DEC 2 9 1973

Docket No. 50-219

Jersey Central Power & Light Company
ATTN: Mr. I. R. Finfrock, Jr.
Vice President - Generation
Madison Avenue at Punch Bowl Road
Morristown, New Jersey 07960

Change No. 18
License No. DPR-16

Gentlemen:

Your letter dated December 14, 1973, proposed changes to the Technical Specifications of Facility License No. DPR-16 for the Oyster Creek reactor that would increase the maximum average planar linear heat generation rate (MAPLHGR). These changes in the MAPLHGR are the result of changes in the fuel densification model by the General Electric Company as reported in NEDO-20181, "GEGAP III A Model for Prediction of Pellet-Clad Thermal Conductance in BWR Fuel Rods", dated November 1973 and its supplement NEDC-20181 Supplement 1 (Proprietary) dated November 1973 and by EXXON Nuclear as reported in XN-174, "Technical Report on Densification of EXXON Nuclear BWR Fuel", dated November 1973. Modifications to the proposed models were made by the Regulatory staff and transmitted by our letters to you dated December 5 and December 13, 1973, respectively.

The changes in the fuel densification models provide for an exposure dependent gap conductance and time-dependent fuel densification. The Regulatory staff evaluation of these changes is reported in "Supplement 1 to the Technical Report on Densification of General Electric Reactor Fuels" dated December 14, 1973, and "Technical Report on Densification of EXXON Nuclear BWR Fuels, Supplement 1" dated December 17, 1973, and our Safety Evaluations dated December 14, 1973, for the Oyster Creek reactor which were provided to you by our letters of December 14 and December 21, 1973.

DEC 28 1973

Pursuant to an Order dated December 28, 1973, of the Atomic Safety and Licensing Board in the matter of PETITION FOR DERATING OF CERTAIN BOILING WATER REACTORS, the Director of Regulation, in accordance with Section 50.59 of 10 CFR Part 50, has issued Change No. 18 to the Technical Specifications of Facility License No. DPR-16. This change is effective immediately.

Sincerely,

Original signed by
Robert J. Schemel

for Donald J. Skovholt
Assistant Director for
Operating Reactors
Directorate of Licensing

Enclosure:
Change No. 18 to Technical
Specifications

cc w/enclosure:
G. F. Trowbridge, Esquire
Shaw, Pittman, Potts, Trowbridge
and Madden

GPU Service Corporation
ATTN: Mr. Thomas M. Crimmins
Safety & Licensing Manager

Mr. Kenneth B. Walton
Brigantine Tutoring

Miss Dorothy R. Horner
Township Clerk
Township of Ocean

Ocean County Library

Anthony Z. Roisman, Esquire
Berlin, Roisman and Kessler

cc w/enclosure and cy of items
mentioned above except for
proprietary information:*
Mr. Hans L. Hamester
ATTN: Joan Sause
Office of Radiation Programs
Environmental Protection Agency

Mr. Paul Arbesman
Environmental Protection Agency

Distribution	
Docket File	TJCarter, L:OR
AEC PDR	ACRS (16)
Local PDR	RO (3)
RP Reading	OGC
Branch Reding	NDube, L:OPS
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TBAbernathy, DTIE	DLZiemann, L:ORB #2
EGCase, L	JIRiesland, L:ORB #2
RSBoyd, L:RP	RWReid, L:ORB #2
VStello, L:RS	RMDiggs, L:ORB #2
VMoore, L:BWR	SKari, L:RP
DJSkovholt, L:OR	PCollins, L:OLB
	BScharf, DRA (15)
	SVarga, L:RP

*And NEDO-20181 and XN-174.

OFFICE ➤ X7403	L:ORB #2	L:ORB #2	L:ORB #2	L:RS	OGC	L:OR
SURNAME ➤	RWReid:sh	RMDiggs JIRiesland	DLZiemann	VStello		DJSkovholt
DATE ➤	12/28/73	12/28/73	12/28/73	12/ /73	12/28/73	12/29/73

Form AEC-318 (Rev. 9-53) AECM 0240 GPO C43 16 81465-1 520-284

JERSEY CENTRAL POWER & LIGHT COMPANY

LICENSE NO. DPR-16

CHANGE NO. 18 TO TECHNICAL SPECIFICATIONS

DOCKET NO. 50-219

Make the following changes to the specifications:

1. Replace Figure 3.10.1 on page 3.10-4, Change No. 17, with the attached Figure 3.10-1, page 3.10-4, Change No. 18.

2. Replace Bases, pages 3.10-2 and 3.10-3, Changes No. 16 and 17, with the attached pages 3.10-2 and 3.10-3, Change No. 18.

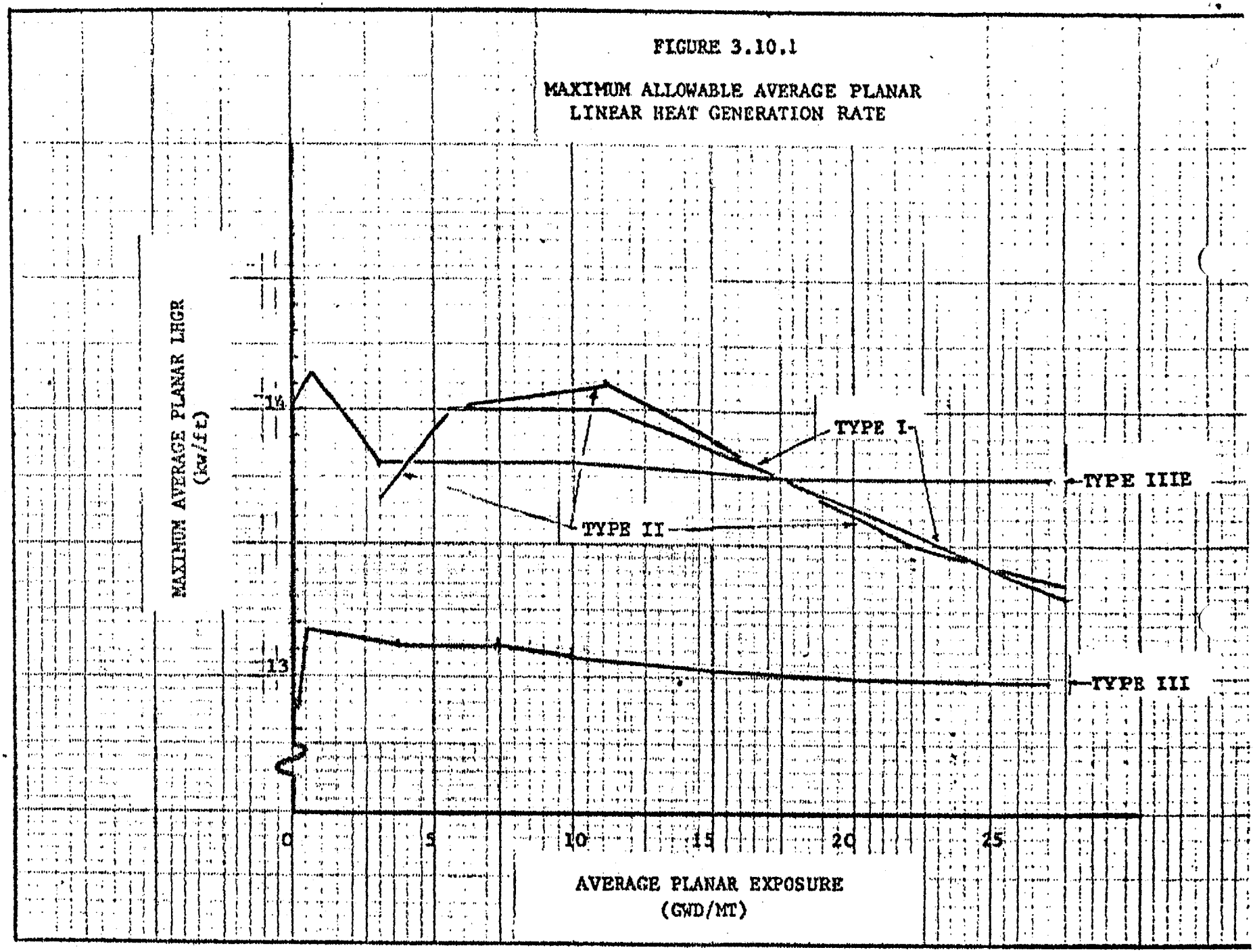
FIGURE 3.10.1
MAXIMUM ALLOWABLE AVERAGE PLANAR LINEAR HEAT GENERATION RATE
MAXIMUM AVERAGE PLANAR LHGR (kw/ft)
15
13
TYPE I
TYPE IIIB
TYPE II
TYPE III
0
5
10
15
20
25
AVERAGE PLANAR EXPOSURE (GWD/MT)

The specification for average planar LHGR assures that the peak cladding temperature following the postulated design basis loss-of-coolant accident will not exceed the 2300°F limit specified in the Interim Acceptance Criteria (IAC) issued in June 1971 considering the postulated effects of fuel pellet densification.

The peak cladding temperature following a postulated loss-of-coolant accident is primarily a function of the average heat generation rate of all the rods of fuel assembly at any axial location and is only dependent secondarily on the rod to rod power distribution within an assembly. Since expected local variations in power distribution within a fuel assembly affect the calculated peak clad temperature by less than ±20°F relative to the peak temperature for a typical fuel design, the limit on the average linear heat generation rate is sufficient to assure that calculated temperatures are below the IAC limit.

The maximum average planar LHGR shown in Figure 3.10.1 for Type I and II fuel is the result of LOCA analyses using values of gap conductance calculated per GEGAP III (G.E. Topical Report, NEDO-20181, "A Model for the Prediction of Pellet Cladding Thermal Conductance in BWR Fuel Rods") with AEC modifications ("Modified G.E. Model for Fuel Densification", December 5, 1973). The Type I curve is the same as the curve labeled "Ω" (Omega) on Figure 5-A of a report attached to a letter dated December 12, 1973, to the AEC from General Electric Company. The Type II curve is the same as the curve labeled "Ω" (Omega) on Figure 6-A of the same report. These calculations were made to determine the effect of densification on PCT following a postulated LOCA and include the results of detailed heatup calculations for the PCT at exposures up to 25,000 MWD/MT.

The maximum average planar LHGR shown in Figure 3.10.1 for Type III and IIIE fuel are the result of calculations presented in Supplement No. 1 to the Exxon Nuclear Company Topical Report, XN-174, "Densification Effects on Nuclear Boiling Water Reactor Fuel", December 1973. These calculations were made to determine the effect of fuel densification on PCT following a postulated LOCA and include the results of detailed heatup calculations for the PCT to maximum planar exposures of 25,000 MWD/MT.

The possible effects of fuel pellet densification were: (1) creep collapse of the cladding due to axial gap formation; (2) increase in the LHGR because of pellet column shortening; (3) power spikes due to axial gap formation; and (4) changes in stored energy due to increased radial gap size.

Calculations show that clad collapse is conservatively predicted not to occur during the current power operation cycle (Cycle 3). Therefore, clad collapse is not considered in the analyses. Since axial thermal expansion of the fuel pellets is greater than axial shrinkage due to densification, the analyses of peak clad temperature do not consider any change in LHGR due to pellet column shortening. Although the formation of axial gaps might produce a local power spike at one location on any one rod in a fuel assembly, the increase in local power density would be on the order of only 2% at the axial midplane. Since small local variations in power distribution have a small effect on peak clad temperature, power spikes were not considered in the analysis of loss-of-coolant accidents.

Changes in gap size affect the peak clad temperature by their effect on pellet clad thermal conductance and fuel pellet stored energy. Treatment of this effect combined with the effects of pellet cracking, relocation and subsequent gap closure are discussed in NEDO-20181 and XN-174.

Pellet-clad thermal conductance for Type I and II fuel was calculated using the GEGAP III model (NEDO-20181) and Pellet-clad thermal conductance for Type III and IIIE fuel was calculated using the GAPEXX model (XN-174).

The specification for local LHGR assures that the linear heat generation rate in any rod is less than the design linear heat generation even if fuel pellet densification is postulated. The power spike penalty specified for Type I and II fuel is based on the analysis presented in Section 3.2.1 of the G.E. Topical Report NEDM-10735 Supplement 6 and in Section I.A of Attachment 1 to Reference 11 for Type III and IIIE fuel, and assumes a linearly increasing variation in axial gaps between core bottom and top, and assures with 95% confidence that no more than one fuel rod exceeds the design linear heat generation rate due to power spiking.