Docket Nos. 50-269
50-270
and 50-287

OCT 3 1 1975

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Duke Power Company
ATTN: Mr. William O. Parker, Jr.
Vice President
Steam Production
Post Office Box 2178
422 South Church Street
Charlotte, North Carolina 28242

Gentlemen:

The Commission has issued the enclosed Amendment No.13, Technical Specification Change No. 23 for License No. DPR-38; Amendment No.13, Technical Specification Change No. 18 for License No. DPR-47; and Amendment No.10, Technical Specification Change No.10 for License No. DPR-55, for the Oconee Nuclear Station, Units 1, 2, and 3. These amendments are in response to your request dated August 26, 1975.

These amendments (1) modify the axial power imbalance limits for the Core Protection Safety Limits and the Reactor Protection System Maximum Allowable Setpoints, (2) reduce the flux/flow ratio from 1.07 to 0.961 for single-loop operation, and (3) change the maximum thermal power for three-pump operation from 86.0% to 86.4%.

Copies of the related Safety Evaluation and the Federal Register Notice are also enclosed.

Sincerely,

Original signed by
R. A. Purple

Robert A. Purple, Chief
Operating Reactors Branch #1
Division of Reactor Licensing

Enclosures:
1. Amendment No. 13 to DPR-38
2. Amendment No. 13 to DPR-47
3. Amendment No. 10 to DPR-55
4. Safety Evaluation
5. Federal Register Notice

cc w/enclosures:
See next page

Court

OFFICE ➤	RL:ORB#1	TR:CPB	OELD	RL:ORB#1		
SURNAME ➤	GGZech:dc	DRoss		RAPurple		
DATE ➤	10/30/75	10/ /75	10/ /75	10/ /75		

 OCT 31 1975

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Honorable Reese A. Hubbard
County Supervisor of Oconee County
Walhalla, South Carolina 29621

cc w/enclosures & incoming:
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State Clearinghouse
Office of the Governor
Division of Administration
1295 Pendleton Street
4th Floor
Columbia, South Carolina 29201

Mr. Dave Hopkins
Environmental Protection Agency
1421 Peachtree Street, NE
Atlanta, Georgia 30309

UNITED STATES

NUCLEAR REGULATORY COMMISSION

WASHINGTON, D. C. 20555

DUKE POWER COMPANY

DOCKET NO. 50-269

OCONEE NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 13
License No. DPR-38

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

   A. The application for amendment by Duke Power Company (the licensee) dated August 26, 1975, 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; and

   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.

2. Accordingly, the license is amended by a change to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 3.B of Facility License No. DPR-38 is hereby amended to read as follows:

" B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, as revised by issued changes thereto through Change No. 23."

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

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by
R. A. Purple

Robert A. Purple, Chief
Operating Reactors Branch #1
Division of Reactor Licensing

Attachment:
Change No. 23 to the
Technical Specifications

Date of Issuance: OCT 31 1975

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

DUKE POWER COMPANY

DOCKET NO. 50-270

OCONEE NUCLEAR STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 13
License No. DPR-47

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

   A. The application for amendment by Duke Power Company (the licensee) dated August 26, 1975, 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; and

   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.

2. Accordingly, the license is amended by a change to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 3.B of Facility License No. DPR-47 is hereby amended to read as follows:

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

"B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, as revised by issued changes thereto through Change No. 18."

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

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by
R. A. Purple

Robert A. Purple, Chief
Operating Reactors Branch #1
Division of Reactor Licensing

Attachment:
Change No. 18 to the
Technical Specifications

Date of Issuance: OCT 31 1975

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

DUKE POWER COMPANY

DOCKET NO. 50-287

OCONEE NUCLEAR STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 10
License No. DPR-55

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

   A. The application for amendment by Duke Power Company (the licensee) dated August 26, 1975, 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; and

   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.

2. Accordingly, the license is amended by a change to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 3.B of Facility License No. DPR-55 is hereby amended to read as follows:

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

"B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, as revised by issued changes thereto through Change No. 10 ."

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

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by
R. A. Purple

Robert A. Purple, Chief
Operating Reactors Branch #1
Division of Reactor Licensing

Attachment:
Change No. 10 to the
Technical Specifications

Date of Issuance: OCT 31 1975

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 13 TO FACILITY LICENSE NO. DPR-38
CHANGE NO. 23 TO TECHNICAL SPECIFICATIONS;

AMENDMENT NO. 13 TO FACILITY LICENSE NO. DPR-47
CHANGE NO. 18 TO TECHNICAL SPECIFICATIONS;

AMENDMENT NO. 10 TO FACILITY LICENSE NO. DPR-55
CHANGE NO. 10 TO TECHNICAL SPECIFICATIONS

DOCKET NOS. 50-269, 50-270 AND 50-287

Revise Appendix A as follows:

Remove pages 2.1-3b, 2.1-8, 2.1-9, 2.3-1, 2.3-2, 2.3-3, 2.3-4, 2.3-9, 2.3-10, 2.3-12, and 2.3-13; and insert identically numbered pages.

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SURNAME ➤						
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Power peaking is not a directly observable quantity and therefore limits have been established on the bases of the reactor power imbalance produced by the power peaking.

The specified flow rates for Curves 1, 2, 3, and 4 of Figure 2.1-2B correspond
2.1-2C
to the expected minimum flow rates with four pumps, three pumps, one pump in each loop and two pumps in one loop, respectively.

The curve of Figure 2.1-1B is the most restrictive of all possible reactor
2.1-1C
coolant pump-maximum thermal power combinations shown in Figure 2.1-3B.
2.1-3C

The curves of Figure 2.1-3B represent the conditions at which a minimum DNBR
2.1-3C
of 1.3 is predicted at the maximum possible thermal power for the number of reactor coolant pumps in operation or the local quality at the point of minimum DNBR is equal to 15%,(3) whichever condition is more restrictive.

Using a local quality limit of 15 percent at the point of minimum DNBR as a basis for Curves 2 and 4 of Figure 2.1-3B is a conservative criterion even
2.1-3C
though the quality of the exit is higher than the quality at the point of minimum DNBR.

The DNBR as calculated by the W-3 correlation continually increases from point of minimum DNBR, so that the exit DNBR is 1.7 or higher, depending on the pressure. Extrapolation of the W-3 correlation beyond its published quality range of +15 percent is justified on the basis of experimental data.(4)

2 3
The maximum thermal power for three pump operation is 86.4% - Unit 2 1 8
86.4% - Unit 3 1 0
due to a power level trip produced by the flux-flow ratio 75% flow x 1.07 = 80%
1.07 = 80%
power

plus the maximum calibration and instrument error. The maximum thermal power for other coolant pump conditions are produced in a similar manner. A flux-flow 2 3
ratio of 0.961 is used for single loop conditions. 1 8
For each curve of Figure 2.1-3B, a pressure-temperature point above and to the 1 0
2.1-3C
left of the curve would result in a DNBR greater than 1.3 or a local quality at the point of minimum DNBR less than 15 percent for that particular reactor coolant pump situation. The 1.3 DNBR curve for four-pump operation is more restrictive than any other reactor coolant pump situation because any pressure/temperature point above and to the left of the four-pump curve will be above and to the left of the other curves.

<u>REFERENCES</u>

(1) FSAR, Section 3.2.3.1.1
(2) FSAR, Section 3.2.3.1.1.c
(3) FSAR, Section 3.2.3.1.1.k

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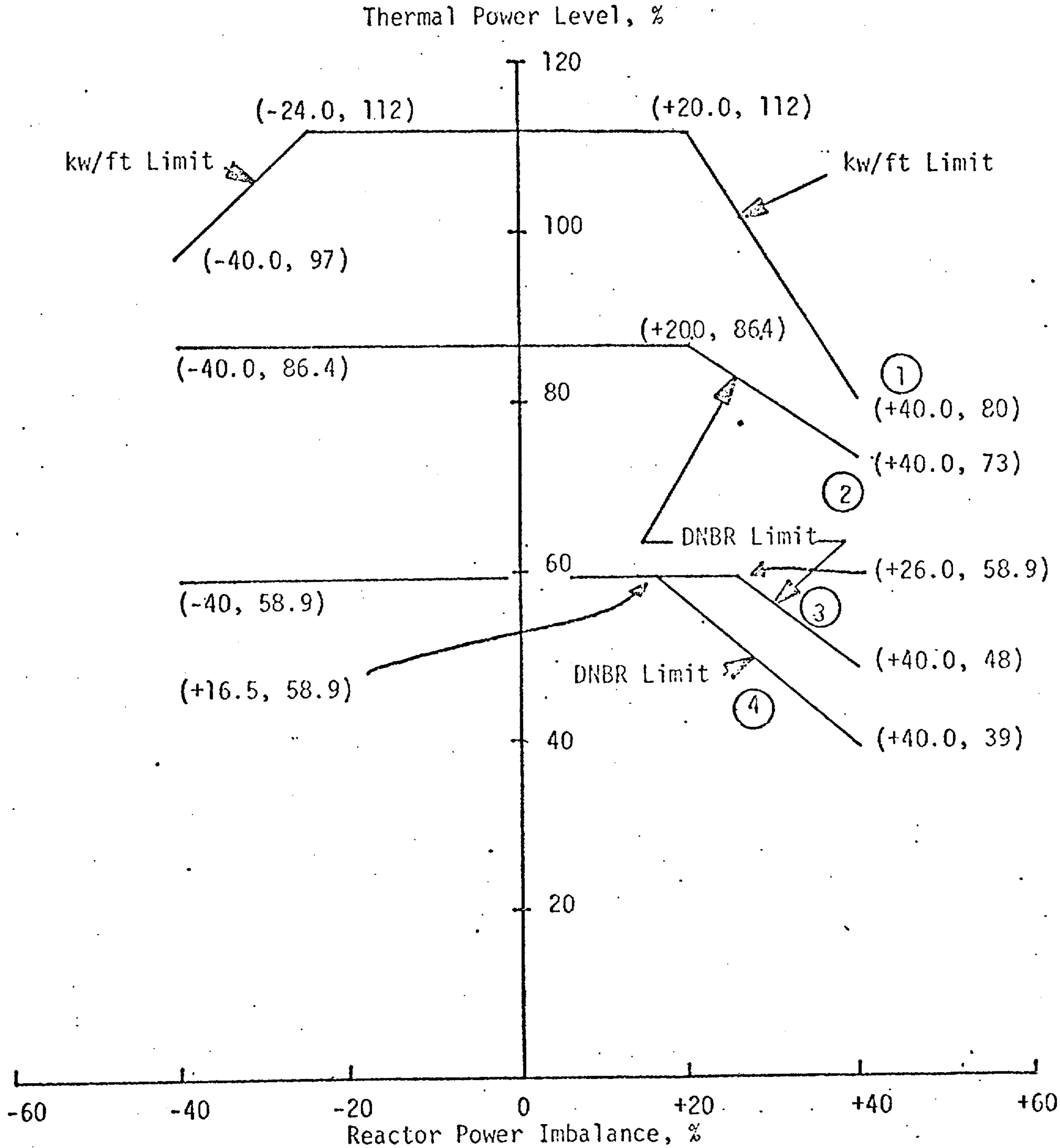


CURVE	REACTOR COOLANT FLOW (LB/HR)
1	131.3×10^6
2	98.1×10^6
3	64.4×10^6
4	60.1×10^6

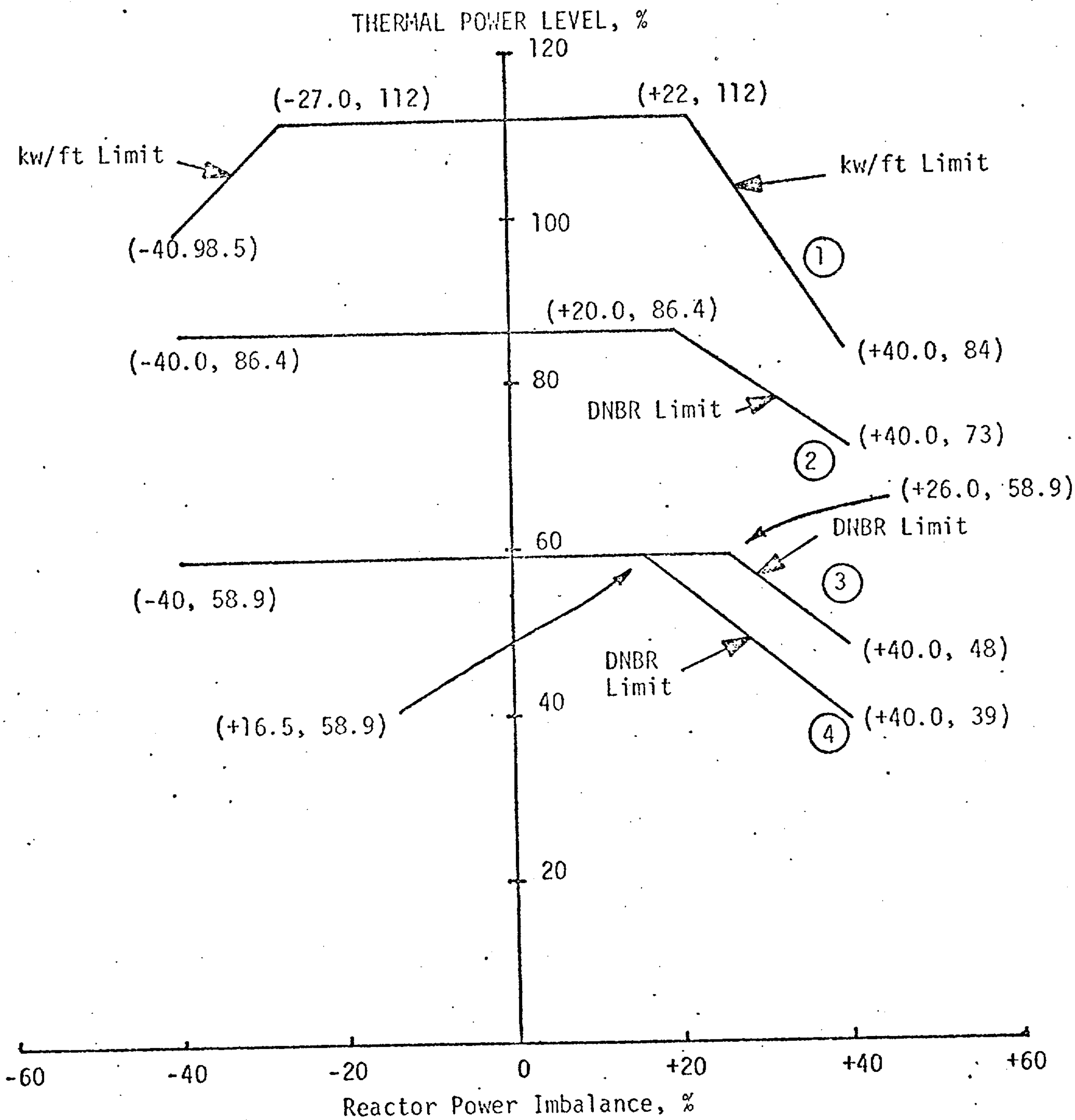
CORE PROTECTION SAFETY LIMITS

UNIT 2

OCONEE NUCLEAR STATION

Figure 2.1-2B

OCT 3 1 1975



CURVE	REACTOR COOLANT FLOW (LB/HR)
1	131.3×10^6
2	98.1×10^6
3	64.4×10^6
4	60.1×10^6

CORE PROTECTION SAFETY LIMITS

UNIT 3

OCONEE NUCLEAR STATION

Figure 2.1-2C

OCT 3 1 197_

2.3 LIMITING SAFETY SYSTEM SETTINGS, PROTECTIVE INSTRUMENTATION

Applicability

Applies to instruments monitoring reactor power, reactor power imbalance, reactor coolant system pressure, reactor coolant outlet temperature, flow, number of pumps in operation, and high reactor building pressure.

Objective

To provide automatic protective action to prevent any combination of process variables from exceeding a safety limit.

Specification

The reactor protective system trip setting limits and the permissible bypasses for the instrument channels shall be as stated in Table 2.3-1A - Unit 1 and
2.3-1B - Unit 2
2.3-1C - Unit 3

Figure 2.3-2A1, 2.3-2A2 } Unit 1
2.3-2B - Unit 2
2.3-2C - Unit 3

The pump monitors shall produce a reactor trip for the following conditions:

a. Loss of two pumps and reactor power level is greater than 55% (0.0% for Unit 1) of rated power.

b. Loss of two pumps in one reactor coolant loop and reactor power level is greater than 0.0% of rated power. (Power/RC pump trip setpoint is reset to 55% of rated power for single loop operation and for Units 2 and 3, the flux-flow setpoint must be set at 0.961 prior to single loop operation. Power/RC pump trip setpoint is reset to 55% for all modes of 2 pump operation for Unit 1.) 23 18 10

c. Loss of one or two pumps during two-pump operation.

Bases

The reactor protective system consists of four instrument channels to monitor each of several selected plant conditions which will cause a reactor trip if any one of these conditions deviates from a pre-selected operating range to the degree that a safety limit may be reached.

The trip setting limits for protective system instrumentation are listed in Table 2.3-1A - Unit 1. The safety analysis has been based upon these protective
2.3-1B - Unit 2
2.3-1C - Unit 3
system instrumentation trip set points plus calibration and instrumentation errors.

Nuclear Overpower

A reactor trip at high power level (neutron flux) is provided to prevent damage to the fuel cladding from reactivity excursions too rapid to be detected by pressure and temperature measurements.

OCT 31 197_

During normal plant operation with all reactor coolant pumps operating, reactor trip is initiated when the reactor power level reaches 105.5% of rated power. Adding to this the possible variation in trip setpoints due to calibration and instrument errors, the maximum actual power at which a trip would be actuated could be 112%, which is more conservative than the value used in the safety analysis.(4)

Overpower Trip Based on Flow and Imbalance

The power level trip set point produced by the reactor coolant system flow is based on a power-to-flow ratio which has been established to accommodate the most severe thermal transient considered in the design, the loss-of-coolant flow accident from high power. Analysis has demonstrated that the specified power-to-flow ratio is adequate to prevent a DNBR of less than 1.3 should a low flow condition exist due to any electrical malfunction.

The power level trip set point produced by the power-to-flow ratio provides both high power level and low flow protection in the event the reactor power level increases or the reactor coolant flow rate decreases. The power level trip set point produced by the power-to-flow ratio provides overpower DNB protection for all modes of pump operation. For every flow rate there is a maximum permissible power level, and for every power level there is a minimum permissible low flow rate. Typical power level and low flow rate combinations for the pump situations of Table 2.3-1A are as follows:

1. Trip would occur when four reactor coolant pumps are operating if power is 108% and reactor flow rate is 100%, or flow rate is 93% and power level is 100%.

2. Trip would occur when three reactor coolant pumps are operating if power is 81.0% and reactor flow rate is 74.7% or flow rate is 69% and power level is 75%.

3. Trip would occur when two reactor coolant pumps are operating in a single loop if power is 59% and the operating loop flow rate is 54.5% or flow rate is 43% and power level is 46%. (For Tables 2.3-1B and 2.3-1C the values 23
are 52% power if the operating loop flow rate is 54.5% or flow rate is 48% 18
and power level is 46%.) 10

4. Trip would occur when one reactor coolant pump is operating in each loop (total of two pumps operating) if the power is 53% and reactor flow rate is 49.0% or flow rate is 45% and the power level is 49%.

For safety calculations the maximum calibration and instrumentation errors for the power level trip were used.

The power-imbalance boundaries are established in order to prevent reactor thermal limits from being exceeded. These thermal limits are either power peaking kw/ft limits or DNBR limits. The reactor power imbalance (power in the top half of core minus power in the bottom half of core) reduces the power level trip produced by the power-to-flow ratio such that the boundaries of Figure 2.3-2A1 }Unit 1 are produced. The power-to-flow ratio reduces the power
2.3-2A2
2.3-2B - Unit 2
2.3-2C - Unit 3

OCT 31 1975

level trip and associated reactor power/reactor power-imbalance boundaries by
1.08% - Unit 1 for a 1% flow reduction.
1.07% - Unit 2
1.07% - Unit 3 2 3
For Units 2 and 3, the power-to-flow reduction factor is 0.961 during single 1 8
loop operation. 1 0

Pump Monitors

The pump monitors prevent the minimum core DNBR from decreasing below 1.3 by tripping the reactor due to the loss of reactor coolant pump(s). The circuitry monitoring pump operational status provides redundant trip protection for DNB by tripping the reactor on a signal diverse from that of the power-to-flow ratio. The pump monitors also restrict the power level for the number of pumps in operation.

Reactor Coolant System Pressure

During a startup accident from low power or a slow rod withdrawal from high power, the system high pressure set point is reached before the nuclear overpower trip set point. The trip setting limit shown in Figure 2.3-1A - Unit 1
2.3-1B - Unit 2
2.3-1C - Unit 3
for high reactor coolant system pressure (2355 psig) has been established to maintain the system pressure below the safety limit (2750 psig) for any design transient.(1)

The low pressure (1985) psig and variable low pressure ($13.77\,T_{out} - 6181$) trip
(1800) psig ($16.25\,T_{out} - 7756$)
(1800) psig ($16.25\,T_{out} - 7756$)
setpoints shown in Figure 2.3-1A have been established to maintain the DNB
2.3-1B
2.3-1C
ratio greater than or equal to 1.3 for those design accidents that result in a pressure reduction.(2,3)

Due to the calibration and instrumentation errors the safety analysis used a variable low reactor coolant system pressure trip value of ($13.77\,T_{out} - 6221$)
($16.25\,T_{out} - 7796$)
($16.25\,T_{out} - 7796$)

Coolant Outlet Temperature

The high reactor coolant outlet temperature trip setting limit (619 F) shown in Figure 2.3-1A has been established to prevent excessive core coolant
2.3-1B
2.3-1C
temperatures in the operating range. Due to calibration and instrumentation errors, the safety analysis used a trip set point of 620°F.

Reactor Building Pressure

The high reactor building pressure trip setting limit (4 psig) provides positive assurance that a reactor trip will occur in the unlikely event of a loss-of-coolant accident, even in the absence of a low reactor coolant system pressure trip.

OCT 3 1978

Shutdown Bypass

In order to provide for control rod drive tests, zero power physics testing, and startup procedures, there is provision for bypassing certain segments of the reactor protection system. The reactor protection system segments which can be bypassed are shown in Table 2.3-1A.
2.3-1B
2.3-1C
Two conditions are imposed when the bypass is used:

1. By administrative control the nuclear overpower trip set point must be reduced to a value ≤ 5.0% of rated power during reactor shutdown.

2. A high reactor coolant system pressure trip setpoint of 1720 psig is automatically imposed.

The purpose of the 1720 psig high pressure trip set point is to prevent normal operation with part of the reactor protection system bypassed. This high pressure trip set point is lower than the normal low pressure trip set point so that the reactor must be tripped before the bypass is initiated. The over power trip set point of ≤ 5.0% prevents any significant reactor power from being produced when performing the physics tests. Sufficient natural circulation (5) would be available to remove 5.0% of rated power if none of the reactor coolant pumps were operating.

Two Pump Operation

A. Two Loop Operation

Operation with one pump in each loop will be allowed only following reactor shutdown. After shutdown has occurred, the following actions will permit operation with one pump in each loop:

1. Reset the pump contact monitor power level trip setpoint to 55.0%.
2. (Unit 1) Reset the protective system maximum allowable setpoint as shown in Figure 2.3-2A2.

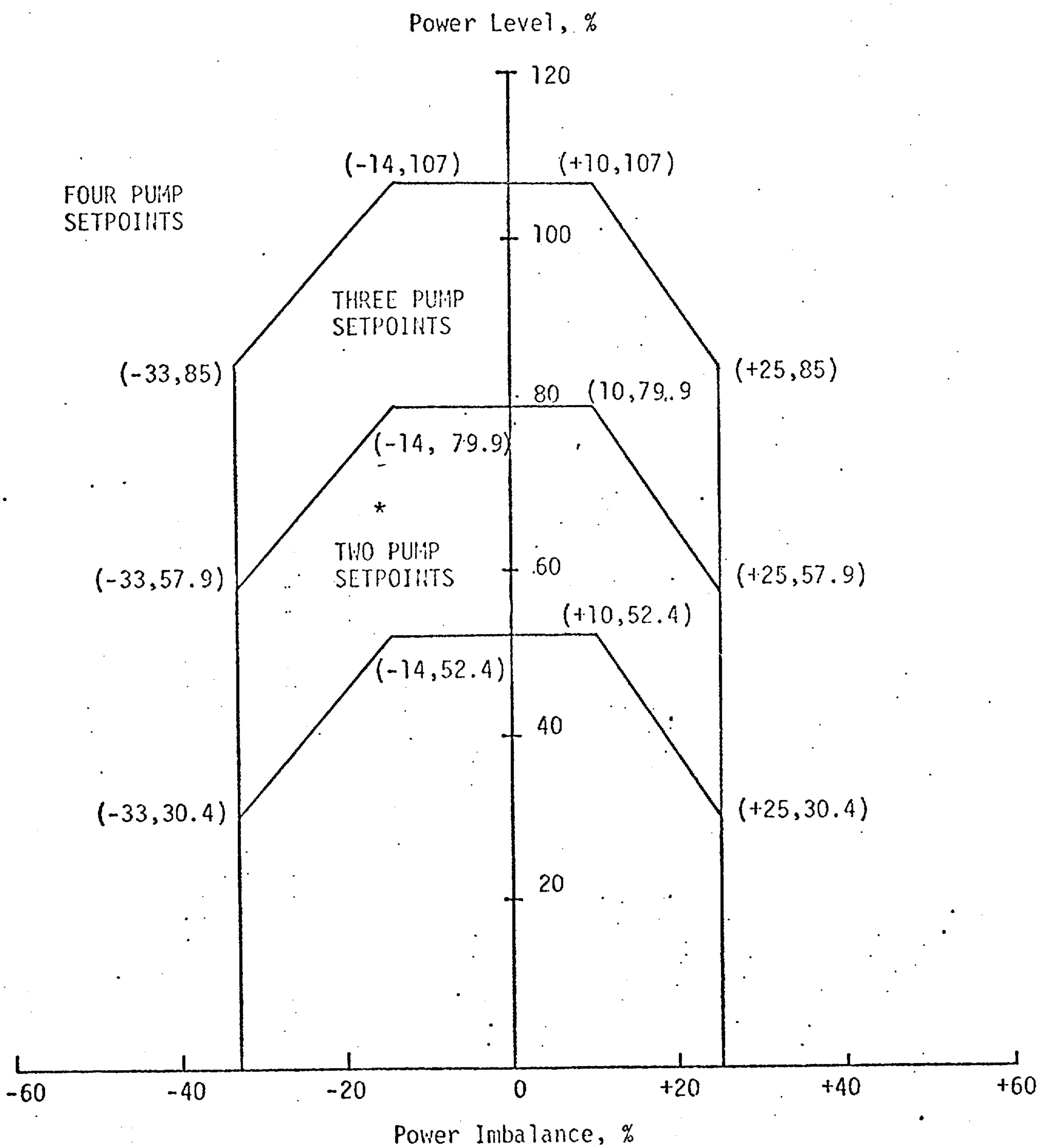
B. Single Loop Operation

Single loop operation is permitted only after the reactor has been tripped. After the pump contact monitor trip has occurred, the following actions will permit single loop operation:

1. Reset the pump contact monitor power level trip setpoint to 55.0%.
2. Trip one of the two protective channels receiving outlet temperature information from sensors in the Idle Loop.
3. (Unit 1) Reset the protective system maximum allowable setpoints as shown in Figure 2.3-2A2. Tripping one of the two protective channels receiving outlet temperature information from the idle loop assures a protective system trip logic of one out of two. 23
4. (Units 2 and 3) Reset flux-flow setpoint to 0.961. 18 10

REFERENCES

(1) FSAR, Section 14.1.2.2
(2) FSAR, Section 14.1.2.7
(3) FSAR, Section 14.1.2.8
(4) FSAR, Section 14.1.2.3
(5) FSAR, Section 14.1.2.6



*For two pumps in one loop, the flux-flow setpoint must be 0.961.

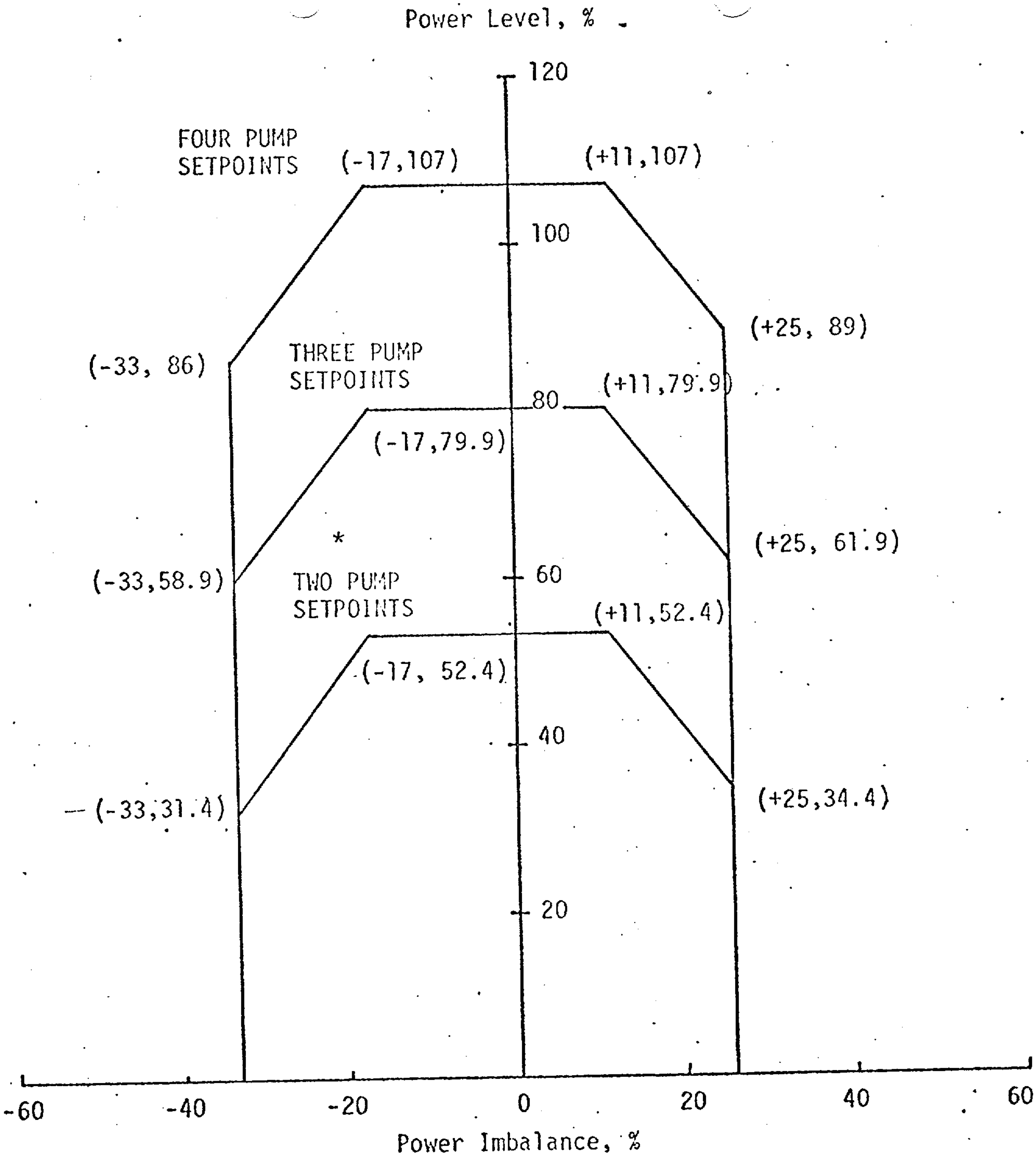
PROTECTIVE SYSTEM MAXIMUM ALLOWABLE SETPOINTS

UNIT 2

OCONEE NUCLEAR STATION

Figure 2.3-2B

OCT 31 1975



*For two pumps in one loop, the flux-flow setpoint must be 0.961

PROTECTIVE SYSTEM MAXIMUM ALLOWABLE SETPOINTS
UNIT 3
OCONEE NUCLEAR STATION
Figure 2.3-2C

OCT 31 1975

Table 2.3-1B
Unit 2

Reactor Protective System Trip Setting Limits

RPS Segment	Four Reactor Coolant Pumps Operating (Operating Power -100% Rated)	Three Reactor Coolant Pumps Operating (Operating Power -75% Rated)	Two Reactor Coolant Pumps Operating in A Single Loop (Operating Power -46% Rated)	One Reactor Coolant Pump Operating in Each Loop (Operating Power -49% Rated)	Shutdown Bypass
1. Nuclear Power Max. (% Rated)	105.5	105.5	105.5	105.5	5.0(3)
2. Nuclear Power Max. Based on Flow (2) and Imbalance, (% Rated)	1.07 times flow minus reduction due to imbalance	1.07 times flow minus reduction due to imbalance	0.961 times flow minus reduction due to imbalance	1.07 times flow minus reduction due to imbalance	Bypassed
3. Nuclear Power Max. Based on Pump Monitors, (%, Rated)	NA	NA	55% (5)(6)	55%	Bypassed
4. High Reactor Coolant System Pressure, psig, Max.	2355	2355	2355	2355	1720(4)
5. Low Reactor Coolant System Pressure, psig, Min.	1800	1800	1800	1800	Bypassed
6. Variable Low Reactor Coolant System Pressure psig, Min.	$(16.25\ T_{out}-7756)$(1)	$(16.25\ T_{out}-7756)$(1)	$(16.25\ T_{out}-7756)$(1)	$(16.25\ T_{out}-7756)$(1)	Bypassed
7. Reactor Coolant Temp. F., Max.	619	619	619 (6)	619	619
8. High Reactor Building Pressure, psig, Max.	4	4	4	4	4

(1) T_{out} is in degrees Fahrenheit (°F).

(2) Reactor Coolant System Flow, %.

(3) Administratively controlled reduction set only during reactor shutdown.

(4) Automatically set when other segments of the RPS are bypassed.

(5) Reactor power level trip set point produced by pump contact monitor reset to 55.0%.

(6) Specification 3.1.8 applies. Trip one of the two protection channels receiving outlet temperature information from sensors in the idle loop.

OCT 31 1975

Table 2.3-1C

Unit 3

Reactor Protective System Trip Setting Limits

	RPS Segment	Four Reactor Coolant Pumps Operating (Operating Power -100% Rated)	Three Reactor Coolant Pumps Operating (Operating Power -75% Rated)	Two Reactor Coolant Pumps Operating in A Single Loop (Operating Power -46% Rated)	One Reactor Coolant Pump Operating in Each Loop (Operating Power -49% Rated)	Shutdown Bypass
1.	Nuclear Power Max. (% Rated)	105.5	105.5	105.5	105.5	$5.0^{(3)}$
2.	Nuclear Power Max. Based on Flow (2) and Imbalance, (% Rated)	1.07 times flow minus reduction due to imbalance	1.07 times flow minus reduction due to imbalance	0.961 times flow minus reduction due to imbalance	1.07 times flow minus reduction due to imbalance	Bypassed
3.	Nuclear Power Max. Based on Pump Monitors, (%, Rated)	NA	NA	55% (5)(6)	55%	Bypassed
4.	High Reactor Coolant System Pressure, psig, Max.	2355	2355	2355	2355	$1720^{(4)}$
5.	Low Reactor Coolant System Pressure, psig, Min.	1800	1800	1800	1800	Bypassed
6.	Variable Low Reactor Coolant System Pressure psig, Min.	$(16.25\ T_{out}-7756)^{(1)}$	$(16.25\ T_{out}-7756)^{(1)}$	$(16.25\ T_{out}-7756)^{(1)}$	$(16.25\ T_{out}-7756)^{(1)}$	Bypassed
7.	Reactor Coolant Temp. F., Max.	619	619	619 (6)	619	619
8.	High Reactor Building Pressure, psig, Max.	4	4	4	4	4

(1) T_{out} is in degrees Fahrenheit (^{o}F).

(2) Reactor Coolant System Flow, %.

(3) Administratively controlled reduction set only during reactor shutdown.

(4) Automatically set when other segments of the RPS are bypassed.

(5) Reactor power level trip set point produced by pump contact monitor reset to 55.0%.

(6) Specification 3.1.8 applies. Trip one of the two protection channels receiving outlet temperature information from sensors in the idle loop.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 13 TO FACILITY LICENSE NO. DPR-38
CHANGE NO. 23 TO TECHNICAL SPECIFICATIONS;

AMENDMENT NO. 13 TO FACILITY LICENSE NO. DPR-47
CHANGE NO. 18 TO TECHNICAL SPECIFICATIONS;

AMENDMENT NO. 13 TO FACILITY LICENSE NO. DPR-55
CHANGE NO. 10 TO TECHNICAL SPECIFICATIONS

DUKE POWER COMPANY

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

DOCKET NOS. 50-269, 50-270, AND 50-287

Introduction

By letter dated August 26, 1975, Duke Power Company (the licensee) requested a change in the Technical Specifications of Licenses No. DPR-38, DPR-47, and DPR-55 for the Oconee Nuclear Station, Units 1, 2, and 3. The proposed amendments would (1) modify the axial power imbalance limits for the Core Protection Safety Limits and the Reactor Protective System (RPS) Maximum Allowable Setpoints, (2) reduce the flux/flow ratio from 1.07 to 0.961 for single-loop operation, and (3) change the identification of the maximum thermal power for three-pump operation from 86.0% to 86.4%.

Discussion

The present Technical Specifications contain axial power imbalance limitations for Oconee Units 2 and 3 which were derived on the basis of allowed power distributions during the entire first cycle and include considerations of the characteristically high peaking factor at Beginning of Life (BOL). As the depletion of the fuel occurs through the operating cycle of the units, the core peaking factor decreases and the original limitations become increasingly more conservative. In particular, the high peaking factor at BOL may no longer be the limiting factor after about 100 Effective Full Power Days (EFPD) of operation. Once this situation is reached, the original axial power imbalance limitations may be overly restrictive and would therefore preclude the optimum utilization of the fuel. The licensee is, therefore, requesting a change to the Technical Specifications which would take into account the decrease in the BOL peaking factor and would provide greater flexibility in reactor operation by relaxing certain specific axial power imbalance setpoints.

The above proposed changes in axial power imbalance setpoints would require that the flux/flow ratio allowed for single-loop operation be reduced from that presently permitted for other pump combinations. The licensee has, therefore, proposed a reduction in the flux/flow ratio for single-loop operation from 1.07 to 0.961.

The licensee is additionally requesting a change to the Technical Specifications which would redefine the maximum thermal power for three-pump operation from 86.0 to 86.4% by applying error adjustments which are more consistent with other Babcock and Wilcox units.

Evaluation

The licensee's proposed amendments which would relax the axial power imbalance setpoints for the Core Protection Safety Limit and the RPS setpoints is based on the fact that after about 100 EFPD of operation, the power peaking factor which exists near BOL becomes an overly restrictive criterion for establishing the axial power imbalance limitations. We agree in that with the fuel depletion experienced through the initial 100 EFPD of operation a corresponding decrease in the maximum linear heat generation rate would be realized. This decrease in the heat generation rate would result in an increase in the core safety margin over the value existing at BOL. By relaxing axial power imbalance limitations, as is proposed, an increase in peaking factor would result with a consequent increase in linear heat generation rate. It has been determined, however, that the reduction in peaking factor realized after about 100 EFPD of operation more than compensates for the increase in peaking factor which would result from the proposed revised power imbalance limits. The original safety margins are therefore maintained. At the present time, Oconee Units 2 and 3 have operated through approximately 300 and 230 EFPD, respectively. We, therefore, find the proposed changes to the axial power imbalance limits to be acceptable.

The licensee is also proposing a reduction in the flux/flow ratio for single-loop operation in order to provide adequate margin from the revised imbalance safety limits discussed above. The flux/flow ratio determines the RPS trip setpoint limits and is derived from a combination of reactor coolant system flow in percent and the existing axial power imbalance. The proposed reduction from 1.07 to 0.961 would result in a more restrictive trip setpoint for the single-loop mode of operation and has been determined to adequately compensate for the revised power imbalance limitations discussed above.

In summary, the above requested changes would allow the licensee to take credit for fuel depletion in Oconee Units 2 and 3 which more than compensates for the proposed relaxation of the axial power imbalance limitations. The resultant effect of this action does not involve any reduction in core safety margins nor decrease in any RPS trip setpoint. Accordingly, we find the proposed changes to be acceptable.

The proposed change in the maximum thermal power for the three-pump operation from 86.0 to 86.4% results from the application of revised error adjustment factors such as are utilized on other Babcock and Wilcox (B&W) units. The error adjustment factors referred to are the maximum calibration and instrument errors used to determine the maximum thermal power for the various modes of coolant pump operation. The error adjustment factors are added to the RPS trip setpoint (80% for three-pump operation) to arrive at the maximum thermal power value. The revised value of 86.4% for Oconee Units 2 and 3 is consistent with other B&W units with identical cores and which have been evaluated subsequent to the initial evaluation performed for the Oconee Units. The more recent analysis has shown that the DNBR ratio of 1.3 is maintained for values of thermal power greater than 86.4%. The proposed revision, therefore, does not involve any reduction in core safety margins and does not affect the RPS flux/flow trip setpoint for three-pump operation of 80%. Based on the above, we have concluded that the proposed change is acceptable.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the change does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the change does not involve a significant hazards consideration. (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Date: OCT 3 1 1975

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NOS. 50-260, 50-270, AND 50-287

DUKE POWER COMPANY

NOTICE OF ISSUANCE OF AMENDMENTS TO FACILITY OPERATING LICENSES

Notice is hereby given that the U.S. Nuclear Regulatory Commission (the Commission) has issued Amendments No. 13, 13, and 10 to Facility Operating Licenses No. DPR-38, DPR-47, and DPR-55, respectively, issued to Duke Power Company which revised Technical Specifications for operation of the Oconee Nuclear Station, Units 1, 2, and 3, located in Oconee County, South Carolina. The amendments are effective as of the date of issuance.

These amendments (1) modify the axial power imbalance limits for the Core Protection Safety Limits and the Reactor Protection System Maximum Allowable Setpoints, (2) reduce the flux/flow ratio from 1.07 to 0.961 for single-loop operation, and (3) change the maximum thermal power for three-loop operation from 86.0% to 86.4%.

The application for the amendments complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and The Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendments. Prior public notice of these amendments is not required since the amendments do not involve a significant hazards consideration.

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For further details with respect to this action, see (1) the application for amendments dated August 26, 1975, (2) Amendments No. 13, 13, and 10 to Licenses No. DPR-38, DPR-47, and DPR-55, with Changes No. 23, 18, and 10, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, NW., Washington, D.C. and at the Oconee County Library, 201 South Spring Street, Walhalla, South Carolina 29691.

A copy of items (2) and (3) may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Reactor Licensing.

Dated at Bethesda, Maryland, this OCT 31 1975

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by
R. A. Purple

Robert A. Purple, Chief
Operating Reactors Branch #1
Division of Reactor Licensing

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