effects of uncertainties in the Exxon reload fuel internal pin pressure on flow blockage calculations for 10 CFR Part 50 Appendix K criteria. The internal fuel pin pressure uncertainty was calculated using the methods of "Revision 1 to the Staff Safety Evaluation Report on the Exxon Nuclear Company WREM-Based Generic PWR-ECCS Evaluation Model ENC-WREM-II," dated January 5, 1977.

3/4.2.4 QUADRANT POWER TILT RATIO

The quadrant power tilt ratio limit assures that the radial power distribution satisfies the design values used in the power capability analysis. Radial power distribution measurements are made during startup testing and periodically during power operation.

The limit of 1.02 at which corrective action is required provides DNB and linear heat generation rate protection with x-y plane power tilts. A limiting tilt of 1.025 can be tolerated before the margin for uncertainty in $F_Q$ is depleted. The limit of 1.02 was selected to provide an allowance for the uncertainty associated with the indicated power tilt.

The two hour time allowance for operation with a tilt condition greater than 1.02 but less than 1.09 is provided to allow identification and correction of a dropped or misaligned rod. In the event such action does not correct the tilt, the margin for uncertainty on $F_Q$ is reinstated by reducing the power by 3 percent for each percent of tilt in excess of 1.0.

## 3/4.2.5 DNB PARAMETERS

The limits on the DNB related parameters assure that each of the parameters are maintained within the normal steady state envelope of operation assumed in the transient and accident analyses. The limits are consistent with the initial FSAR assumptions and have been analytically demonstrated adequate to maintain a minimum DNBR of 1.30 throughout each analyzed transient.

The 12 hour periodic surveillance of these parameters thru instrument readout is sufficient to ensure that the parameters are restored within their limits following load changes and other expected transient operation. The 18 month periodic measurement of the RCS total flow rate is adequate to detect flow degradation and ensure correlation of the flow indication channels with measured flow such that the indicated percent flow will provide sufficient verification of flow rate on a 12 hour basis.

## 3/4.2.6 AXIAL POWER DISTRIBUTION

The limit on axial power distribution ensures that $F_Q$ will be controlled and monitored on a more exact basis through use of the APDMS when operating above 84% x E(t) of RATED THERMAL POWER. This additional limitation on $F_Q$ is necessary in order to provide assurance that peak clad temperatures will remain below the ECCS acceptance criteria limit of 2200°F in the event of a LOCA.

During Cycle 2 operation, the unit will have 65 fuel assemblies supplied by the Exxon Nuclear Company with the balance remaining from the original fuel supplied by Westinghouse Electric Corporation. The specified limit of $F_Q$ represents the Exxon fuel, the more restrictive of these two fuel types during initial Cycle 2 operation.

## AUDITS

6.5.2.8 Audits of facility activities shall be performed under the cognizance of the NSDRC. These audits shall encompass:

a. The conformance of facility operation to provisions contained within the Technical Specifications and applicable license conditions at least once per 12 months.

b. The performance, training and qualifications of the entire facility staff at least once per 12 months.

c. The results of actions taken to correct deficiencies occurring in facility equipment, structures, systems or method of operation that affect nuclear safety at least once per 6 months.

d. The performance of activities required by the Quality Assurance Program to meet the criteria of Appendix "B", 10 CFR 50, at least once per 24 months.

e. The Facility Emergency Plan and implementing procedures at least once per 24 months.

f. The Facility Security Plan and implementing procedures at least once per 24 months.

g. Any other area of facility operation considered appropriate by the NSDRC.

## AUTHORITY

6.5.2.9 The NSDRC shall report to and advise the Senior Executive Vice President, Engineering and Construction, AEPSC, on those areas of responsibility specified in Sections 6.5.2.7 and 6.5.2.8.

## RECORDS

6.5.2.10 Records of NSDRC activities shall be prepared, approved and distributed as indicated below:

a. Minutes of each NSDRC meeting shall be prepared, approved and forwarded to the Senior Executive Vice President, Engineering and Construction, AEPSC, within 14 days following each meeting.

b. Reports of reviews encompassed by Section 6.5.2.7 above, shall be prepared, approved and forwarded to the Senior Executive Vice President, Engineering and Construction, AEPSC, within 14 days following completion of the review.

c. Audit reports encompassed by Section 6.5.2.8 above, shall be forwarded to the Senior Executive Vice President, Engineering and Construction, AEPSC, and to the management positions responsible for the areas audited within 30 days after completion of the audit.

## 6.6 REPORTABLE OCCURRENCE ACTION

6.6.1 The following actions shall be taken for REPORTABLE OCCURRENCES:

a. The Commission shall be notified and/or a report submitted pursuant to the requirements of Specification 6.9.

b. Each REPORTABLE OCCURRENCE requiring 24 hour notification to the Commission shall be reviewed by the PNSRC and submitted to the NSDRC and the Vice President, Nuclear Engineering.