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

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 72
License No. NPF-30

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

   A. The application for amendment filed by Union Electric Company (UE, the licensee) dated January 14, 1992, complies 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 paragraph 2.C.(2) of Facility Operating License No. NPF-30 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 72 , and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into the license. UE shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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

FOR THE NUCLEAR REGULATORY COMMISSION

John N. Hannon

John N. Hannon, Director
Project Directorate III-3
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of issuance: August 5, 1992

ATTACHMENT TO LICENSE AMENDMENT NO. 72

OPERATING LICENSE NO. NPF-30

DOCKET NO. 50-483

Revise Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change. Corresponding overleaf pages are provided to maintain document completeness.

REMOVE	INSERT
2-8	2-8
3/4 2-1	3/4 2-1
3/4 2-2	3/4 2-2
3/4 2-2(a)	-
3/4 2-6	3/4 2-6
3/4 2-7	3/4 2-7
3/4 2-7(a)	3/4 2-7(a)
3/4 2-7(b)	3/4 2-7(b)
-	3/4 2-7(c)
-	3/4 2-8
6-21	6-21
6-21(a)	6-21(a)
B 3/4 2-1	B 3/4 2-1
B 3/4 2-2	B 3/4 2-2
B 3/4 2-3	B 3/4 2-3

TABLE NOTATIONS

NOTE 1: OVERTEMPERATURE ΔT

$$\Delta T \left(\frac{1 + \tau_1 S}{1 + \tau_2 S}\right)\left(\frac{1}{1 + \tau_3 S}\right) \leq \Delta T_o \{K_1 - K_2 \frac{(1 + \tau_4 S)}{(1 + \tau_5 S)}[T\left(\frac{1}{1 + \tau_6 S}\right) - T'] + K_3(P - P') - f_1(\Delta I)\}$$

Where:

- ΔT = Measured ΔT
- $\frac{1 + \tau_1 S}{1 + \tau_2 S}$ = Lead-lag compensator on measured ΔT;
- τ_1, τ_2 = Time constants utilized in lead-lag compensator for ΔT, $\tau_1 = 8$ s, $\tau_2 = 3$ s;
- $\frac{1}{1 + \tau_3 S}$ = Lag compensator on measured ΔT;
- τ_3 = Time constant utilized in the lag compensator for ΔT, $\tau_3 = 0$ s;
- ΔT_o = Indicated ΔT at RATED THERMAL POWER;
- K_1 = 1.15;
- K_2 = 0.0251/°F;
- $\frac{1 + \tau_4 S}{1 + \tau_5 S}$ = The function generated by the lead-lag compensator for T_{avg} dynamic compensation;
- τ_4, τ_5 = Time constants utilized in the lead-lag compensator for T_{avg}, $\tau_4 = 28$ s, $\tau_5 = 4$ s;
- T = Average temperature, °F;
- $\frac{1}{1 + \tau_6 S}$ = Lag compensator on measured T_{avg};
- τ_6 = Time constant utilized in the measured T_{avg} lag compensator, $\tau_6 = 0$ s;

TABLE 2.2-1 (Continued)

TABLE NOTATIONS (Continued)

NOTE 1: (Continued)

T' $\leq$ 588.4°F (Referenced T_{avg} at RATED THERMAL POWER);

K_3 = 0.00176;

p = Pressurizer pressure, psig;

p' = 2235 psig (Nominal RCS operating pressure);

S = Laplace transform operator, s^{-1};

and $f_1(\Delta I)$ is a function of the indicated difference between top and bottom detectors of the power-range neutron ion chambers; with gains to be selected based on measured instrument response during plant STARTUP tests such that:

(i) For $q_t - q_b$ between -24% and + 6%, $f_1(\Delta I) = 0$, where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER;

(ii) For each percent that $q_t - q_b$ is more negative than -24%, the ΔT Trip Setpoint shall be automatically reduced by 3.25% of its value at RATED THERMAL POWER; and

(iii) For each percent that the magnitude of $q_t - q_b$ exceeds +6%, the ΔT Trip Setpoint shall be automatically reduced by 1.89% of its value at RATED THERMAL POWER.

NOTE 2: The channel's maximum Trip Setpoint shall not exceed its computed Trip Setpoint by more than 2.3% of ΔT span.

3/4.2 POWER DISTRIBUTION LIMITS

3/4.2.1 AXIAL FLUX DIFFERENCE

LIMITING CONDITION FOR OPERATION

3.2.1 The indicated AXIAL FLUX DIFFERENCE (AFD) shall be maintained within:

a. The allowed operating space as specified in the CORE OPERATING LIMITS REPORT (COLR) for Relaxed Axial Offset Control (RAOC) operation, or

b. The target band specified in the COLR about the target flux difference during RESTRICTED AFD OPERATION (RAFDO).

APPLICABILITY: MODE 1 above 50% of RATED THERMAL POWER.*

ACTION:

a. For RAOC operation with the indicated AFD outside of the limits specified in the COLR,

1. Either restore the indicated AFD to within the COLR limits within 15 minutes, or

2. 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 less than or equal to 55% of RATED THERMAL POWER within the next 4 hours.

b. For RAFDO above APL^{ND}** with the indicated AFD outside of the applicable target band about the target flux difference:

1. Either restore the indicated AFD to within the COLR specified target band limits within 15 minutes, or

2. Reduce THERMAL POWER to less than APL^{ND} and discontinue RAFDO within 30 minutes.

c. THERMAL POWER shall not be increased above 50% of RATED THERMAL POWER unless the indicated AFD is within the limits specified in the COLR.

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* See Special Test Exception 3.10.2.

** APL^{ND} is the minimum allowable (nuclear design) power level for RESTRICTED AFD OPERATION and is specified in the CORE OPERATING LIMITS REPORT per Specification 6.9.1.9.

SURVEILLANCE REQUIREMENTS

4.2.1.1 The indicated AFD shall be determined to be within its limits during POWER OPERATION above 50% 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 AFD 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 AFD Monitor Alarm is inoperable. The logged values of the indicated AFD shall be assumed to exist during the interval preceding each logging.

4.2.1.2 The indicated AFD shall be considered outside of its limits when at least two OPERABLE excore channels are indicating the AFD to be outside the limits.

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. 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 in conjunction with the surveillance requirements of Specification 3/4.2.2 or by linear interpolation between the most recently measured value and the calculated value at the end of the cycle life. The provisions of Specification 4.0.4 are not applicable.

FIGURE 3.2-2

DELETED

SURVEILLANCE REQUIREMENTS

4.2.2.1 The provisions of Specification 4.0.4 are not applicable.

4.2.2.2 For Normal Operation, $F_Q(z)$ shall be evaluated to determine if $F_Q(z)$ is within its limits 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 $F_Q(z)$ 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. Verify that the requirements of Specification 3.2.2 are satisfied.

c. Satisfying the following relationship:

$$F_Q^M(Z) \leq \frac{F_Q^{RTP} \times K(Z)}{P \times W(Z)_{NO}} \text{ for } P > 0.5$$

$$F_Q^M(Z) \leq \frac{F_Q^{RTP} \times K(Z)}{W(Z)_{NO} \times 0.5} \text{ for } P \leq 0.5$$

where $F_Q^M(Z)$ is the measured $F_Q(Z)$ increased by the allowances for manufacturing tolerances and measurement uncertainty, F_Q^{RTP} is the F_Q limit, $K(Z)$ is the normalized $F_Q(Z)$ as a function of core height, P is the relative THERMAL POWER, and $W(Z)_{NO}$ is the cycle dependent, Normal Operation function that accounts for power distribution transients encountered during Normal Operation. F_Q^{RTP}, $K(Z)$ and $W(Z)_{NO}$ are specified in the Core Operating Limits Report as per Specification 6.9.1.9.

d. Measuring $F_Q^M(z)$ according to the following schedule:

1. Upon achieving equilibrium conditions after exceeding, by 10% or more of RATED THERMAL POWER, the THERMAL POWER at which $F_Q(z)$ was last determined,* or

2. At least once per 31 Effective Full Power Days (EFPD), whichever occurs first.

*During power escalation at the beginning of each cycle, power level may be increased until a power level for extended operation (expected operation at a power level for greater than 72 hours) has been achieved after which a power distribution map will be obtained.

SURVEILLANCE REQUIREMENTS (Continued)

4.2.2.2 (Continued)

e. With measurements indicating

$$\text{maximum over } z \left(\frac{F_Q^M(z)}{K(z)} \right)$$

has increased since the previous determination of $F_Q^M(z)$, either of the following actions shall be taken:

1. $F_Q^M(z)$ shall be increased by 2% over that specified in Specification 4.2.2.2c., or

2. $F_Q^M(z)$ shall be measured at least once per 7 Effective Full Power Days until two successive maps indicate that

$$\text{maximum over } z \left(\frac{F_Q^M(z)}{K(z)} \right) \text{ is not increasing.}$$

f. With the relationships specified in Specification 4.2.2.2c. above not being satisfied:

1. Calculate the percent $F_Q(z)$ exceeds its limit by the following expression:

$$\left[\left(\text{max. over } z \text{ of } \frac{F_Q^M(z) \times W(z)\ NO}{\frac{F_Q^{RTP}}{P} \times K(z)} \right) - 1 \right] \times 100 \text{ for } P \geq 0.5$$

$$\left[\left(\text{max. over } z \text{ of } \frac{F_Q^M(z) \times W(z)\ NO}{\frac{F_Q^{RTP}}{0.5} \times K(z)} \right) - 1 \right] \times 100 \text{ for } P < 0.5$$

2. Either one of the following actions shall be taken:

(a) Within 15 minutes, control the AFD to within new AFD limits which are determined by tightening both the negative and positive AFD limits of Specification 3.2.1 by 1% AFD for each percent $F_Q(z)$ exceeds its limits as determined in Specification 4.2.2.2.f.1. Within 8 hours reset the AFD alarm setpoints to these modified limits, or

(b) Comply with the requirements of Specification 3.2.2 for $F_Q(z)$ exceeding its limit by the percent calculated above, or

(c) Verify that the requirements of Specification 4.2.2.3 for RESTRICTED AFD OPERATION are satisfied and enter RESTRICTED AFD OPERATION.

SURVEILLANCE REQUIREMENTS (Continued)

4.2.2.2 (Continued)

g. The limits specified in Specifications 4.2.2.2.c, 4.2.2.2.e, and 4.2.2.2.f above are not applicable in the following core plane regions:

1. Lower core region from 0 to 15%, inclusive.

2. Upper core region from 85 to 100%, inclusive.

4.2.2.3 RESTRICTED AFD OPERATION (RAFDO) is permitted at powers above APL^{ND*} if the following conditions are satisfied:

a. Prior to entering RAFDO, maintain THERMAL POWER above APL^{ND} and less than or equal to that allowed by Specification 4.2.2.2 for at least the previous 24 hours. Maintain RAFDO surveillance (AFD within the limits specified in the COLR) during this time period. RAFDO is then permitted providing THERMAL POWER is maintained between APL^{ND} and APL^{RAFDO} or between APL^{ND} and 100% (whichever is more limiting) and F_Q surveillance is maintained pursuant to Specification 4.2.2.4. APL^{RAFDO} is defined as:

$$APL^{RAFDO} = \text{minimum over } z \left\{ \frac{F_Q^{RTP} \times K(Z)}{F_Q^M(Z) \times W(Z)_{RAFDO}} \right\} \times 100\%$$

where $F_Q^M(Z)$ is the measured $F_Q(Z)$ increased by the allowances for manufacturing tolerances and measurement uncertainty. The F_Q limit is F_Q^{RTP}. $K(Z)$ is the normalized $F_Q(Z)$ as a function of core height. $W(Z)_{RAFDO}$ is the cycle dependent function that accounts for limited power distribution transients encountered during RAFDO. F_Q^{RTP}, $K(Z)$, and $W(Z)_{RAFDO}$ are specified in the Core Operating Limits Report as per Specification 6.9.1.9.

b. During RAFDO, if the THERMAL POWER is decreased below APL^{ND} then the conditions of 4.2.2.3.a. shall be satisfied before re-entering RAFDO.

4.2.2.4 During RAFDO, $F_Q(Z)$ shall be evaluated to determine if $F_Q(Z)$ is within its limits by:

a. Using the movable incore detectors to obtain a power distribution map at any THERMAL POWER above APL^{ND}.

*APL^{ND} is the minimum allowable (nuclear design) power level for RESTRICTED AFD OPERATION in Specification 3.2.1 and specified in the Core Operating Limits Report as per Specification 6.9.1.9.

SURVEILLANCE REQUIREMENTS (Continued)

4.2.2.4 (Continued)

b. Increasing the measured $F_Q(Z)$ 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. Verify that the requirements of Specification 3.2.2 are satisfied.

c. Satisfying the following relationship:

$$F_Q^M(Z) \leq \frac{F_Q^{RTP} \times K(Z)}{P \times W(Z)_{RAFDO}} \quad \text{for } P > APL^{ND}$$

where $F_Q^M(Z)$ is the measured $F_Q(Z)$ increased by the allowances for manufacturing tolerances and measurement uncertainty. $K(Z)$ is the normalized $F_Q(Z)$ as a function of core height. The F_Q limit is F_Q^{RTP}. P is the relative THERMAL POWER. $W(Z)_{RAFDO}$ is the cycle dependent function that accounts for limited power distribution transients encountered during RAFDO. F_Q^{RTP}, $K(Z)$, and $W(Z)_{RAFDO}$ are specified in the Core Operating Limits Report as per Specification 6.9.1.9.

d. Measuring $F_Q^M(z)$ in conjunction with target flux difference determination according to the following schedule:

1. Prior to entering RAFDO after satisfying Section 4.2.2.3 unless a full core flux map has been taken in the previous 31 EFPD with the relative thermal power having been maintained above APL^{ND} for the 24 hours prior to mapping, and

2. At least once per 31 Effective Full Power Days.

e. With measurements indicating

$$\text{maximum over } z \left[\frac{F_Q^M(z)}{K(z)} \right]$$

has increased since the previous determination of $F_Q^M(z)$ either of the following actions shall be taken:

1. $F_Q^M(z)$ shall be increased by 2 percent over that specified in 4.2.2.4.c, or

SURVEILLANCE REQUIREMENTS (Continued)

4.2.2.4 (Continued)

2. $F_Q^M(z)$ shall be measured at least once per 7 EFPD until two successive maps indicate that

$$\text{maximum over } z \left[\frac{F_Q^M(z)}{K(z)}\right] \text{ is not increasing.}$$

f. With the relationship specified in 4.2.2.4.c above not being satisfied, either of the following actions shall be taken:

1. Place the core in an equilibrium condition where the limit in 4.2.2.2.c is satisfied, and remeasure $F_Q^M(z)$, or

2. Comply with the requirements of Specification 3.2.2 for $F_Q(z)$ exceeding its limit by the percent calculated with the following expression:

$$\left[\left(\text{max. over } z \text{ of } \left(\frac{F_Q^M(z) \times W(z)_{RAFDO}}{F_Q^{RTP} \times K(z)}\right)\right) \frac{}{P} - 1\right] \times 100 \text{ for } P \geq APL^{ND}$$

g. The limits specified in 4.2.2.4.c, 4.2.2.4.e, and 4.2.2.4.f above are not applicable in the following core plane regions:

1. Lower core region from 0 to 15 percent, inclusive.

2. Upper core region from 85 to 100 percent, inclusive.

4.2.2.5 When $F_Q(z)$ is measured for reasons other than meeting the requirements of Specification 4.2.2.2 or 4.2.2.4, an overall measured $F_Q(z)$ shall be obtained from a power distribution map and increased by 3% to account for manufacturing tolerances and further increased by 5% to account for measurement uncertainty.

POWER DISTRIBUTION LIMITS

3/4.2.3 NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR - $F^N_{\Delta H}$

LIMITING CONDITION FOR OPERATION

3.2.3 $F^N_{\Delta H}$ shall be limited by the following relationship:

$$F^N_{\Delta H} \leq F^{RTP}_{\Delta H} [1 + PF_{\Delta H} (1-P)]$$

where: $F^{RTP}_{\Delta H}$ = The $F^N_{\Delta H}$ limit at RATED THERMAL POWER (RTP) specified in the Core Operating Limits Report (COLR). $PF_{\Delta H}$ = the Power Factor Multiplier for $F^N_{\Delta H}$ specified in the COLR.

$$P = \frac{\text{THERMAL POWER}}{\text{RATED THERMAL POWER}}$$

$F^N_{\Delta H}$ = Measured values of $F^N_{\Delta H}$ obtained by using the movable incore detectors to obtain a power distribution map. The measured values of $F^N_{\Delta H}$ shall be used since an uncertainty of 4% for incore measurement of $F^N_{\Delta H}$ has been included in the above limit.

APPLICABILITY: MODE 1

ACTION:

With $F^N_{\Delta H}$ exceeding its limit:

a. Within 2 hours either:

1. Restore the $F^N_{\Delta H}$ to within the above limits, or

2. Reduce THERMAL POWER TO LESS THAN 50% of RATED THERMAL POWER and reduce the Power Range Neutron Flux-High Trip Setpoint to $\leq$ 55% of RATED THERMAL POWER within the next 4 hours.

b. Demonstrate through in-core flux mapping that $F^N_{\Delta H}$ is within its limit within 24 hours after exceeding the limit or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 2 hours, and

c. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER above the reduced limit required by a or b, above; subsequent POWER OPERATION may proceed provided that $F^N_{\Delta H}$ is demonstrated through in-core flux mapping to be within its limit at a nominal 50% of RATED THERMAL POWER prior to exceeding this THERMAL POWER, at a nominal 75% of RATED THERMAL POWER prior to exceeding this THERMAL power and within 24 hours after attaining 95% or greater RATED THERMAL POWER.

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: (1) maintaining the minimum DNBR in the core at or above the safety analysis DNBR limits during normal operation and in short-term transients, and (2) 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 met and the ECCS acceptance criteria limit of 2200°F is not exceeded.

The definition of certain hot channel and peaking 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; and

$F^N_{\Delta H}$ 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

The limits on AXIAL FLUX DIFFERENCE (AFD) assure that the $F_Q(Z)$ upper bound envelopes of the F_Q limit specified in the Core Operating Limits Report (COLR) times the normalized axial peaking factor are not exceeded during either normal operation or in the event of xenon redistribution following power changes.

Target flux difference is determined at equilibrium xenon conditions. 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.

At power levels below APL^{ND}, the limits on AFD are specified in the COLR for RAOC operation. These limits were calculated in a manner such that expected operational transients, e.g., load follow operations, would not result in the AFD deviating outside of those limits. However, in the event such a deviation occurs, the 15 minute period of time allowed outside

3/4.2.1 AXIAL FLUX DIFFERENCE (Continued)

of the limits at reduced power levels will not result in significant xenon redistribution such that the envelope of peaking factors would change sufficiently to prevent operation in the vicinity of the APL^{ND} power level.

At power levels greater than APL^{ND}, two modes of operation are permissible: 1) RAOC with fixed AFD limits as a function of reactor power level, and 2) Restricted AFD Operation (RAFDO) which is defined as the maintenance of the AFD within a band about a target value. Both the fixed AFD limits for RAOC operation and the target band for RAFDO are specified in the COLR. RAOC operations above APL^{ND} are the same as for operation below APL^{ND}. However, it is possible when following extended load following maneuvers that the AFD limits may result in restrictions in the maximum allowed power or AFD in order to guarantee operation with $F_Q(Z)$ less than its limiting value. To allow operation at the maximum permissible value, the RAFDO operating procedure restricts the indicated AFD to a relatively small target band and does not allow significant changes in power level (i.e., power maintained between APL^{ND} and either APL^{RAFDO} or 100% RTP, whichever is less). For RAFDO, it is expected that the plant will operate within the target band. Operation outside of the target band for the short time period allowed (15 minutes) will not result in significant xenon redistribution such that the envelope of peaking factors would change sufficiently to prohibit continued operation in the power region defined above. To assure there is no residual xenon redistribution impact for past operation on the RAFDO operation, prior to entering RAFDO a 24-hour waiting period at a power level above APL^{ND} and less than or equal to that allowed by Specification 4.2.2.2 is necessary. During this time period, load changes and control rod motion are restricted to that allowed by the RAFDO procedure. After the waiting period, extended RAFDO is permissible.

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 one-minute average AFD for at least two OPERABLE excore channels are: 1) outside the allowed delta-I vs. power operating space (for RAOC operation), or (2) outside the acceptable AFD target band (for RAFDO). These alarms are active when power is greater than: 1) 50% of RATED THERMAL POWER (for RAOC operation), or 2) APL^{ND} (for RAFDO). Penalty deviation minutes for RAFDO are not accumulated based on the short period of time during which operation outside of the target band is allowed.

3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR and NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

The limits on heat flux hot channel factor and nuclear enthalpy rise hot channel factor ensure that 1) the design limits on peak local power density and minimum DNBR are not exceeded, and 2) in the event of a LOCA the peak fuel clad temperature will not exceed the 2200°F ECCS acceptance criteria limit.

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3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR (Continued)

Each of these is measurable but will normally only be determined periodically as specified in Specifications 4.2.2 and 4.2.3. This periodic surveillance is sufficient to ensure that the limits are maintained provided:

a. Control rods in a single group move together with no individual rod insertion differing by more than ± 12 steps, indicated, from the group demand position.

b. Control rod banks are sequenced with overlapping groups as described in Specification 3.1.3.6.

c. The control rod insertion limits of Specification 3.1.3.6 are maintained.

d. The axial power distribution, expressed in terms of AXIAL FLUX DIFFERENCE, is maintained within the limits.

$F^N_{\Delta H}$ will be maintained within its limits provided conditions a. through d. above are maintained. The relaxation of $F^N_{\Delta H}$ as a function of THERMAL POWER allows changes in the radial power shape for all permissible rod insertion limits.

When an F_Q measurement is taken, an allowance for both experimental error and manufacturing tolerance must be made. An allowance of 5% is appropriate for a full-core map taken with the incore detector flux mapping system and a 3% allowance is appropriate for manufacturing tolerance.

When $F^N_{\Delta H}$ is measured (i.e., inferred), no additional allowances are necessary prior to comparison with the limits of Section 3.2.3. An error allowance of 4% has been included in the limits of Section 3.2.3.

Specifications 3.2.2 and 3.2.3 contain the F_Q and F-delta-H limits applicable to VANTAGE 5 fuel. The OFA fuel is analyzed to lower limits since it will have experienced burnup, thereby reducing the attainable OFA-specific hot channel factors such that the expected peak power levels and peak radial power of the OFA fuel will be much less than that necessary to approach the OFA F_Q and F-delta-H analysis limits.

Margin between the safety analysis DNBR limits (1.42 and 1.45 for the Optimized fuel thimble and typical cells, respectively, and 1.61 and 1.69 for the VANTAGE 5 thimble and typical cells) and the design DNBR limits (1.33 and 1.35 for the Optimized fuel thimble and typical cells and 1.33 and 1.34 for the VANTAGE 5 thimble and typical cells, respectively) is maintained. A fraction of this margin is utilized to accommodate the transition core DNBR penalty

MONTHLY OPERATING REPORT

6.9.1.8 Routine reports of operating statistics and shutdown experience, including documentation of all challenges to the pressurizer PORVs or RCS safety valves, shall be submitted on a monthly basis to the Director, Office of Resource Management, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, with a copy to the NRC Regional Office, no later than the 15th of each month following the calendar month covered by the report.

CORE OPERATING LIMITS REPORT

6.9.1.9 Core operating limits shall be established and documented in the CORE OPERATING LIMITS REPORT prior to each reload cycle, or prior to any remaining portion of a reload cycle, for the following:

a. Moderator Temperature Coefficient BOL and EOL limits and 300 ppm surveillance limit for Specification 3/4.1.1.3,

b. Shutdown Bank Insertion Limit for Specification 3/4.1.3.5,

c. Control Bank Insertion Limits for Specification 3/4.1.3.6,

d. Axial Flux Difference Limits, RAFDO target band, and APL^{ND} for Specification 3/4.2.1,

e. Heat Flux Hot Channel Factor, F_Q^{RTP}, $K(Z)$, $W(Z)_{ND}$, APL^{ND} and $W(Z)_{RAFDO}$ (as required) for Specification 3/4.2.2,

f. Nuclear Enthalpy Rise Hot Channel Factor $F_{\Delta H}$, and Power Factor Multiplier, $PF_{\Delta H}$, limits for Specification 3/4.2.3.

The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents.

a. WCAP-9272-P-A, "WESTINGHOUSE RELOAD SAFETY EVALUATION METHODOLOGY", July 1985 (W Proprietary).

(Methodolngy for Specification 3.1.1.3 - Moderator Temperature Coefficient; 3.1.3.5 - Shutdown Bank Insertion Limit; 3.1.3.6 - Control Bank Insertion Limit; and 3.2.3 - Nuclear Enthalpy Rise Hot Channel Factor.)

b. WCAP-10216-P-A, "RELAXATION OF CONSTANT AXIAL OFFSET CONTROL AND FQ SURVEILLANCE TECHNICAL SPECIFICATION," June 1983 (W Proprietary).

(Methodology for Specification 3.2.1 - Axial Flux Difference (Relaxed Axial Offset Control) and 3.2.2 - Heat Flux Hot Channel Factor (W(Z) surveillance requirements of F_Q Methodology)

c. WCAP-10266-P-A, REV. 2, "THE 1981 VERSION OF WESTINGHOUSE EVALUATION MODEL USING BASH CODE," March 1987 (W Proprietary).

(Methodology for Specification 3.2.2. - Heat Flux Hot Channel Factor).

The core operating limits shall be determined so that all applicable limits (e.g., fuel thermal-mechanical limits, core thermalhydraulic limits, nuclear limits such as shutdown margin, and transient and accident analysis limits) of the safety analysis are met.

The CORE OPERATING LIMITS REPORT, including any mid-cycle revisions or supplements shall be provided, upon issuance for each reload cycle, to the NRC Document Control Desk with copies to the Regional Administrator and Resident Inspector.

SPECIAL REPORTS

6.9.2 Special Reports shall be submitted to the Regional Administrator of the NRC Regional Office within the time period specified for each report.

6.10 RECORD RETENTION

In addition to the applicable record retention requirements of Title 10, Code of Federal Regulations, the following records shall be retained for at least the minimum period indicated.

6.10.1 The following records shall be retained for at least 5 years:

a. Records and logs of unit operation covering time interval at each power level;