July 27, 2000

Mr. Sander Levin
Acting Site Director
GPU Nuclear, Inc.
Oyster Creek Nuclear Generating Station
P.O. Box 388
Forked River, NJ 08731

SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION - ISSUANCE OF AMENDMENT RE: CONTINUED PLANT OPERATION WITH THREE OUT OF FIVE RECIRCULATION LOOPS (TAC NO. MA6393)

Dear Mr. Levin:

The Commission has issued the enclosed Amendment No. 212 to Facility Operating License No. DPR-16 for the Oyster Creek Nuclear Generating Station, in response to your application dated June 3, 1999, as supplemented on December 22, 1999.

The amendment revises the Technical Specifications to permit continued plant operation with a maximum of two inoperable recirculation loops, provided certain conditions are met.

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

Sincerely,

/RA/

Helen N. Pastis, Sr. Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-219

Enclosures: 1. Amendment No. 212 to DPR-16
2. Safety Evaluation

cc w/encls: See next page

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*SE input dated 3/27/00 was provided and no major changes were made.

OFFICE	PM:PD1-1	E	LA:PD1-1	E	OGC*		RSB*	SC:PDI-1	
NAME	HPastis		SLittle		RHoefling		MRazzaque	M. Gamberoni	
DATE	7/26/00		7/26/00		7/7/00		3/27/00	7/26/00	

OFFICIAL RECORD COPY

GPU NUCLEAR, INC.

AND

JERSEY CENTRAL POWER & LIGHT COMPANY

DOCKET NO. 50-219

OYSTER CREEK NUCLEAR GENERATING STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 212
License No. DPR-16

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

   A. The application for amendment by GPU Nuclear, Inc. et al., (the licensee), dated June 3, 1999, as supplemented on December 22, 1999, 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. DPR-16 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 212, are hereby incorporated in the license. GPU Nuclear, Inc. shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Marsha Gamberoni, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: July 27, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 212

FACILITY OPERATING LICENSE NO. DPR-16

DOCKET NO. 50-219

Replace the following pages of the Appendix A, Technical Specifications, with the attached revised pages as indicated. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove	Insert
1.0-8	1.0-8
3.3-3	3.3-3
3.3-3a	3.3-3a
3.3-4	3.3-4
3.3-5	3.3-5
3.3-6	3.3-6
3.3-7	3.3-7
3.3-8	3.3-8
3.3-8a	3.3-8a
3.10-2	3.10-2
3.10-3	3.10-3
3.10-4	3.10-4

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 212

TO FACILITY OPERATING LICENSE NO. DPR-16

GPU NUCLEAR, INC. AND

JERSEY CENTRAL POWER & LIGHT COMPANY

OYSTER CREEK NUCLEAR GENERATING STATION

DOCKET NO. 50-219

1.0 INTRODUCTION

By letter dated June 3, 1999, as supplemented on December 22, 1999, the GPU Nuclear, Inc. (the licensee) submitted a request for changes to the Oyster Creek Nuclear Generating Station Technical Specifications (TSs). The requested changes would revise the TSs to permit continued plant operation with a maximum of two inoperable recirculation loops, provided certain conditions are met. The December 22, 1999, supplemental letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

Oyster Creek is a General Electric (GE) designed boiling-water reactor/2 plant with five recirculation loops. The purpose of the proposed revisions is to permit plant operation with three operable recirculation loops, provided certain conditions are met.

Nine Mile Point Unit 1 (NMP1), which has a reactor recirculation system with five external loops similar to Oyster Creek, was granted an amendment by the NRC staff allowing three-loop operation on December 12, 1980.

Section 3.3.F.2 of the Oyster Creek TSs permits power operation with four of the five recirculation loops operable, provided certain conditions are met. If only three loops are operable, the TSs require plant shutdown within 12 hours. However, the licensee states that their analysis indicates that the plant may be safely operated at 90 percent power with three operable recirculation loops. The proposed TS revisions will permit continued plant operation with a maximum of two inoperable recirculation loops, provided certain conditions are met.

Under the current TSs, if one loop is inoperable and routine maintenance or other work is required on a second loop, plant shutdown would be required. Such an occurrence, according to the licensee, would challenge the operators and unnecessarily cycle the plant.

Two definitions are added to Section 1 of the TSs to specify the difference between an “idle” recirculation loop and an “isolated” recirculation loop (see Section 3.0 of the safety evaluation for the definition). In addition to the proposed TS revision, several paragraphs have been added to the Bases of Section 3.3, and one paragraph in the Bases of Section 3.10 has been revised.

2.0 EVALUATION

When operating with two inoperable recirculation loops the proposed Section 3.3.F.2.b of the TSs will require that the reactor core thermal power not exceed 90 percent of rated power. This is a physical limitation of the plant because maximum power is about 90 percent of rated power at the maximum recirculation flow with only three recirculation pumps operating. The 90 percent of rated power was used as the maximum power level for a three-loop loss-of-coolant accident (LOCA) analysis. As required by Appendix K, 102 percent of the maximum power for three-loop operation, or 92 percent of rated full power operation, was used by the licensee in their analysis. Therefore, 90 percent of rated power becomes the limiting condition for three-loop operation. The licensee stated in the submittal that the results of their analysis conform to all the requirements of 10 CFR 50.46 and Appendix K, and that the analysis demonstrates that three-loop operation does not require a maximum average planar linear heat generation rate (MAPLHGR) multiplier when both the inoperable loops are idle. The staff issued a request for additional information (RAI) by letter dated December 2, 1999. The licensee provided its response to the RAI by letter dated December 22, 1999. The results of the analysis, and the RAI are discussed below.

The MAPLHGR multiplier specified in the proposed Section 3.3.F.2.a of the TSs is 98 percent of the limits when operating with one isolated recirculation loop. The MAPLHGR multiplier requirement is a result of a reduction in coolant inventory from loop isolation that may lead to earlier core uncovery during a LOCA. Because the proposed change will allow only one isolated loop, the four-loop MAPLHGR multiplier is applicable to three-loop operation.

In the RAI, the staff noted that NMP1, which is the sister plant of Oyster Creek, increased the minimum critical power ratio (MCPR) safety limit by 0.01 for three-loop operation to account for potential increase in flow uncertainty from back flow, uneven flow distribution, etc., during three-loop operation. The staff requested clarification as to why the MCPR safety limit for Oyster Creek should not be increased for three-loop operation. The licensee responded that the NMP1 increase of 0.01 in the MCPR safety limit was due to the potential for increased Traveling In-Core Probe (TIP) noise uncertainty under partial loop operating conditions. Oyster Creek has not used TIPs to directly monitor the core thermal limits parameter since 1983. Oyster Creek uses the Power Shape Monitoring System, developed by the Electric Power Research Institute, that is similar to the GE 3-D Monicore and Sieman’s Power Plex systems. Oyster Creek uses TIP measurements to calibrate the Local Power Range Monitor (LPRMs). The readings from the LPRMs are then used to calculate and to verify predictions made by the Power Shape Monitoring System. If comparisons between predicted and measured TIPs result in a higher uncertainty than used in the development of the MCPR limit, Oyster Creek procedures require a reduction in thermal limits to compensate for increased uncertainty. Furthermore, Oyster Creek three-loop operation will be restricted to 90 percent of rated power, which should compensate for the uncertainties (back flow, uneven flow distributions, etc.) during three-loop operation.

In the RAI, the staff noted that NMP1 has baffle plates in the lower plenum to uniformly distribute the impacting water from recirculation pumps for even distribution of flow during three-loop operation. The staff asked whether Oyster Creek has the same design feature, and the licensee responded that it does.

In the RAI, the staff asked whether there are any cross-connections between the loops in Oyster Creek, and if so, what are the valve positions in those lines during three-loop operation. In response, the licensee stated that there are no cross-connections, and each loop is independent of the other loops. This information assures the staff that there will not be any undesirable interaction among the loop flows during three-loop operation.

With fewer operating loops, each functioning loop will be carrying a higher percentage of the initial core recirculation flow. If a break in one loop occurs, then a faster core flow coastdown will result, which could yield an earlier boiling transition time. For limiting large breaks, this has no impact on the results because no coastdown credit was taken in the analysis. For the smaller breaks (in which there is large margin to 10 CFR 46 limits), the licensee stated that the impact is not significant. In the RAI, the staff asked if this statement was based on actual small-break LOCA calculations for three-loop operation. The licensee's response was that three-loop calculations were performed only for the bounding design-basis accident (DBA) breaks. However, for the four-loop small-break case with the loop isolated, the GE dry-out correlation (no-flow assumption) is used to conservatively bound the effect of faster core flow coastdown. This would be applicable to three-loop operation with only one isolated loop.

Recirculation pump trip transients have been analyzed for single and multiple pump trips. Although the transient in general is very mild, the case of simultaneous trip of all five pumps is considered to be the limiting event among all possible recirculation pump trip events. For three-loop operation, given the requirement that power level be maintained at or below 90 percent of rated power, the transient resulting from the loss of all three pumps would be bounded by the five-pump trip event.

Three-loop operation will result in a reduced flow (less than rated) power operation. An evaluation of the results of an Oyster Creek Extended Load Line Limit Analysis (ELLLA) justifies operation in an extended region on the power/flow map, including reduced flow operation. The ELLLA analysis supports operation below 100 percent power and up to the rod block line on the power/flow map. All normal three-loop operation will occur within this region. In the RAI, the staff requested the licensee to verify whether the normal operating conditions for three-loop operation always occur outside the unstable region of the power/flow map. The licensee responded that this was true. The licensee further stated that the Oyster Creek power-to-flow map has an exclusion zone in which operation is not permitted and procedures are in place that detail actions to be taken if the exclusion zone is inadvertently entered. Normal three-loop operation is outside of the exclusion zone and the procedures for inadvertent entry would apply to three-loop operation as they would to four- and five-loop operation.

As discussed above, the staff has determined that the safety evaluation justifying plant operation with three-operable recirculation loops was performed using previously-approved methods, the results meet the appropriate licensing criteria, and they are therefore, acceptable.

3.0 TECHNICAL SPECIFICATIONS REVISIONS

Two definitions are added to Section 1 of the TSs to specify the difference between an “idle” recirculation loop and an “isolated” recirculation loop. A recirculation loop is idle when its discharge valve is in the closed position and its discharge bypass valve and suction valve are in the open position. And, a recirculation loop is isolated when the suction valve, discharge valve and discharge bypass valve are in the closed position. These definitions have been incorporated into the TSs to provide an explicit description of acceptable valve configuration.

Section 3.3.F.2

Power operation with a maximum of two-idle recirculation loops or one-idle recirculation loop and one isolated recirculation loop is permitted. The reactor shall not operate with two isolated recirculation loops.

a. With one isolated loop the following conditions shall be met:

    1. The Average Planar Linear Heat Generation Rate (APLHGR) as a function of average planar exposure, at any axial location shall not exceed 98 percent of the limits specified in 3.10.A. The action to bring the core to 98 percent of the APLHGR limits shall be completed prior to isolating the recirculation loop.

    2. The circuit breaker of the recirculation pump motor generator set associated with an isolated recirculation loop shall be open and defeated from operation.

    3. An isolated recirculation loop shall not be returned to services unless the reactor is in the cold shutdown condition.

b. When there are two inoperable recirculation loops (either two idle recirculation loops or one idle recirculation loop and one isolated recirculation loop) the reactor core thermal power shall not exceed 90 percent of rated power.

These changes reflect the assumptions used in the safety analyses described above, and are therefore acceptable.

Bases Sections 3.3 and 3.10

The revisions properly reflect the affected changes, and hence, the changes are acceptable. In each case the Bases section has been segmented from the specification, which affects the pagination of the Bases. Therefore, the staff concludes that the proposed revisions to the TSs to permit plant operation with three operable recirculation loops is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New Jersey State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (65 FR 25766). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: M. Razzaque

Date: July 27, 2000

Oyster Creek Nuclear Generating Station
GPU Nuclear, Inc.

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