



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

Docket File
T5 C3
50-454

April 16, 1997

Ms. Irene Johnson, Acting Manager
Nuclear Regulatory Services
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: ISSUANCE OF AMENDMENTS (TAC NOS. M94397, M94398, M94399 AND M94400)

Dear Ms. Johnson:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 88 to Facility Operating License No. NPF-37 and Amendment No. 88 to Facility Operating License No. NPF-66 for the Byron Station, Unit Nos. 1 and 2, respectively, and Amendment No. 80 to Facility Operating License No. NPF-72 and Amendment No. 80 to Facility Operating License No. NPF-77 for the Braidwood Station, Unit Nos. 1 and 2, respectively. The amendments are in response to your application dated December 21, 1995, as supplemented on October 24, 1996, and March 24, 1997.

The amendments relocate certain cycle-specific parameter limits from the Technical Specifications (TS) to the Operating Limits Report. The cycle-specific parameter limits to be relocated are for Shutdown Rod Insertion Limit, Control Rod Insertion Limits, Axial Flux Difference Target Band, Heat Flux Hot Channel Factor [$F_{\phi}(z)$], and Nuclear Enthalpy Rise Hot Channel Factor ($F_{\Delta H}^N$). In addition, your March 24, 1997, submittal contained supplementary revisions to the Bases section associated with the above TS change. The supplementary Bases pages will be reviewed and transmitted to you under separate cover. Finally, Braidwood's TS 6.9.1.7 title was corrected.

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Ms. Irene Johnson

- 2 -

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original signed by:

George F. Dick, Senior Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-454, STN 50-455,
STN 50-456, STN 50-457

Enclosures: 1. Amendment No. 88 to NPF-37
2. Amendment No. 88 to NPF-66
3. Amendment No. 80 to NPF-72
4. Amendment No. 80 to NPF-77
5. Safety Evaluation

cc w/encl: see next page

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DATE	03/15/97	04/15/97	04/16/97	04/16/97	04/16/97	04/16/97

04/16/97

I. Johnson
Commonwealth Edison Company

cc:

Mr. William P. Poirier, Director
Westinghouse Electric Corporation
Energy Systems Business Unit
Post Office Box 355, Bay 236 West
Pittsburgh, Pennsylvania 15230

Joseph Gallo
Gallo & Ross
1250 Eye St., N.W.
Suite 302
Washington, DC 20005

Michael I. Miller, Esquire
Sidley and Austin
One First National Plaza
Chicago, Illinois 60603

Howard A. Learner
Environmental law and Policy
Center of the Midwest
203 North LaSalle Street
Suite 1390
Chicago, Illinois 60601

U.S. Nuclear Regulatory Commission
Byron Resident Inspectors Office
4448 North German Church Road
Byron, Illinois 61010-9750

Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, Illinois 60532-4351

Ms. Lorraine Creek
Rt. 1, Box 182
Manteno, Illinois 60950

Chairman, Ogle County Board
Post Office Box 357
Oregon, Illinois 61061

Mrs. Phillip B. Johnson
1907 Stratford Lane
Rockford, Illinois 61107

Byron/Braidwood Power Stations

George L. Edgar
Morgan, Lewis and Bochius
1800 M Street, N.W.
Washington, DC 20036

Attorney General
500 South Second Street
Springfield, Illinois 62701

EIS Review Coordinator
U.S. Environmental Protection Agency
77 W. Jackson Blvd.
Chicago, Illinois 60604-3590

Illinois Department of
Nuclear Safety
Office of Nuclear Facility Safety
1035 Outer Park Drive
Springfield, Illinois 62704

Commonwealth Edison Company
Byron Station Manager
4450 North German Church Road
Byron, Illinois 61010

Kenneth Graesser, Site Vice President
Byron Station
Commonwealth Edison Station
4450 N. German Church Road
Byron, Illinois 61010

U.S. Nuclear Regulatory Commission
Braidwood Resident Inspectors Office
Rural Route #1, Box 79
Braceville, Illinois 60407

Mr. Ron Stephens
Illinois Emergency Services
and Disaster Agency
110 East Adams Street
Springfield, Illinois 62706

Chairman
Will County Board of Supervisors
Will County Board Courthouse
Joliet, Illinois 60434

Commonwealth Edison Company
Braidwood Station Manager
Rt. 1, Box 84
Braceville, Illinois 60407

Ms. Bridget Little Rorem
Appleseed Coordinator
117 North Linden Street
Essex, Illinois 60935

Document Control Desk-Licensing
Commonwealth Edison Company
1400 Opus Place, Suite 400
Downers Grove, Illinois 60515

Mr. H. G. Stanley
Site Vice President
Braidwood Station
Commonwealth Edison Company
RR 1, Box 84
Braceville, IL 60407



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

COMMONWEALTH EDISON COMPANY

DOCKET NO. STN 50-454

BYRON STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 88
License No. NPF-37

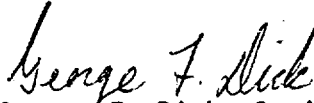
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Commonwealth Edison Company (the licensee) dated December 21, 1995, as supplemented on October 24, 1996, and March 24, 1997, complies with the standards and requirements of the Atomic Energy Act 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-37 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 88 and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



George F. Dick, Senior Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 16, 1997



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

COMMONWEALTH EDISON COMPANY

DOCKET NO. STN 50-455

BYRON STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 88
License No. NPF-66

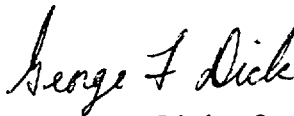
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Commonwealth Edison Company (the licensee) dated December 21, 1995, as supplemented on October 24, 1996, and March 24, 1997, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter 1;
 - 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-66 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A (NUREG-1113), as revised through Amendment No. 88 and revised by Attachment 2 to NPF-66, and the Environmental Protection Plan contained in Appendix B, both of which were attached to License No. NPF-37, dated February 14, 1985, are hereby incorporated into this license. Attachment 2 contains a revision to Appendix A which is hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



George F. Dick, Senior Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 16, 1997

ATTACHMENT TO LICENSE AMENDMENT NOS. 88 AND 88
FACILITY OPERATING LICENSE NOS. NPF-37 AND NPF-66
DOCKET NOS. STN 50-454 AND STN 50-455

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the attached pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change.

Remove Pages

IV
V
1-4
3/4 1-14
3/4 1-15
3/4 1-20
3/4 1-21
3/4 1-22
3/4 2-1
3/4 2-2
3/4 2-3
3/4 2-4
3/4 2-5
3/4 2-8
B 3/4 2-2
6-22
6-22a

Insert Pages

IV
V
1-4
3/4 1-14
3/4 1-15
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3/4 1-21
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3/4 2-2
3/4 2-3
3/4 2-4
3/4 2-5
3/4 2-8
B 3/4 2-2
6-22
6-22a
6-22b

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

<u>SECTION</u>	<u>PAGE</u>
<u>3/4.0 APPLICABILITY</u>	3/4 0-1
<u>3/4.1 REACTIVITY CONTROL SYSTEMS</u>	
3/4.1.1 BORATION CONTROL	
Shutdown Margin - $T_{avg} > 200^{\circ}\text{F}$	3/4 1-1
Shutdown Margin - $T_{avg} \leq 200^{\circ}\text{F}$	3/4 1-3
Moderator Temperature Coefficient.....	3/4 1-4
FIGURE 3.1-0 MODERATOR TEMPERATURE COEFFICIENT VERSUS POWER LEVEL.....	3/4 1-5a
Minimum Temperature for Criticality.....	3/4 1-6
3/4.1.2 BORATION SYSTEMS	
Flow Path - Shutdown.....	3/4 1-7
Flow Paths - Operating.....	3/4 1-8
Charging Pump - Shutdown.....	3/4 1-9
Charging Pumps - Operating.....	3/4 1-10
Borated Water Source - Shutdown.....	3/4 1-11
Borated Water Sources - Operating.....	3/4 1-12
Boron Dilution Protection System.....	3/4 1-13a
3/4.1.3 MOVABLE CONTROL ASSEMBLIES	
Group Height.....	3/4 1-14
TABLE 3.1-1 ACCIDENT ANALYSES REQUIRING REEVALUATION IN THE EVENT OF AN INOPERABLE FULL-LENGTH ROD.....	3/4 1-16
Position Indication Systems - Operating.....	3/4 1-17
Position Indication System - Shutdown.....	3/4 1-18
Rod Drop Time.....	3/4 1-19
Shutdown Rod Insertion Limit.....	3/4 1-20
Control Rod Insertion Limits.....	3/4 1-21
FIGURE 3.1-1 (THIS FIGURE IS NOT USED).....	3/4 1-22

SECTION

PAGE

3/4.2 POWER DISTRIBUTION LIMITS

3/4.2.1	AXIAL FLUX DIFFERENCE.....	3/4 2-1
	FIGURE 3.2-1 (THIS FIGURE IS NOT USED).....	3/4 2-3
3/4.2.2	HEAT FLUX HOT CHANNEL FACTOR.....	3/4 2-4
	FIGURE 3.2-2 (THIS FIGURE IS NOT USED).....	3/4 2-5
3/4.2.3	RCS FLOW RATE AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR.....	3/4 2-8
3/4.2.4	QUADRANT POWER TILT RATIO.....	3/4 2-10
3/4.2.5	DNB PARAMETERS.....	3/4 2-13
	TABLE 3.2-1 DNB PARAMETERS.....	3/4 2-14

3/4.3 INSTRUMENTATION

3/4.3.1	REACTOR TRIP SYSTEM INSTRUMENTATION.....	3/4 3-1
	TABLE 3.3-1 REACTOR TRIP SYSTEM INSTRUMENTATION.....	3/4 3-2
	TABLE 3.3-2 (THIS TABLE IS NOT USED).....	3/4 3-7
	TABLE 4.3-1 REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS.....	3/4 3-9
3/4.3.2	ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION.....	3/4 3-13
	TABLE 3.3-3 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION.....	3/4 3-15
	TABLE 3.3-4 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS.....	3/4 3-23
	TABLE 3.3-5 (THIS TABLE IS NOT USED).....	3/4 3-30
	TABLE 4.3-2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS.....	3/4 3-34

DEFINITIONS

OFFSITE DOSE CALCULATION MANUAL

1.18 The OFFSITE DOSE CALCULATION MANUAL (ODCM) shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring Alarm/Trip Setpoints, and in the conduct of the Environmental Radiological Monitoring Program. The ODCM shall also contain (1) the Radioactive Effluent Controls and Radiological Environmental Monitoring Programs required by Sections 6.8.4e and f, and (2) descriptions of the information that should be included in the Annual Radiological Environmental Operating and Radioactive Effluent Release Reports required by Specifications 6.9.1.6 and 6.9.1.7.

OPERABLE - OPERABILITY

1.19 A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s), and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its function(s) are also capable of performing their related support function(s).

OPERATING LIMITS REPORT

1.19.a The OPERATING LIMITS REPORT (OLR) is the unit-specific document that provides operating limits for the current operating reload cycle. These cycle-specific operating limits shall be determined for each reload cycle in accordance with Specification 6.9.1.9. Plant operation within these operating limits is addressed in individual specifications.

OPERATIONAL MODE - MODE

1.20 An OPERATIONAL MODE (i.e., MODE) shall correspond to any one inclusive combination of core reactivity condition, power level, and average reactor coolant temperature specified in Table 1.2.

P_a

1.20.a P_a shall be the maximum calculated primary containment pressure (44.4 psig) for the design basis loss of coolant accident.

PHYSICS TESTS

1.21 PHYSICS TESTS shall be those tests performed to measure the fundamental nuclear characteristics of the core and related instrumentation: (1) described in Chapter 14.0 of the FSAR, (2) authorized under the provisions of 10 CFR 50.59, or (3) otherwise approved by the Commission.

PRESSURE BOUNDARY LEAKAGE

1.22 PRESSURE BOUNDARY LEAKAGE shall be leakage (except steam generator tube leakage) through a nonisolable fault in a Reactor Coolant System component body, pipe wall, or vessel wall.

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

3.1.3.1 All full-length shutdown and control rods shall be OPERABLE and positioned within ± 12 steps (indicated position) of their group step counter demand position.

APPLICABILITY: MODES 1* and 2*.

ACTION:

- a. With one or more full-length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.
- b. With one full-length rod trippable but inoperable due to causes other than addressed by ACTION a. above, or misaligned from its group step counter demand height by more than ± 12 steps (indicated position), POWER OPERATION may continue provided that within 1 hour:
 1. The rod is restored to OPERABLE status within the above alignment requirements, or
 2. The rod is declared inoperable and the remainder of the rods in the group with the inoperable rod are aligned to within ± 12 steps of the inoperable rod while maintaining the rod sequence and insertion limits of Specification 3.1.3.6. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, or
 3. The rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:
 - a) The THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within the next hour and within the following 4 hours the High Neutron Flux Trip Setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER.
 - b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours;

*See Special Test Exceptions Specifications 3.10.2 and 3.10.3.

REACTIVITY CONTROL SYSTEMS

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

- c) A power distribution map is obtained from the movable incore detectors and $F_q(Z)$ and F_{AH}^N are verified to be within their limits within 72 hours; and
 - d) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions;
- c. With more than one full-length rod trippable but inoperable due to causes other than addressed by ACTION a. above, or misaligned from its group step counter demand height by more than ± 12 steps (indicated position), POWER OPERATION may continue provided that:
- 1. Within 1 hour, the remainder of the rods in the group(s) with the inoperable rods are aligned to within ± 12 steps of the inoperable rods while maintaining the rod sequence and insertion limits of Specification 3.1.3.6. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, and
 - 2. The inoperable rods shall be restored to OPERABLE status within 72 hours.

Otherwise, be in HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full-length rod shall be determined to be within the group demand limit by verifying the individual rod positions at least once per 12 hours except during time intervals when the rod position deviation monitor is inoperable, then verify the group positions at least once per 4 hours.

4.1.3.1.2 Each full-length rod not fully inserted in the core shall be determined OPERABLE by movement of at least 10 steps in any one direction at least once per 92 days.

REACTIVITY CONTROL SYSTEMS

SHUTDOWN ROD INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

3.1.3.5 All shutdown rods shall be limited in physical insertion as specified in the OPERATING LIMITS REPORT.

APPLICABILITY: MODES 1* and 2*#.

ACTION:

With a maximum of one shutdown rod inserted beyond the insertion limit, except for surveillance testing pursuant to Specification 4.1.3.1.2, within 1 hour either:

- a. Restore the rod to within the insertion limit specified in the OPERATING LIMITS REPORT, or
- b. Declare the rod to be inoperable and apply Specification 3.1.3.1.

SURVEILLANCE REQUIREMENTS

4.1.3.5 Each shutdown rod shall be determined to be within the insertion limit:

- a. Within 15 minutes prior to withdrawal of any rods in Control Bank A, B, C, or D during an approach to reactor criticality, and
- b. At least once per 12 hours thereafter.

*See Special Test Exceptions Specifications 3.10.2 and 3.10.3.

#With K_{eff} greater than or equal to 1.

REACTIVITY CONTROL SYSTEMS

CONTROL ROD INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 The control banks shall be limited in physical insertion as specified in the OPERATING LIMITS REPORT.

APPLICABILITY: MODES 1* and 2*#.

ACTION:

With the control banks inserted beyond the insertion limits, except for surveillance testing pursuant to Specification 4.1.3.1.2:

- a. Restore the control banks to within the limits within 2 hours, or
- b. Reduce THERMAL POWER within 2 hours to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the bank position using the insertion limits specified in the OPERATING LIMITS REPORT, or
- c. Be in at least HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.6 The position of each control bank shall be determined to be within the insertion limits at least once per 12 hours except during time intervals when the Rod Insertion Limit Alarm is inoperable, then verify the individual rod positions at least once per 4 hours.

*See Special Test Exceptions Specifications 3.10.2 and 3.10.3.

#With K_{eff} greater than or equal to 1.

FIGURE 3.1-1
(THIS FIGURE IS NOT USED)

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 the target band (flux difference units) about the target flux difference. The target band is specified in the OPERATING LIMITS REPORT.

The indicated AFD may deviate outside the required target band at greater than or equal to 50% but less than 90% of RATED THERMAL POWER provided the indicated AFD is within the Acceptable Operation Limits specified in the OPERATING LIMITS REPORT and the cumulative penalty deviation time does not exceed 1 hour during the previous 24 hours.

The indicated AFD may deviate outside the required target band at greater than 15% but less than 50% of RATED THERMAL POWER provided the cumulative penalty deviation time does not exceed 1 hour during the previous 24 hours.

APPLICABILITY: MODE 1 above 15% of RATED THERMAL POWER*.

ACTION:

- a. With the indicated AFD outside of the required target band and with THERMAL POWER greater than or equal to 90% of RATED THERMAL POWER, within 15 minutes, either:
 1. Restore the indicated AFD to within the required target band limits, or
 2. Reduce THERMAL POWER to less than 90% of RATED THERMAL POWER.
- b. With the indicated AFD outside of the required target band for more than 1 hour of cumulative penalty deviation time during the previous 24 hours or outside the Acceptable Operation Limits specified in the OPERATING LIMITS REPORT and with THERMAL POWER less than 90% but equal to or greater than 50% of RATED THERMAL POWER, reduce:
 1. THERMAL POWER to less than 50% of RATED THERMAL POWER within 30 minutes, and
 2. The Power Range Neutron Flux - High* Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours.

*See Special Test Exceptions Specification 3.10.2.

#Surveillance testing of the Power Range Neutron Flux channel may be performed pursuant to Specification 4.3.1.1 provided the indicated AFD is maintained within the Acceptable Operation Limits specified in the OPERATING LIMITS REPORT. A total of 16 hours operation may be accumulated with the AFD outside of the required target band during testing without penalty deviation.

ACTION (Continued)

- c. With the indicated AFD outside of the required target band for more than 1 hour of cumulative penalty deviation time during the previous 24 hours and with THERMAL POWER less than 50% but greater than 15% of RATED THERMAL POWER, the THERMAL POWER shall not be increased equal to or greater than 50% of RATED THERMAL POWER until the indicated AFD is within the required target band.

SURVEILLANCE REQUIREMENTS

4.2.1.1 The indicated AFD 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 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 target band when two or more OPERABLE excore channels are indicating the AFD to be outside the target band. Penalty deviation outside of the required target band shall be accumulated on a time basis of:

- a. One minute penalty deviation for each 1 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 1 minute of POWER OPERATION outside of the target band at THERMAL POWER levels between 15% and 50% of RATED THERMAL POWER.

4.2.1.3 The initial determination of target flux difference following a re-fueling outage shall be based on design predictions. Otherwise, the target flux difference of each OPERABLE excore channel shall be determined by measurement at least once per 92 Effective Full Power Days.

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 Specification 4.2.1.3 above or by linear interpolation between the most recently measured value and the predicted value at the end of the cycle life.

Figure 3.2-1

(THIS FIGURE IS NOT USED)

POWER DISTRIBUTION LIMITS

3/4.2.2 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:

$$F_q(Z) \leq \left[\frac{F_q^{RTP}}{P} \right] [K(Z)] \text{ for } P > 0.5, \text{ and}$$

$$F_q(Z) \leq \left[\frac{F_q^{RTP}}{0.5} \right] [K(Z)] \text{ for } P \leq 0.5.$$

Where:

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

$$F_q^{RTP} = \text{the } F_q \text{ limit(s) at RATED THERMAL POWER (RTP) specified in the OPERATING LIMITS REPORT, and}$$

$K(Z)$ is the function specified in the OPERATING LIMITS REPORT for a given core height location.

APPLICABILITY: MODE 1.

ACTION:

With $F_q(Z)$ exceeding its limit:

- a. 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; and
- b. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER above the reduced limit required by ACTION a., above; THERMAL POWER may then be increased provided $F_q(Z)$ is demonstrated through incore mapping to be within its limit.

FIGURE 3.2-2

(THIS FIGURE IS NOT USED)

POWER DISTRIBUTION LIMITS

3/4.2.3 RCS FLOW RATE AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

LIMITING CONDITION FOR OPERATION

3.2.3 Indicated Reactor Coolant System (RCS) total flow rate and $F_{\Delta H}^N$ shall be maintained as follows for four loop operation:

- a. 1)* RCS Total Flowrate $\geq 371,400$ gpm,
2)** RCS Total Flowrate $\geq 390,400$ gpm, and
- b. $F_{\Delta H}^N \leq F_{\Delta H}^{RTP} [1.0 + PF_{\Delta H} (1.0 - P)]$

where:

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

$F_{\Delta H}^{RTP} =$ the $F_{\Delta H}^N$ limit(s) at RATED THERMAL POWER (RTP) specified in the OPERATING LIMITS REPORT, and

$PF_{\Delta H} =$ the Power Factor Multiplier(s) for $F_{\Delta H}^N$ specified in the OPERATING LIMITS REPORT.

Measured values of $F_{\Delta H}^N$ are obtained by using the movable incore detectors. An appropriate uncertainty of 4% (nominal) or greater shall then be applied to the measured value of $F_{\Delta H}^N$ before it is compared to the requirements.

APPLICABILITY: MODE 1.

ACTION:

With RCS total flow rate or $F_{\Delta H}^N$ outside the region of acceptable operation:

- a. Within 2 hours either:
 1. Restore RCS total flow rate and $F_{\Delta H}^N$ 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 less than or equal to 55% of RATED THERMAL POWER within the next 4 hours.

*Applicable to Unit 1. Applicable to Unit 2 after cycle 5.

**Not applicable to Unit 1. Applicable to Unit 2 until the completion of cycle 5.

POWER DISTRIBUTION LIMITS

BASES

AXIAL FLUX DIFFERENCE (Continued)

Although it is intended that the plant will be operated with the AFD within the target band required by Specification 3.2.1 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 specified in the OPERATING LIMITS REPORT while at THERMAL POWER levels between 50% and 90% of RATED THERMAL POWER. For THERMAL POWER levels between 15% and 50% of RATED THERMAL POWER, deviations of 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 1-minute average of each of the OPERABLE excore detector outputs and provides an alarm message immediately if the AFD for two or more OPERABLE excore channels are outside the target band and the THERMAL POWER is greater than 90% of RATED THERMAL POWER. During operation at THERMAL POWER levels between 50% and 90% 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.

Figure B 3/4 2-1 shows a typical monthly target band.

3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR, and RCS FLOWRATE AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

The limits on heat flux hot channel factor, RCS flowrate, 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.

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 insure that the limits are maintained provided:

- a. Control rods in a single group move together with no individual rod position differing by more than ± 12 steps, indicated, from the group demand position,
- b. Control rod groups are sequenced with overlapping groups as described in Specification 3.1.3.6,

ADMINISTRATIVE CONTROL

REPORTING REQUIREMENTS (Continued)

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT*

6.9.1.6 The Annual Radiological Environmental Operating Report covering the operation of the facility during the previous calendar year shall be submitted prior to May 1 of each year. The report shall include summaries, interpretations, and analysis of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives outlined in (1) the ODCM and (2) Sections IV.B.2, IV.B.3, and IV.C of Appendix I to 10 CFR Part 50.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT**

6.9.1.7 A Radioactive Effluent Release Report covering the operation of the facility during the previous year shall be submitted prior to May 1 of each year. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the facility. The material provided shall be (1) consistent with the objectives outlined in the ODCM and PCP and (2) in conformance with 10 CFR 50.36a and Section IV.B.1 of Appendix I to 10 CFR Part 50.

MONTHLY OPERATING REPORT

6.9.1.8 Routine reports of operating statistics and shutdown experience, including documentation of all challenges to the 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 Regional Administrator of the NRC Regional Office, no later than the 15th of each month following the calendar month covered by the report.

OPERATING LIMITS REPORT

6.9.1.9 Operating limits shall be established and documented in the OPERATING LIMITS REPORT (OLR) before each reload cycle or any remaining part of a reload cycle for the following:

1. Moderator Temperature Coefficient for Specification 3.1.1.3,
2. Shutdown Bank Insertion Limit for Specification 3.1.3.5,
3. Control Bank Insertion Limit for Specification 3.1.3.6,
4. Axial Flux Difference Limits, Target Band for Specification 3.2.1,
5. Heat Flux Hot Channel Factor and $K(Z)$ for Specification 3.2.2,
6. Nuclear Enthalpy Rise Hot Channel Factor, and Power Factor Multiplier for Specification 3.2.3, and
7. F_{xy} Radial Peaking Factor for Specification 4.2.2.2.

*A single submittal may be made for a multi-unit station.

**A single submittal may be made for a multi-unit station. The submittal should combine those sections that are common to all units at the station; however, for units with separate radwaste systems, the submittal shall specify the releases of radioactive material from each unit.

REPORTING REQUIREMENTS (Continued)OPERATING LIMITS REPORT (Continued)

The analytical methods used to determine the operating limits shall be those previously reviewed and approved by the NRC in the following documents:

1. WCAP-9272-P-A, "Westinghouse Reload Safety Evaluations Methodology," dated July 1985 (Westinghouse Proprietary). (Methodology for Specification: Shutdown Bank Insertion Limit, Control Bank Insertion Limit, Axial Flux Difference, Heat Flux Hot Channel Factor, and Nuclear Enthalpy Rise Hot Channel Factor).
2. WCAP-8385, "Power Distribution Control and Load Following Procedures-Topical Report," dated September 1974 (Westinghouse Proprietary). (Methodology for Specification: Axial Flux Difference, Constant Axial Offset Control).
3. WCAP-9220-P-A, "Westinghouse ECCS Evaluation Model-1981 Version," Revision 1, dated February 1982 (Westinghouse Proprietary). (Methodology for Specification: Heat Flux Hot Channel Factor).
4. WCAP-9561-P-A, "BART A-1: A Computer Code for the Best Estimate Analysis of Reflood Transients," including Addendum 3, "Special Report - Thimble Modeling in Westinghouse ECCS Evaluation Model," Revision 1, dated July 1986 (Westinghouse Proprietary). (Methodology for Specification: Heat Flux Hot Channel Factor).
5. WCAP-10266-P-A, "The 1981 Version of the Westinghouse ECCS Evaluation Model Using the BASH Code," Revision 2, dated March 1987, including Addendum 1 "Power Shape Sensitivity Studies," Revision 2-P-A, dated December 15, 1987, and Addendum 2 "BASH Methodology Improvements and Reliability Enhancements," Revision 2, dated May 1988 (Westinghouse Proprietary). (Methodology for Specification: Heat Flux Hot Channel Factor).
6. NFSR-0016, "Commonwealth Edison Company Topical Report on Benchmark of PWR Nuclear Design Methods," dated July 1983. (Methodology for Specification: Shutdown Bank Insertion Limit, Control Bank Insertion Limit, Axial Flux Difference, Heat Flux Hot Channel Factor, and Nuclear Enthalpy Rise Hot Channel Factor).
7. NFSR-0081, "Commonwealth Edison Company Topical Report on Benchmark of PWR Nuclear Design Methods Using the Phoenix-P and ANC Computer Codes," dated July 1990. (Methodology for Specification: Shutdown Bank Insertion Limit, Control Bank Insertion Limit, Axial Flux Difference, Heat Flux Hot Channel Factor, Nuclear Enthalpy Rise Hot Channel Factor, and Moderator Temperature Coefficient).
8. WCAP-10079-P-A, "NOTRUMP, A Nodal Transient Small Break and General Network Code," dated August 1985 (Westinghouse Proprietary). (Methodology for Specification: Heat Flux Hot Channel Factor and Nuclear Enthalpy Rise Hot Channel Factor).

ADMINISTRATIVE CONTROLS

REPORTING REQUIREMENTS (Continued)

OPERATING LIMITS REPORT (Continued)

9. WCAP-10054-P-A, "Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code," dated August 1985 (Westinghouse Proprietary).
(Methodology for Specification: Axial Flux Difference, Heat Flux Hot Channel Factor, and Nuclear Enthalpy Rise Hot Channel Factor).
10. ComEd letter from D. Saccomando to the Office of Nuclear Reactor Regulation dated December 21, 1994, transmitting an attachment that documents applicable sections of WCAP-11992/11993 and ComEd application of the UET methodology addressed in "Additional Information Regarding Application for Amendment to Facility Operating Licenses-Reactivity Controls Systems."

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

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



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

COMMONWEALTH EDISON COMPANY

DOCKET NO. STN 50-456

BRAIDWOOD STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 80
License No. NPF-72

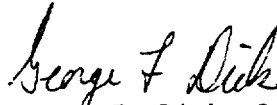
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Commonwealth Edison Company (the licensee) dated December 21, 1995, as supplemented on October 24, 1996, and March 24, 1997, complies with the standards and requirements of the Atomic Energy Act 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-72 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 80 and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



George F. Dick, Senior Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 16, 1997



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

COMMONWEALTH EDISON COMPANY

DOCKET NO. STN 50-457

BRAIDWOOD STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 80
License No. NPF-77

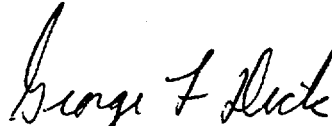
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Commonwealth Edison Company (the licensee) dated December 21, 1995, as supplemented on October 24, 1996, and March 24, 1997, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter 1;
 - 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-77 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 80 and the Environmental Protection Plan contained in Appendix B, both of which were attached to License No. NPF-72, dated July 2, 1987, are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



George F. Dick, Senior Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 16, 1997

ATTACHMENT TO LICENSE AMENDMENT NOS. 80 AND 80
FACILITY OPERATING LICENSE NOS. NPF-72 AND NPF-77
DOCKET NOS. STN 50-456 AND STN 50-457

Replace the following pages of the Appendix "A" Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the area of change.

Remove Pages

IV
V
1-4
3/4 1-14
3/4 1-15
3/4 1-20
3/4 1-21
3/4 1-22
3/4 2-1
3/4 2-2
3/4 2-3
3/4 2-4
3/4 2-5
3/4 2-8
B 3/4 2-2
6-22
6-22a

Insert Pages

IV
V
1-4
3/4 1-14
3/4 1-15
3/4 1-20
3/4 1-21
3/4 1-22
3/4 2-1
3/4 2-2
3/4 2-3
3/4 2-4
3/4 2-5
3/4 2-8
B 3/4 2-2
6-22
6-22a
6-22b

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

<u>SECTION</u>	<u>PAGE</u>
<u>3/4.0 APPLICABILITY</u>	3/4 0-1
<u>3/4.1 REACTIVITY CONTROL SYSTEMS</u>	
3/4.1.1 BORATION CONTROL	
Shutdown Margin - $T_{avg} > 200^{\circ}\text{F}$	3/4 1-1
Shutdown Margin - $T_{avg} \leq 200^{\circ}\text{F}$	3/4 1-3
Moderator Temperature Coefficient.....	3/4 1-4
FIGURE 3.1-0 MODERATOR TEMPERATURE COEFFICIENT VERSUS	
POWER LEVEL.....	3/4 1-5a
Minimum Temperature for Criticality.....	3/4 1-6
3/4.1.2 BORATION SYSTEMS	
Flow Path - Shutdown.....	3/4 1-7
Flow Paths - Operating.....	3/4 1-8
Charging Pump - Shutdown.....	3/4 1-9
Charging Pumps - Operating.....	3/4 1-10
Borated Water Source - Shutdown.....	3/4 1-11
Borated Water Sources - Operating.....	3/4 1-12
Boron Dilution Protection System.....	3/4 1-13a
3/4.1.3 MOVABLE CONTROL ASSEMBLIES	
Group Height.....	3/4 1-14
TABLE 3.1-1 ACCIDENT ANALYSES REQUIRING REEVALUATION IN THE	
EVENT OF AN INOPERABLE FULL-LENGTH ROD.....	3/4 1-16
Position Indication Systems - Operating.....	3/4 1-17
Position Indication System - Shutdown.....	3/4 1-18
Rod Drop Time.....	3/4 1-19
Shutdown Rod Insertion Limit.....	3/4 1-20
Control Rod Insertion Limits.....	3/4 1-21
FIGURE 3.1-1 (THIS FIGURE IS NOT USED).....	3/4 1-22

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

SECTION

PAGE

3/4.2 POWER DISTRIBUTION LIMITS

3/4.2.1	AXIAL FLUX DIFFERENCE.....	3/4 2-1
	FIGURE 3.2-1 (THIS FIGURE IS NOT USED).....	3/4 2-3
3/4.2.2	HEAT FLUX HOT CHANNEL FACTOR.....	3/4 2-4
	FIGURE 3.2-2 (THIS FIGURE IS NOT USED).....	3/4 2-5
3/4.2.3	RCS FLOW RATE AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR.....	3/4 2-8
3/4.2.4	QUADRANT POWER TILT RATIO.....	3/4 2-10
3/4.2.5	DNB PARAMETERS.....	3/4 2-13
	TABLE 3.2-1 DNB PARAMETERS.....	3/4 2-14

3/4.3 INSTRUMENTATION

3/4.3.1	REACTOR TRIP SYSTEM INSTRUMENTATION.....	3/4 3-1
	TABLE 3.3-1 REACTOR TRIP SYSTEM INSTRUMENTATION.....	3/4 3-2
	TABLE 3.3-2 (THIS TABLE IS NOT USED).....	3/4 3-7
	TABLE 4.3-1 REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS.....	3/4 3-9
3/4.3.2	ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION.....	3/4 3-13
	TABLE 3.3-3 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION.....	3/4 3-15
	TABLE 3.3-4 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS.....	3/4 3-23
	TABLE 3.3-5 (THIS TABLE IS NOT USED).....	3/4 3-30
	TABLE 4.3-2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS.....	3/4 3-34

DEFINITIONS

OFFSITE DOSE CALCULATION MANUAL

1.18 The OFFSITE DOSE CALCULATION MANUAL (ODCM) shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring Alarm/Trip Setpoints, and in the conduct of the Environmental Radiological Monitoring Program. The ODCM shall also contain (1) the Radioactive Effluent Controls and Radiological Environmental Monitoring Programs required by Sections 6.8.4.e and f, and (2) descriptions of the information that should be included in the Annual Radiological Environmental Operating and Radioactive Effluent Release Reports required by Specifications 6.9.1.6 and 6.9.1.7.

OPERABLE - OPERABILITY

1.19 A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s), and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its function(s) are also capable of performing their related support function(s).

OPERATING LIMITS REPORT

1.19.a The OPERATING LIMITS REPORT (OLR) is the unit-specific document that provides operating limits for the current operating reload cycle. These cycle-specific operating limits shall be determined for each reload cycle in accordance with Specification 6.9.1.9. Plant operation within these operating limits is addressed in individual specifications.

OPERATIONAL MODE - MODE

1.20 An OPERATIONAL MODE (i.e., MODE) shall correspond to any one inclusive combination of core reactivity condition, power level, and average reactor coolant temperature specified in Table 1.2.

P_a

1.20.a P_a shall be the maximum calculated primary containment pressure (44.4 psig) for the design basis loss of coolant accident.

PHYSICS TESTS

1.21 PHYSICS TESTS shall be those tests performed to measure the fundamental nuclear characteristics of the core and related instrumentation: (1) described in Chapter 14.0 of the FSAR, (2) authorized under the provisions of 10 CFR 50.59, or (3) otherwise approved by the Commission.

PRESSURE BOUNDARY LEAKAGE

1.22 PRESSURE BOUNDARY LEAKAGE shall be leakage (except steam generator tube leakage) through a nonisolable fault in a Reactor Coolant System component body, pipe wall, or vessel wall.

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

3.1.3.1 All full-length shutdown and control rods shall be OPERABLE and positioned within ± 12 steps (indicated position) of their group step counter demand position.

APPLICABILITY: MODES 1* and 2*.

ACTION:

- a. With one or more full-length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.
- b. With one full-length rod trippable but inoperable due to causes other than addressed by ACTION a. above, or misaligned from its group step counter demand height by more than ± 12 steps (indicated position), POWER OPERATION may continue provided that within 1 hour:
 1. The rod is restored to OPERABLE status within the above alignment requirements, or
 2. The rod is declared inoperable and the remainder of the rods in the group with the inoperable rod are aligned to within ± 12 steps of the inoperable rod while maintaining the rod sequence and insertion limits of Specification 3.1.3.6. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, or
 3. The rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:
 - a) The THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within the next hour and within the following 4 hours the High Neutron Flux Trip Setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER.
 - b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours;

* See Special Test Exceptions Specifications 3.10.2 and 3.10.3.

REACTIVITY CONTROL SYSTEMS

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

- c) A power distribution map is obtained from the movable incore detectors and $F_q(Z)$ and F_{AH}^N are verified to be within their limits within 72 hours; and
 - d) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions;
- c. With more than one full-length rod trippable but inoperable due to causes other than addressed by ACTION a. above, or misaligned from its group step counter demand height by more than ± 12 steps (indicated position), POWER OPERATION may continue provided that:
- 1. Within 1 hour, the remainder of the rods in the group(s) with the inoperable rods are aligned to within ± 12 steps of the inoperable rods while maintaining the rod sequence and insertion limits of Specification 3.1.3.6. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, and
 - 2. The inoperable rods shall be restored to OPERABLE status within 72 hours.

Otherwise, be in HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full-length rod shall be determined to be within the group demand limit by verifying the individual rod positions at least once per 12 hours except during time intervals when the rod position deviation monitor is inoperable, then verify the group positions at least once per 4 hours.

4.1.3.1.2 Each full-length rod not fully inserted in the core shall be determined OPERABLE by movement of at least 10 steps in any one direction at least once per 92 days.

REACTIVITY CONTROL SYSTEMS

SHUTDOWN ROD INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

3.1.3.5 All shutdown rods shall be limited in physical insertion as specified in the OPERATING LIMITS REPORT.

APPLICABILITY: MODES 1* and 2**.

ACTION:

With a maximum of one shutdown rod inserted beyond the insertion limit, except for surveillance testing pursuant to Specification 4.1.3.1.2, within 1 hour either:

- a. Restore the rod to within the insertion limit specified in the OPERATING LIMITS REPORT, or
- b. Declare the rod to be inoperable and apply Specification 3.1.3.1.

SURVEILLANCE REQUIREMENTS

4.1.3.5 Each shutdown rod shall be determined to be within the insertion limit:

- a. Within 15 minutes prior to withdrawal of any rods in Control Bank A, B, C, or D during an approach to reactor criticality, and
- b. At least once per 12 hours thereafter.

* See Special Test Exceptions Specifications 3.10.2 and 3.10.3.

With K_{eff} greater than or equal to 1.

REACTIVITY CONTROL SYSTEMS

CONTROL ROD INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 The control banks shall be limited in physical insertion as specified in the OPERATING LIMITS REPORT.

APPLICABILITY: MODES 1* and 2**.

ACTION:

With the control banks inserted beyond the above insertion limits, except for surveillance testing pursuant to Specification 4.1.3.1.2:

- a. Restore the control banks to within the limits within 2 hours, or
- b. Reduce THERMAL POWER within 2 hours to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the bank position using the insertion limits specified in the OPERATING LIMITS REPORT, or
- c. Be in at least HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.6 The position of each control bank shall be determined to be within the insertion limits at least once per 12 hours except during time intervals when the Rod Insertion Limit Alarm is inoperable, then verify the individual rod positions at least once per 4 hours.

* See Special Test Exceptions Specifications 3.10.2 and 3.10.3.

* With K_{eff} greater than or equal to 1.

FIGURE 3.1-1
(THIS FIGURE IS NOT USED)

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 the target band (flux difference units) about the target flux difference. The target band is specified in the OPERATING LIMITS REPORT.

The indicated AFD may deviate outside the required target band at greater than or equal to 50% but less than 90% of RATED THERMAL POWER provided the indicated AFD is within the Acceptable Operation Limits specified in the OPERATING LIMITS REPORT and the cumulative penalty deviation time does not exceed 1 hour during the previous 24 hours.

The indicated AFD may deviate outside the required target band at greater than 15% but less than 50% of RATED THERMAL POWER provided the cumulative penalty deviation time does not exceed 1 hour during the previous 24 hours.

APPLICABILITY: MODE 1 above 15% of RATED THERMAL POWER*.

ACTION:

- a. With the indicated AFD outside of the required target band and with THERMAL POWER greater than or equal to 90% of RATED THERMAL POWER, within 15 minutes, either:
 1. Restore the indicated AFD to within the required target band limits, or
 2. Reduce THERMAL POWER to less than 90% of RATED THERMAL POWER.
- b. With the indicated AFD outside of the required target band for more than 1 hour of cumulative penalty deviation time during the previous 24 hours or outside the Acceptable Operation Limits specified in the OPERATING LIMITS REPORT and with THERMAL POWER less than 90% but equal to or greater than 50% of RATED THERMAL POWER, reduce:
 1. THERMAL POWER to less than 50% of RATED THERMAL POWER within 30 minutes, and
 2. The Power Range Neutron Flux - High* Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours.

* See Special Test Exceptions Specification 3.10.2.

* Surveillance testing of the Power Range Neutron Flux channel may be performed pursuant to Specification 4.3.1.1 provided the indicated AFD is maintained within the Acceptable Operation Limits specified in the OPERATING LIMITS REPORT. A total of 16 hours operation may be accumulated with the AFD outside of the above required target band during testing without penalty deviation.

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

- c. With the indicated AFD outside of the required target band for more than 1 hour of cumulative penalty deviation time during the previous 24 hours and with THERMAL POWER less than 50% but greater than 15% of RATED THERMAL POWER, the THERMAL POWER shall not be increased equal to or greater than 50% of RATED THERMAL POWER until the indicated AFD is within the required target band.

SURVEILLANCE REQUIREMENTS

4.2.1.1 The indicated AFD 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 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 target band when two or more OPERABLE excore channels are indicating the AFD to be outside the target band. Penalty deviation outside of the required target band shall be accumulated on a time basis of:

- a. One minute penalty deviation for each 1 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 1 minute of POWER OPERATION outside of the target band at THERMAL POWER levels between 15% and 50% of RATED THERMAL POWER.

4.2.1.3 The initial determination of target flux difference following a refueling outage shall be based on design predictions. Otherwise, the target flux difference of each OPERABLE excore channel shall be determined by measurement at least once per 92 Effective Full Power Days.

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 Specification 4.2.1.3 above or by linear interpolation between the most recently measured value and the predicted value at the end of the cycle life.

FIGURE 3.2-1
(THIS FIGURE IS NOT USED)

POWER DISTRIBUTION LIMITS

3/4.2.2 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:

$$F_q(Z) \leq \left[\frac{F_q^{RTP}}{P} \right] [K(Z)] \text{ for } P > 0.5, \text{ and}$$

$$F_q(Z) \leq \left[\frac{F_q^{RTP}}{0.5} \right] [K(Z)] \text{ for } P \leq 0.5.$$

Where:

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

$$F_q^{RTP} = \text{the } F_q \text{ limit(s) at RATED THERMAL POWER (RTP) specified in the OPERATING LIMITS REPORT, and}$$

$K(Z)$ is the function specified in the OPERATING LIMITS REPORT for a given core height location.

APPLICABILITY: MODE 1.

ACTION:

With $F_q(Z)$ exceeding its limit:

- a. 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; and
- b. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER above the reduced limit required by ACTION a., above; THERMAL POWER may then be increased provided $F_q(Z)$ is demonstrated through incore mapping to be within its limit.

FIGURE 3.2-2
(THIS FIGURE IS NOT USED)

POWER DISTRIBUTION LIMITS

3/4.2.3 RCS FLOW RATE AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

LIMITING CONDITION FOR OPERATION

3.2.3 Indicated Reactor Coolant System (RCS) total flow rate and F_{AH}^N shall be maintained as follows for four loop operation.

- a. 1) *RCS Total Flowrate $\geq 390,400$ gpm, and
- 2) **RCS Total Flowrate $\geq 371,400$ gpm, and
- b. $F_{AH}^N \leq F_{AH}^{RTP} [1.0 + PF_{AH} (1.0-P)]$

where:

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

$F_{AH}^{RTP} =$ the F_{AH}^N limit(s) at RATED THERMAL POWER (RTP) specified in the OPERATING LIMITS REPORT, and

$PF_{AH} =$ the Power Factor Multiplier(s) for F_{AH}^N specified in the OPERATING LIMITS REPORT.

Measured values of F_{AH}^N are obtained by using the movable incore detectors. An appropriate uncertainty of 4% (nominal) or greater shall then be applied to the measured value of F_{AH}^N before it is compared to the requirements.

APPLICABILITY: MODE 1.

ACTION:

With RCS total flow rate or F_{AH}^N outside the region of acceptable operation:

- a. Within 2 hours either:
 1. Restore RCS total flow rate and F_{AH}^N 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 less than or equal to 55% of RATED THERMAL POWER within the next 4 hours.

*Applicable to Unit 1 and Unit 2 until completion of cycle 5.

**Applicable to Unit 1 and Unit 2 starting with cycle 6.

POWER DISTRIBUTION LIMITS

BASES

AXIAL FLUX DIFFERENCE (Continued)

Although it is intended that the plant will be operated with the AFD within the target band required by Specification 3.2.1 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 specified in the OPERATING LIMITS REPORT while at THERMAL POWER levels between 50% and 90% of RATED THERMAL POWER. For THERMAL POWER levels between 15% and 50% of RATED THERMAL POWER, deviations of 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 1-minute average of each of the OPERABLE excore detector outputs and provides an alarm message immediately if the AFD for two or more OPERABLE excore channels are outside the target band and the THERMAL POWER is greater than 90% of RATED THERMAL POWER. During operation at THERMAL POWER levels between 50% and 90% 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.

Figure B 3/4 2-1 shows a typical monthly target band.

3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR, and RCS FLOWRATE AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

The limits on heat flux hot channel factor, RCS flowrate, 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.

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 insure that the limits are maintained provided:

- a. Control rods in a single group move together with no individual rod position differing by more than ± 12 steps, indicated, from the group demand position,
- b. Control rod groups are sequenced with overlapping groups as described in Specification 3.1.3.6,

ADMINISTRATIVE CONTROLS

REPORTING REQUIREMENTS (Continued)

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT*

6.9.1.6 The Annual Radiological Environmental Operating Report covering the operation of the facility during the previous calendar year shall be submitted prior to May 1 of each year. The report shall include summaries, interpretations, and analysis of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives outlined in (1) the ODCM and (2) Sections IV.B.2, IV.B.3, and IV.C of Appendix I to 10 CFR Part 50.

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT**

6.9.1.7 A Radioactive Effluent Release Report covering the operation of the facility during the previous year shall be submitted prior to May 1 of each year. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the facility. The material provided shall be (1) consistent with the objectives outlined in the ODCM and PCP and (2) in conformance with 10 CFR 50.36a and Section IV.B.1 of Appendix I to 10 CFR Part 50.

MONTHLY OPERATING REPORT

6.9.1.8 Routine reports of operating statistics and shutdown experience, including documentation of all challenges to the 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 Regional Administrator of the NRC Regional Office, no later than the 15th of each month following the calendar month covered by the report.

OPERATING LIMITS REPORT

6.9.1.9 Operating limits shall be established and documented in the OPERATING LIMITS REPORT (OLR) before each reload cycle or any remaining part of a reload cycle for the following:

1. Moderator Temperature Coefficient for Specification 3.1.1.3,
2. Shutdown Bank Insertion Limit for Specification 3.1.3.5,
3. Control Bank Insertion Limit for Specification 3.1.3.6,
4. Axial Flux Difference Limits, Target Band for Specification 3.2.1,
5. Heat Flux Hot Channel Factor and $K(Z)$ for Specification 3.2.2,
6. Nuclear Enthalpy Rise Hot Channel Factor, and Power Factor Multiplier for Specification 3.2.3, and
7. F_{xy} Radial Peaking Factor for Specification 4.2.2.2.

*A single submittal may be made for a multi-unit station.

**A single submittal may be made for a multi-unit station. The submittal should combine those sections that are common to all units at the station; however, for units with separate radwaste systems, the submittal shall specify the releases of radioactive material from each unit.

ADMINISTRATIVE CONTROLS

REPORTING REQUIREMENTS (Continued)

OPERATING LIMITS REPORT (Continued)

The analytical methods used to determine the operating limits shall be those previously reviewed and approved by the NRC in the following documents:

1. WCAP-9272-P-A, "Westinghouse Reload Safety Evaluations Methodology," dated July 1985 (Westinghouse Proprietary). (Methodology for Specification: Shutdown Bank Insertion Limit, Control Bank Insertion Limit, Axial Flux Difference, Heat Flux Hot Channel Factor, and Nuclear Enthalpy Rise Hot Channel Factor).
2. WCAP-8385, "Power Distribution Control and Load Following Procedures-Topical Report," dated September 1974 (Westinghouse Proprietary). (Methodology for Specification: Axial Flux Difference, Constant Axial Offset Control).
3. WCAP-9220-P-A, "Westinghouse ECCS Evaluation Model-1981 Version," Revision 1, dated February 1982 (Westinghouse Proprietary). (Methodology for Specification: Heat Flux Hot Channel Factor).
4. WCAP-9561-P-A, "BART A-1: A Computer Code for the Best Estimate Analysis of Reflood Transients," including Addendum 3, "Special Report - Thimble Modeling in Westinghouse ECCS Evaluation Model," Revision 1, dated July 1986 (Westinghouse Proprietary). (Methodology for Specification: Heat Flux Hot Channel Factor).
5. WCAP-10266-P-A, "The 1981 Version of the Westinghouse ECCS Evaluation Model Using the BASH Code," Revision 2, dated March 1987, including Addendum 1 "Power Shape Sensitivity Studies," Revision 2-P-A, dated December 15, 1987, and Addendum 2 "BASH Methodology Improvements and Reliability Enhancements," Revision 2, dated May 1988 (Westinghouse Proprietary). (Methodology for Specification: Heat Flux Hot Channel Factor).
6. NFSR-0016, "Commonwealth Edison Company Topical Report on Benchmark of PWR Nuclear Design Methods," dated July 1983. (Methodology for Specification: Shutdown Bank Insertion Limit, Control Bank Insertion Limit, Axial Flux Difference, Heat Flux Hot Channel Factor, and Nuclear Enthalpy Rise Hot Channel Factor).
7. NFSR-0081, "Commonwealth Edison Company Topical Report on Benchmark of PWR Nuclear Design Methods Using the Phoenix-P and ANC Computer Codes," dated July 1990. (Methodology for Specification: Shutdown Bank Insertion Limit, Control Bank Insertion Limit, Axial Flux Difference, Heat Flux Hot Channel Factor, Nuclear Enthalpy Rise Hot Channel Factor, and Moderator Temperature Coefficient).
8. WCAP-10079-P-A, "NOTRUMP, A Nodal Transient Small Break and General Network Code," dated August 1985 (Westinghouse Proprietary). (Methodology for Specification: Heat Flux Hot Channel Factor and Nuclear Enthalpy Rise Hot Channel Factor).