

DEC 2 - 1970

Docket No. 50-219

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 E. Fleury, S. Teets

Jersey Central Power & Light Company
 ATTN: Mr. R. H. Sims, Vice President
 Madison Avenue at Punch Bowl Road
 Morristown, New Jersey 07960

Gentlemen:

Amendment No. 2 to Provisional Operating License No. DPR-16 and a Notice of Issuance, which is being filed with the Office of the Federal Register for publication, are enclosed. The amendment authorizes the operation of the Oyster Creek Nuclear Power Plant Unit No. 1 at power levels up to a maximum of 1690 megawatts (thermal) and incorporates changes in the Technical Specifications appended to the license to provide for this operation.

Sincerely,

Original Signed by
Peter A. Morris

Peter A. Morris, Director
 Division of Reactor Licensing

Enclosures:

1. Amendment No. 2 to License No. DPR-16
 2. Federal Register Notice
 3. Safety Evaluation
- cc: George F. Trowbridge, Esquire
 Shaw, Pittman, Potts, Trowbridge & Madden
 910 - 17th Street, N. W.
 Washington, D. C. 20006

Dispatched 12/3/70

F. W. ...

OFFICE ▶	DRL	DRL	OGC	DRL	DRL	DRL
SURNAME ▶	SATeets TWambach	ERFleury RJSchemel	<i>AW</i>	DJSkovholt	FSchroeder	PAMorris
DATE ▶	11/19/70	11/27/70	12/1/70	12/1/70	12/2/70	12/2/70

AGREEMENT TO INDEMNITY AGREEMENT NO. B-37

AGREEMENT NO. 5

Effective APR 9 1969
, Indemnity Agreement No. B-37, dated October 3, 1967, as amended, between Jersey Central Power & Light Company and the Atomic Energy Commission, is hereby further amended as follows:

Item 2a of the Attachment to the indemnity agreement is deleted in its entirety and the following substituted therefor:

Item 2 - Amount of financial protection

a. \$ 1,000,000 (From 12:01 a.m., October 3, 1967, to 12:00 midnight, APR 8 1969, inclusive)

~~\$2,000,000~~ (From 12:01 a.m., APR 9 1969)

Item 3 of the Attachment to the indemnity agreement is deleted in its entirety and the following substituted therefor:

Item 3 - License number or numbers

SNM-1037

(From 12:01 a.m., October 3, 1967, to 12:00 midnight, APR 8 1969, inclusive)

DRR-16

(From 12:01 a.m., APR 9 1969)

Item 4 of the Attachment to the indemnity agreement is deleted in its entirety and the following substituted therefor:

Item 4 - Location

The fenced switchyard depicted in Drawing No. 4002, attached to the Licensee's letter dated September 27, 1967, as amended by the Licensee's telegram dated October 13, 1967; the entire Reactor Building; and the alleyways or roadways between the switchyard and the Reactor Building used for transportation of the fuel. The location is on the Licensee's Oyster Creek Nuclear Power Station site, Lacey Township, Ocean County, New Jersey.

(From 12:01 a.m., October 3, 1967, to 12:00 midnight, APR 8 1969, inclusive)

April 9, 1969

All buildings and premises located in Lacey Township, Ocean County, State of New Jersey, and known as Oyster Creek Nuclear Generating Station Unit #1 as depicted on Drawing C-59179, attached hereto and made a part hereof. This includes all property bounded by Jersey Central Power & Light Company's property line on the north, east, and south sides and a line contiguous with the westerly fence of the switchyard extending north and south to the northern and southern property lines.

(From 12:01 a.m., APR 9 1969)

Stat

Item 5 of the Attachment to the indemnity agreement is amended by adding the following:

Nuclear Energy Liability Policy (Facility Form) No. MF-44 issued by Mutual Atomic Energy Liability Underwriters.

FOR THE UNITED STATES ATOMIC ENERGY COMMISSION

Original Signed by
Eber R. Price, Director
Div. of State & Licensee

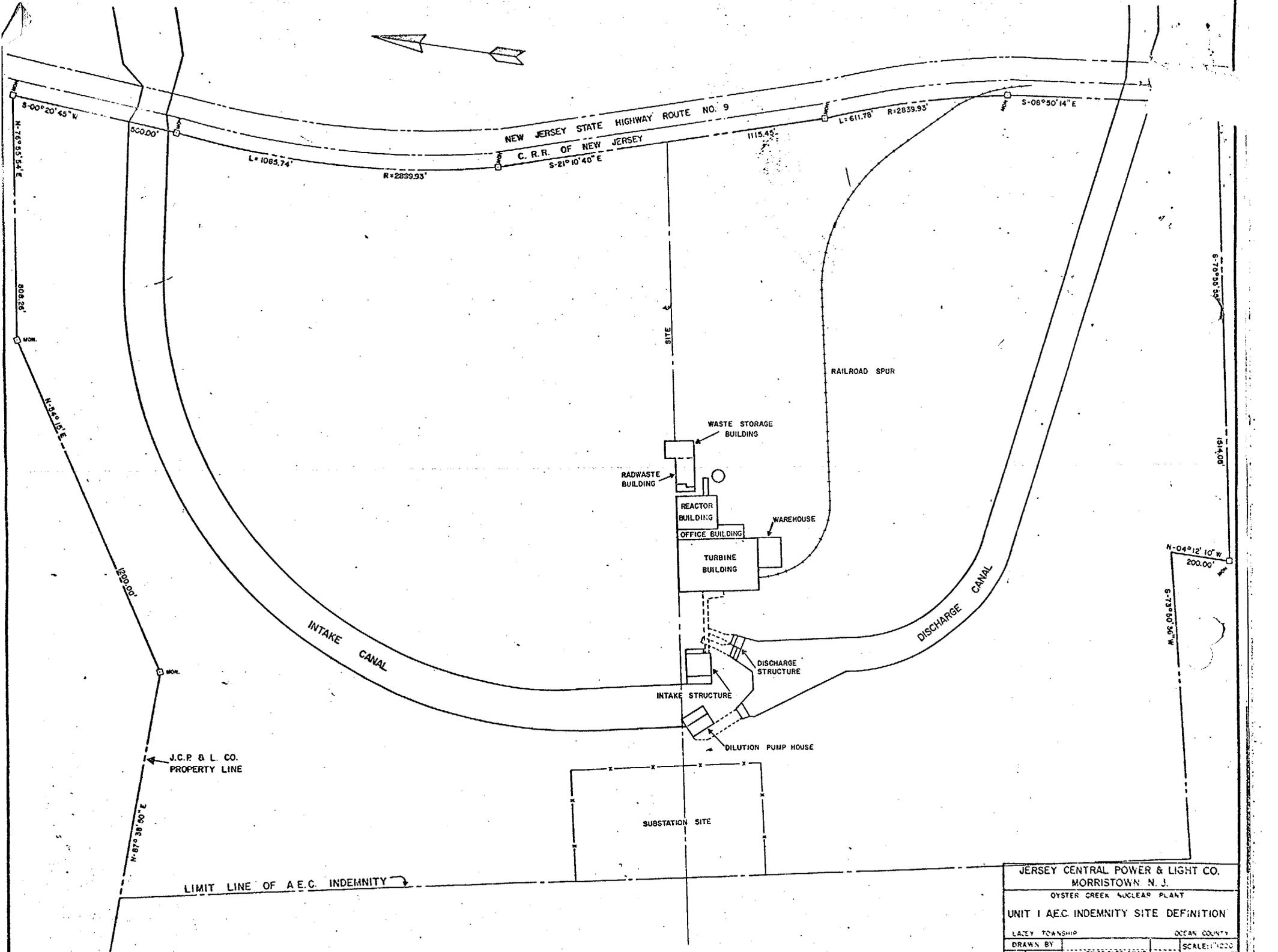
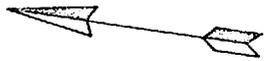
Eber R. Price, Director
Division of State and Licensee Relations

Accepted _____, 1969

By _____
JERSEY CENTRAL POWER & LIGHT COMPANY

DISTRIBUTION:
Licensee - 2 orig.
File
PDR
OGC
OC
CO
Indemnity
SLR Reading
Branch Reading

OFFICE	SLR: I&EE	OGC	SLR: PDR		
SURNAME	JSaltzman:esc	<i>[Signature]</i>	ERPrice		
DATE	3/5/69	3/10/69	4/9/69		



LIMIT LINE OF A.E.C. INDEMNITY

JERSEY CENTRAL POWER & LIGHT CO. MORRISTOWN, N. J. OYSTER CREEK NUCLEAR PLANT			
UNIT I A.E.C. INDEMNITY SITE DEFINITION			
LATEY TOWNSHIP		OCEAN COUNTY	
DRAWN BY W 2 2 4 100	CHECKED BY 4554	SCALE: 1"=200' DRAWING NO.	C-59179

April 3, 1969

REACTOR DATA INPUT FORM

Control #274

A. IDENTIFYING & DESCRIPTIVE DATA

REACTORS

01. PROGRAM CODE 211	12. PROJ. NO.	03. DOCKET NO. 50-219	09. TASK NO. TOL	10. TYPE OF REACTOR	11. CLASS OF REACTOR
18. APPLICANT					19. NAME OF REACTOR
21. STREET-BUILDING				POWER LEVEL	
24. CITY				27. STATE	30. ZIP
		ELEC.		85. UNIT	66. REQUESTED
		THER.		69. UNIT	70. REQUESTED
				71. DESIGN	72. AUTHORIZED
				Megaw	1600
				1600	1600

B. ACTION DATA

BASIC PROCESSING STAGES

PRE-APPLICATION CONSIDERATION	ACTIV. CD.	74. FIRST ACTION			78. END ACTION (DATE APPL. CONSID.)				
	31	YR.	MO.	DAY	YR.	MO.	DAY		
PROCESSING APPLICA. FOR CONSTRUCTION	35	APPLIC. REC.			CONSTRUCTION PER. ISSUED			78. LATEST COMPL. DATE	
		83. YR.	MO.	DAY	76. NO.	77. YR.	MO.		DAY
PROCESSING OPERATING AUTHORITY	PROVIS- IONAL	36	STARTED			PROV. OP. AUTHORITY ISSUED			39. EXPIRATION DATE
	80. YR.		MO.	DAY	81. NO.	82. YR.	MO.	DAY	
	FULL TERM	38	STARTED			FULL TERM AUTH. ISSUED			
			84. YR.	MO.	DAY	85. NO.	36. YR.	MO.	DAY

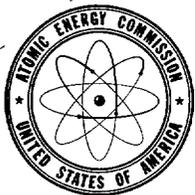
SUPPLEMENTARY ACTION

TASK NO. (SAME AS FIELD 09)	86. DATE SUPPLE. REQUEST REC'D.	YR.	MO.	DAY	88. bbb	87. DATE SUPPLEMENTARY REQUEST (TASK) COMPLETED	YR.	MO.	DAY
42. PURPOSE OF REQUEST (TASK)					54. RESULT OF TASK (AM. NO. CHANGE NO. ETC.)				

Initial Operation

C. STATISTICS

TYPE OF ACTION REQUESTED AND TAKEN		48. REQ.	51. TAK.	52. VOID INPUT ENTERED UNDER CODES IN FIELDS 01, 03 OR 12, AND 09 AS RECORDED ABOVE AND ACTIVITY CODE _____
A	REACTOR CONCEPT REVIEW			53. CONSOLIDATE INPUT ENTERED UNDER CODES IN FIELDS 01, 03 OR 12, AND 09 AS RECORDED ABOVE AND ACTIVITY CODE _____ WITH PROG. _____ PROJ. _____ TASK _____ ACT. _____
B	PRELIMINARY SITE REVIEW			
C	PRECONSTRUCTION STAGE REVIEW			
D	CONSTRUCTION PERMIT (C.P. REVIEW)			
E	AUTHORITY TO OPERATE (OP. STAGE REVIEW)	x	x	
F	AUTHORITY TO POSSESS ONLY			
G	AMENDMENT TO CONSTRUCTION PERMIT			
H	AMENDMENT TO OPERATING LICENSE			
I	CHANGE TO TECHNICAL SPECIFICATIONS			
J	EXEMPTION			
K	CONSTRUCTION PERMIT EXTENSION			
L	OPERATING LICENSE (OR AUTHORITY) EXTENSION			
M	DRL ORDER			
N	SPECIAL AUTHORITY			
T	LICENSE (OR AUTHORITY) TERMINATED OR EXPIRED			
O	OTHER (EXPLAIN)			



UNITED STATES
ATOMIC ENERGY COMMISSION

WASHINGTON, D.C. 20545

December 2, 1970

Docket No. 50-219

Jersey Central Power & Light Company
ATTN: Mr. R. H. Sims, Vice President
Madison Avenue at Punch Bowl Road
Morristown, New Jersey 07960

Gentlemen:

Amendment No. 2 to Provisional Operating License No. DPR-16 and a Notice of Issuance, which is being filed with the Office of the Federal Register for publication, are enclosed. The amendment authorizes the operation of the Oyster Creek Nuclear Power Plant Unit No. 1 at power levels up to a maximum of 1690 megawatts (thermal) and incorporates changes in the Technical Specifications appended to the license to provide for this operation.

Sincerely,

A handwritten signature in cursive script that reads "Peter A. Morris".

Peter A. Morris, Director
Division of Reactor Licensing

Enclosures:

1. Amendment No. 2 to
License No. DPR-16
2. Federal Register Notice
3. Safety Evaluation

cc: George F. Trowbridge, Esquire
Shaw, Pittman, Potts, Trowbridge & Madden
910 - 17th Street, N. W.
Washington, D. C. 20006



UNITED STATES
ATOMIC ENERGY COMMISSION

WASHINGTON, D.C. 20545

JERSEY CENTRAL POWER & LIGHT COMPANY

DOCKET NO. 50-219

AMENDMENT TO OPERATING LICENSE

Amendment No. 2
License No. DPR-16

The Atomic Energy Commission ("the Commission") has found that:

- a. The application for amendment dated May 7, 1970, and supplements dated June 2, August 31, September 17 and November 18, 1970, comply with the requirements of the Atomic Energy Act of 1954, as amended ("the Act"), and the Commission's regulations set forth in 10 CFR, Chapter I;
- b. 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
- c. Prior public notice of proposed issuance of this amendment is not required since the amendment does not involve significant hazards considerations different from those previously evaluated.

Accordingly, Facility License No. DPR-16 is hereby further amended by restating subparagraphs 3.A. and 3.B.

Section 3.A:

"A. Maximum Power Level

Jersey Central is authorized to operate the facility at steady-state power levels up to a maximum of 1690 megawatts (thermal).

Section 3.B:

"B. Technical Specifications

The Technical Specifications contained in Appendix A, as modified by Attachment A appended hereto (designated as Change No. 5), are hereby incorporated into this license. Jersey Central may operate the facility at

power levels not in excess of 1690 megawatts (thermal) in accordance with the Technical Specifications and may make changes therein only when authorized by the Commission in accordance with the provisions of Section 50.59 of 10 CFR Part 50, 'Licensing of Production and Utilization Facilities'."

This amendment is effective as of the date of issuance.

FOR THE ATOMIC ENERGY COMMISSION



Peter A. Morris, Director
Division of Reactor Licensing

Enclosure:
Attachment A - Change No. 5
to Technical Specifications

Date of Issuance: December 2, 1970

ATTACHMENT A TO AMENDMENT NO. 2
JERSEY CENTRAL POWER & LIGHT COMPANY
LICENSE NO. DPR-16
CHANGE NO. 5 TO APPENDIX A

Make the following changes:

<u>Title Page</u>	<u>Changes</u>
Section 1	
Paragraph 1.16 <u>RATED FLUX</u>	Second line of sentence change "1600" to "1690".
Section 2	
Paragraph 2.1. <u>SAFETY LIMIT - FUEL CLADDING INTEGRITY</u>	
<u>Bases</u>	6th paragraph (1st paragraph on page 2.1-3) - delete the first line and replace with the following: "The power shape assumed in the calculation of these curves results in a total peaking factor of 3.08." Change the figure of "3.08" in the fourth and fifth sentences to "3.04". 10th paragraph (last paragraph on page 2.1-3) - change the wording "(20% or rated)" to "(19% of rated)". 11th paragraph (1st paragraph on page 2.1-4) - change reference figures "(2,3,4)" to "(2,3,4,8)". 12th paragraph (2nd paragraph on page 2.1-4) - delete the second sentence which begins "These analyses" and ends "neutron flux setting".

Title Page

References

Figure - Page 2.1.6

Paragraph 2.2. SAFETY LIMIT -
REACTOR COOLANT SYSTEM PRESSURE

Bases - Page 2.2-1

References

Paragraph 2.3. LIMITING SAFETY
SYSTEM SETTINGS

Specifications

Changes

Add the following reference:

"(8) Licensing Application Amendment No. 55,
Section 4."

Replace Figure TS-1 with the attached
revised Figure 2.1.1.

Second sentence of the fifth paragraph,
delete the words "neutron flux scram" and
insert "turbine trip scram or the generator
load rejection scram in combination with the."
Also, change the reference "(3)" at the end
of the fourth sentence to "(2)".

Change reference "(2)" to read:

License Amendment No.55, Section 4.

Make the following changes in column under
LIMITING SAFETY SYSTEM SETTINGS:

1. Change the figures in the first line
opposite Function No. 1 to read
" $(8.20 \times 10^{-7}) W + 63.6$ ".
2. Change the figures opposite Function No.
2 (a) APRM to read: " 8.20×10^{-7})
 $W + 51.7$ ".
3. Change the figures in the last line
for Function No. 11 to read:
" 66.2×10^6 ".

Title Page

Specifications

Bases

Changes

Also add the following to the table:

<u>Function</u>	<u>LIMITING SAFETY SYSTEM SETTINGS</u>
"12) Turbine Trip Scram	10% turbine stop valve(s) closure from full open
13) Generator Load Rejec- tion Scram	Initiate upon loss of oil pressure from turbine acceleration- relay"

Paragraph 3, second line of first sentence, change "61 x 10⁶ lbs/hr" to "66.2 x 10⁶ lbs/hr"

Delete the second sentence which begins "However, all plant" and ends "scram setting".

Also, change the reference "(3,4)" at the end of the third sentence to reference "(3,4,12)", and delete the fourth sentence which begins with "For example" and ends "of 1.0^(3,4)".

6th paragraph (4th paragraph on page 2.3-3) - in the last sentence change "74%" to "70%" and add reference (7) at the end of the sentence.

7th paragraph (5th paragraph on page 2.3-3) - change "33%" to "27%" and "20%" to "19%".

8th paragraph (2nd paragraph on page 2.3-4) - in the first sentence add the words "anticipatory scrams" between the words "scram" and "reactor".

In the second sentence delete "APRM neutron flux scram" and insert "other scrams".

Title Page

Bases

Changes

After the fourth sentence add the following sentence:

"With the addition of the turbine anticipatory trips, the turbine trip with failure of the bypass system at 1690 MWt is less severe than the transient described in the previous sentence which was analyzed at 1600 MWt without the anticipatory trips ⁽⁷⁾."

9th paragraph (1st paragraph on page 2.3-5), - third sentence - delete the words "reactor pressure and neutron flux".

10th paragraph (2nd paragraph on page 2.3-5) - add the following to the last sentence:

"for a transient analyzed from 1600 MWt."

Also add the following sentence:

"Operation at 1690 MWt will have little effect on either the maximum pressure or maximum heat flux experienced during the resulting transient ⁽⁷⁾."

Add the following paragraphs to the end of Section 2.3 Bases:

"The turbine stop valve(s) scram anticipates the pressure, neutron flux, heat flux increase caused by the rapid closure of the turbine stop valve(s) and failure of the turbine bypass system. With a scram setting of 10% of valve closure from full open and with a failure of the turbine bypass system at 1690 MWt, the peak pressure will remain well below the first safety valve setting and no thermal limits are approached ^(7,12)."

Title Page

Changes

Bases

The generator load rejection scram is provided to anticipate the rapid increase in pressure and neutron flux resulting from fast closure of the turbine control valves to a load rejection and failure of the turbine bypass system. This scram is initiated by the loss of turbine acceleration relay oil pressure. The timing for this scram is almost identical to the turbine trip and the resultant peak pressure and MCHFR are essentially the same."

References

Change reference (7) to read:

"License Application Amendment No. 55, Section 4".

Add the following reference:

"(12) License Application Amendment No. 55, Section 7."

Section 3

Paragraph 3.1. PROTECTIVE INSTRUMENTATION

Bases

Add a new paragraph after the 11th paragraph (paragraph 4 on page 3.1-4) as follows:

"Bypass of the turbine anticipatory trip below 45% turbine rated steam flow would be required if the flow control line were being changed for a larger increase in power. However, adding the bypass at this value gives additional margin at this time."

Add the attached new page 3.1-7a

Notes (page 3.1-12)

To Table 3.1.1. add the following:

"j. not required below 45% of turbine rated steam flow."

Title Page

Changes

Paragraph 3.2. REACTIVITY CONTROL

Bases

Paragraph 17 (4th paragraph on page 3.2-6), second sentence - change "(1637 gal, 19.6%) to "(1937 gal, 19.6%) (11)" and "50 minutes" to "60 minutes". In the third sentence, change "(3137 gal, 10.2%)" to "(3737 gal, 10.3%) (11)", and "100 minutes" to "120 minutes". In the fourth sentence, change "50-100 minutes" to "60-120 minutes".

References

Add the following reference:

"(11) License Application Amendment No. 55, Section 2."

Replace Figure 3.2.1 with the attached revised Figure 3.2.1.

Section 3

Paragraph 3.8. ISOLATION CONDENSER

Bases

Second paragraph of Bases, last sentence, change "1600 MWt" to "1690 MWt".

Section 4

Paragraph 4.1. PROTECTIVE INSTRUMENTATION

Add attached new page no. 4.1-6a to Table 4.1.1.

FIGURE 2.1.1

FUEL CLADDING INTEGRITY SAFETY LIMIT
(Revised DEC 2 - 1970)

NOTES:

1. Rated Power is 1690 Mwt
2. Rated Flow is 66.2×10^6 lb/hr.
3. Total Peaking Factor is 3.08 (basis for these curve calculations)
4. Total Peaking Factor - Operational Limit is 3.04 (see equation below)
5. Core Pressure is ≥ 600 psia
6. Water Level is > 10 ft. 7 in. above Top of the Active Fuel

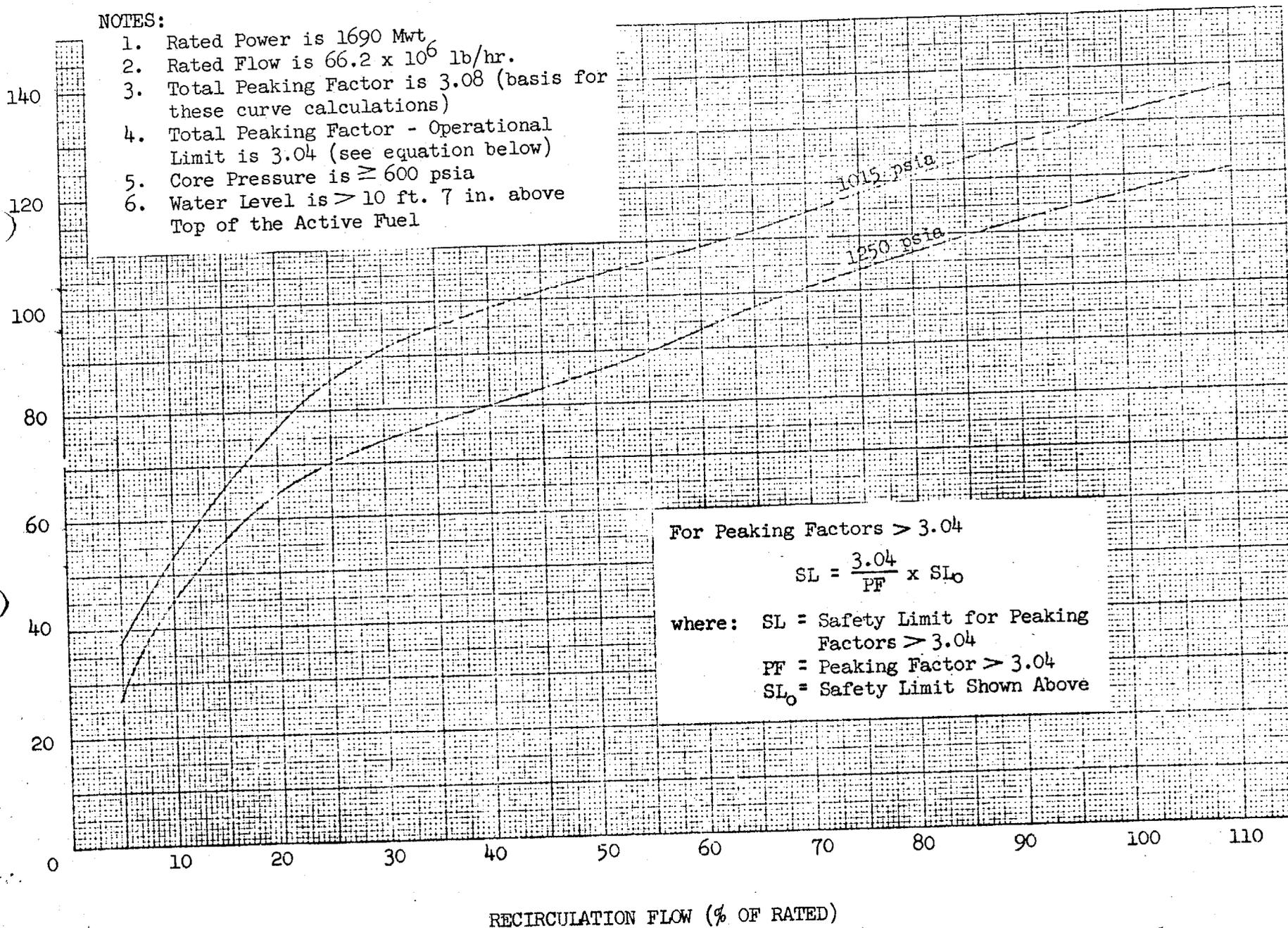


TABLE 3.1.1 PROTECTIVE INSTRUMENTATION REQUIREMENTS

Function	Trip Setting	Reactor Modes in which Function Must Be Operable				Min. No. of Operable or Operating (Tripped) Trip Systems	Min. No. of Operable Instrument Channels Per Operable Trip Systems	Action Required
		Shutdown	Refuel	Startup	Run			
11. Turbine Trip Scram	**				X(j) 2	4	Insert Control Rods	
12. Generator Load Rejection Scram	**				X(j) 2	2		

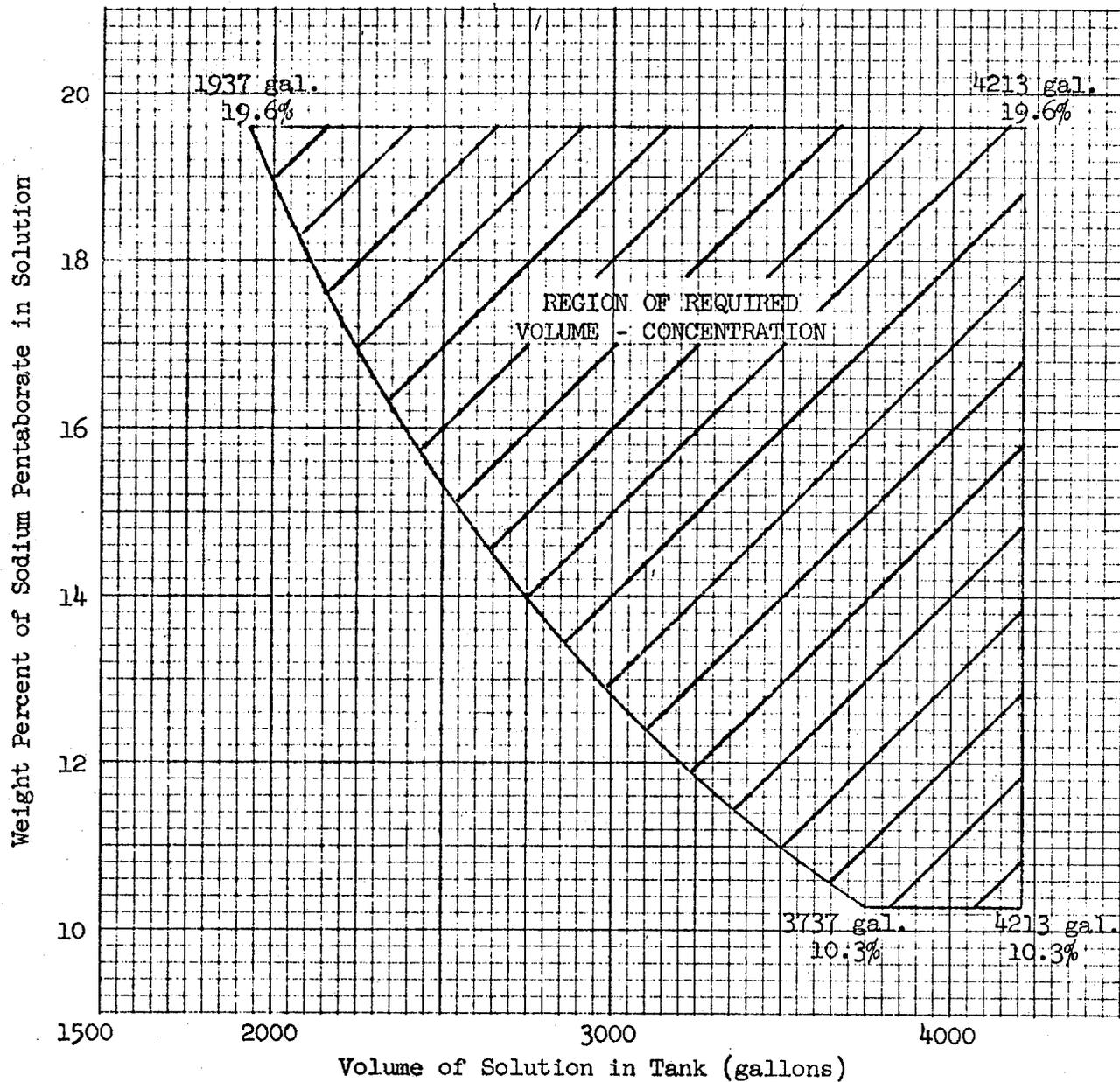


FIGURE 3.2.1 (Revised DEC 2 - 1970): SODIUM PENTABORATE SOLUTION VOLUME - CONCENTRATION REQUIREMENTS

TABLE 4.1.1 (cont'd)

<u>Instrument Channel</u>	<u>Check</u>	<u>Calibrate</u>	<u>Test</u>	<u>Remarks (applies to Test & Calibration)</u>	
23. Turbine trip scram	N A		Every 3 months		*
Generator Load Rejection Scram	N A	Every 3 months	Every 3 months		*

UNITED STATES ATOMIC ENERGY COMMISSION

DOCKET NO. 50-219

JERSEY CENTRAL POWER & LIGHT COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO PROVISIONAL OPERATING LICENSE

The Atomic Energy Commission ("the Commission") has issued, effective as of the date of issuance, Amendment No. 2 to Provisional Operating License No. DPR-16 dated April 9, 1969. The amendment authorizes the Jersey Central Power & Light Company to operate the Oyster Creek Nuclear Power Plant Unit No. 1 at power levels up to a maximum of 1690 megawatts (thermal).

The Commission has found that the application for the amendment complies with the requirements of the Atomic Energy Act of 1954, as amended ("the Act"), and the Commission's regulations published in 10 CFR Chapter I. The Commission has made the findings required by the Act and the Commission's regulations which are set forth in the amendment, and has concluded that the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Within fifteen (15) days from the date of publication of the notice in the FEDERAL REGISTER, the applicant may file a request for a hearing and any person whose interest may be affected by this proceeding may file a petition for leave to intervene. Requests for a hearing and petitions to intervene shall be filed in accordance with the Commission's "Rules of Practice" 10 CFR Part 2. If a request for a hearing or a petition for leave to intervene is filed within the time prescribed in this notice, the Commission will issue a notice of hearing or an appropriate order.

For further details with respect to this amendment, see (1) the licensee's application for license amendment dated May 7, 1970, and supplements dated June 2, August 31, September 17 and November 18, 1970, (2) the amendment to the provisional operating license, and (3) the Safety Evaluation prepared by the Division of Reactor Licensing, which are available for public inspection at the Commission's Public Document Room at 1717 H Street, N. W., Washington, D. C. Copies of items (2) and (3) may be obtained upon request sent to the U. S. Atomic Energy Commission, Washington, D. C. 20545, Attention: Director, Division of Reactor Licensing.

Dated at Bethesda, Maryland, this 2nd day of December 1970.

FOR THE ATOMIC ENERGY COMMISSION



Peter A. Morris, Director
Division of Reactor Licensing

UNITED STATES ATOMIC ENERGY COMMISSION
SAFETY EVALUATION BY THE DIVISION OF REACTOR LICENSING

DOCKET NO. 50-219

JERSEY CENTRAL POWER AND LIGHT COMPANY

OYSTER CREEK NUCLEAR PLANT

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- 2.0 Site and Environment
- 3.0 Core Characteristics
 - 3.1 Thermal and Hydraulic Analysis
 - 3.2 Reactivity Control
- 4.0 Instrumentation and Control
 - 4.1 Control Rod Drives
 - 4.2 Addition of Turbine Trip and Load Rejection Scrams
- 5.0 Analysis of Accidents and Expected Transients
 - 5.1 Accident Analysis
 - 5.2 Transient Analysis
- 6.0 1690 MWt Power Test Program
- 7.0 Technical Specification Changes
- 8.0 Conclusion

1.0 INTRODUCTION

On August 1, 1969, the Atomic Energy Commission issued Amendment No. 1 to Provisional Operating License (POL) No. DPR-16 to Jersey Central Power & Light Company which authorizes operation of the Oyster Creek Nuclear Power Plant, Unit No. 1, at steady-state power levels up to a maximum of 1600 MWt. By application dated May 5, 1970, Jersey Central Power & Light Company applied for an amendment to permit operation at steady-state power levels up to 1690 MWt.

Initial criticality was achieved on May 3, 1969. After low power testing was completed, the licensed power level (1600 MWt) was achieved on December 7, 1969, and the one-hundred-hour, full power demonstration run was completed on December 22, 1969. Tests were conducted at 1600 MWt to evaluate core and plant performances.

We have evaluated the Oyster Creek Nuclear Power Plant for operation at power levels up to 1690 MWt with the present core loading. This evaluation is based on: review of a year of operation at power levels up to 1600 MWt; data obtained during the startup test program; and examination of the accidents and transients analyzed in the Facility Description and Safety Analysis Report for the Oyster Creek plant as amended by Amendments No. 55 and No. 63.

In order to reduce the severity of the transient that would result in the event that the bypass valves were to fail to open upon a turbine trip, the applicant has installed a turbine trip scram and a load rejection scram.

The Advisory Committee on Reactor Safeguards (ACRS) completed its review of the application for operation at power levels up to 1690 MWt at its 127th meeting (November 12-14, 1970). A copy of the ACRS report is attached.

2.0 SITE AND ENVIRONMENT

The evaluations of the potential consequences of Design Basis Accidents (DBA), given in the Facility Description and Safety Analysis Report (FDSAR), are based on operation at a power level of 1860 MWt. Since our calculated off-site doses are within the 10 CFR 100 guidelines for the 1860 MWt power level, we have concluded that the present site is suitable for operation of the Oyster Creek plant at power levels up to 1690 MWt.

The concentrations of radioactive effluents released from the plant during the first six months of operation at 1600 MWt have been well below the limits set forth in the Technical Specifications. The effluent radioactivity levels are not expected to increase significantly if

the power level is increased to 1690 MWt.

3.0 CORE CHARACTERISTICS

3.1 Thermal and Hydraulic Analysis

The applicant has analyzed the thermal and hydraulic characteristics of the core for operation at a steady-state power level of 1690 MWt with a recirculation flow rate of 66×10^6 lbs/hr and using a power peaking factor of 3.04 determined by flux distribution measurements made with in-core fission chambers during startup and power operation. Based on this analysis, the expected minimum critical heat flux ratio (MCHFR) is greater than 2.47 at full power and greater than 1.5 at 20% overpower. The calculated MCHFR at the current power of 1600 MWt, with a recirculation flow rate of 61×10^6 lbs/hr and a power peaking factor of 3.08, is 2.47 at full power and 1.52 at 20% overpower.

These factors and other important thermal and hydraulic parameters at 1600 and 1690 MWt are compared in Table 1.

TABLE 1

OYSTER CREEK THERMAL AND HYDRAULIC OPERATING PARAMETERS
AT 1600 MWt AND 1690 MWt

	1600	1690
Core Thermal Power (MWt)	1015	1015
Reactor Pressure (psia)	5.85	6.27
Steam Flow Rate (10^6 lb/hr)	61	66.2
Recirculation Flow Rate (10^6 lb/hr)	29.9	29.7
Core Subcooling (Btu/lb)	304	308
Feedwater Temperature ($^{\circ}$ F)	0.967	0.967
Heat Generation in Fuel (Fraction)	49,137	49,137
Heat Transfer Area (ft^2)	33.6	35.5
Average Power Density (kW/l)	107,470	113,510
Average Heat Flux (Btu/hr- ft^2)	331,000	345,000
Peak Heat Flux (Btu/hr- ft^2)	14.5	15.1
Maximum Heat Generation (kW/ft)	3,550	3,660
Maximum UO ₂ Temperature ($^{\circ}$ F)		
Power Peaking Factors		
Local	1.30	1.30
Axial	1.57	1.57
Radial (Relative Assembly)	1.51	1.49
Total	3.08	3.04
MCHFR at Full Power	2.47	2.47
MCHFR at 120% Overpower	1.52	1.50

3.2 Reactivity Control

The reactivity shutdown margin required by the Technical Specifications was verified during startup testing. This verification included measurements with permitted inoperable control rods. The response of the plant to recirculation flow control was measured and found to be in good agreement with the predicted response. We have reviewed the data from these tests and have concluded that operation at 1690 MWt can be accomplished without modification of the existing limits.

4.0 INSTRUMENTATION AND CONTROL

During plant operation, the protection system has always performed its intended function. There have been no unsafe failures of the system.

4.1 Control Rod Drives

To monitor continued satisfactory operation of the control rod drives during operation, the scram times of twenty-six selected drives are recorded during reactor scrams. The withdrawal stall flows of all drives are checked once a month and any increase of drive pressure when moving control rods during operation or drive exercising is observed and recorded. After a reactor scram, the buffer action of the twenty-six selected drives is evaluated for erratic behavior and the time between reactor scram and high discharge volume trip is monitored. If the total withdrawal stall flow should reach 550 gpm for all 137 drives, Jersey Central will reevaluate control rod performance. We have concluded that the proposed surveillance program is adequate to monitor control rod drive performance and to provide early evidence of drive deterioration.

4.2 Addition of Turbine Trip & Load Rejection Scrams

To reduce the severity of the transient that would result from a turbine trip if the bypass valves should fail to open, Jersey Central has installed two additional scrams. These scrams are (a) a turbine trip scram, actuated by position switch indication of turbine stop valve closure, and (b) a load rejection scram, actuated by a signal from the turbine control valve acceleration relay.

We have determined that the turbine trip scram circuits are redundant, independent, and testable and in all respects satisfy the requirements of the Institute of Electrical and Electronics Engineers "Proposed IEEE Criteria for Nuclear Power Plant Protection Systems" (IEEE-279). The load rejection scram does not satisfy the

IEEE-279 criteria in all respects, but since this scram function is merely anticipatory, we conclude that its design is satisfactory for the purpose intended.

An automatic bypass circuit has been added as part of the modification. This circuit will defeat the turbine trip and load rejection scrams when the reactor is operating at less than 45% of full power. The power indication for this bypass is determined by sensing the turbine first stage pressure by four pressure switches mounted on two instrument lines. We have determined that the automatic removal aspects of this circuit conform to the IEEE-279 criteria and are acceptable.

Both of these scram functions also are bypassed automatically below a reactor pressure of 600 psi. Jersey Central has provided a bypass removal circuit to restore the turbine trip scram function above a reactor pressure of 600 psi. The design of this circuit satisfies the IEEE-279 criteria.

5.0 ANALYSIS OF ACCIDENTS AND EXPECTED TRANSIENTS

5.1 Accident Analysis

In our review of Jersey Central's application for a provisional operating license, four design basis accidents (loss of primary system coolant, steam line break outside the drywell, drop of fuel assembly during refueling, and control rod drop) were evaluated. These accidents were evaluated on the basis of power operation at 1860 MWt. We conclude that operation at 1690 MWt does not require reanalysis of these accidents.

We have reevaluated the predicted performance of the core spray Emergency Core Cooling System (ECCS) in light of the results provided from the BWR FLECHT test program. We have concluded that the design of the core spray ECCS is satisfactory for the proposed power level.

5.2 Transient Analysis

Jersey Central has reevaluated those transients which result in the closest approach to limiting design and performance criteria. These transients are main steam isolation valve closure, loss of power to five recirculation pumps, seizure of one recirculation pump, loss of feedwater flow, turbine trip with accompanying bypass failure, and control rod withdrawal error. Except for the last two of these

transients, the analysis shows that design and performance criteria will be met under proposed conditions of operation at 1690 MWt. The validity of these predictions is supported by consideration that the data obtained during the power testing program substantiate similar predictions made prior to operation.

The severity of the transient that would result from a turbine trip in the event that bypass valves should fail to open is markedly reduced by effecting a scram early in the occurrence. With a scram signal initiated by switches when the turbine stop valve closes to the 90% open position, calculations indicate the transient would be less severe at 1690 MWt than it would have been at 1600 MWt without the scram. The applicant has chosen to install this scram.

Data obtained during plant startup and calculations based on more refined analytical techniques have demonstrated that a larger safety margin is required for the rod block function. This information shows that in the event of a rod withdrawal error, the power peaking factor will be larger than originally expected. In order to meet original performance criteria (MCHFR not less than 1.5) the limiting safety system setting on rod block will be decreased by about 40 MWt.

6.0 1690 MWt POWER TEST PROGRAM

Following approval of the requested power increase, the applicant will conduct a test program to demonstrate acceptable performance at 1690 MWt. These tests will include determination of heat balance, MCHFR and heat flux, axial power distribution, average power range monitor calibration, local power range monitor calibration, rod calibration, response to flow changes and pressure regulator changes, and radiation measurements. Prior to raising the power level, the applicant will obtain a set of base point data for core and system performance at 1600 MWt so that any changes that might have occurred since the original startup tests would not be attributed to the change in power level. We have concluded that the proposed tests will provide the information necessary to demonstrate the adequacy of the Oyster Creek plant to operate at the increased power level of 1690 MWt.

7.0 TECHNICAL SPECIFICATION CHANGES

The only changes required to the Technical Specifications are as follows:

1. Three changes to reflect the new values for 100% power and

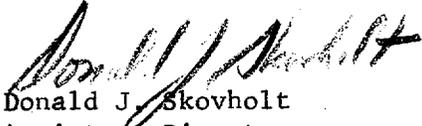
100% recirculation flow, and to provide the additional safety margin for the rod block function.

2. Four changes to accommodate the addition of the turbine trip scram and the load rejection scram with appropriate surveillance.
3. One change to provide for increased boron concentration in the standby liquid control system.

We have evaluated these changes and we conclude that they are adequate to cover the design changes proposed.

8.0 CONCLUSION

Based upon our evaluation of the pertinent information, we have concluded that operation of the Oyster Creek plant with the present core loading at steady-state power levels up to a maximum of 1690 MWT would present no significant hazards considerations not previously evaluated and that there is reasonable assurance that the health and safety of the public will not be endangered.


Donald J. Skovholt
Assistant Director
for Reactor Operations
Division of Reactor Licensing

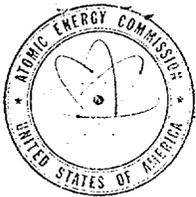


UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

December 7, 1970

TO ALL RECIPIENTS

Please replace the first page of the amendment with the enclosed
for Jersey Central Power & Light Company dated December 2, 1970.



UNITED STATES
ATOMIC ENERGY COMMISSION

WASHINGTON, D.C. 20545

JERSEY CENTRAL POWER & LIGHT COMPANY

DOCKET NO. 50-219

AMENDMENT TO OPERATING LICENSE

Amendment No. 2
License No. DPR-16

The Atomic Energy Commission ("the Commission") has found that:

- a. The application for amendment dated May 5, 1970, and supplements dated June 2, August 31, September 17 and November 18, 1970, comply with the requirements of the Atomic Energy Act of 1954, as amended ("the Act"), and the Commission's regulations set forth in 10 CFR, Chapter I;
- b. 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
- c. Prior public notice of proposed issuance of this amendment is not required since the amendment does not involve significant hazards considerations different from those previously evaluated.

Accordingly, Facility License No. DPR-16 is hereby further amended by restating subparagraphs 3.A. and 3.B.

Section 3.A:

"A. Maximum Power Level

Jersey Central is authorized to operate the facility at steady-state power levels up to a maximum of 1690 megawatts (thermal).

Section 3.B:

"B. Technical Specifications

The Technical Specifications contained in Appendix A, as modified by Attachment A appended hereto (designated as Change No. 5), are hereby incorporated into this license. Jersey Central may operate the facility at