



GPU Nuclear, Inc.  
U.S. Route #9 South  
Post Office Box 388  
Forked River, NJ 08731-0388  
Tel 609-971-4000

6730-97-2166

June 10, 1997

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

Dear Sir:

Subject: Oyster Creek Nuclear Generating Station (OCNGS)  
Facility License No. DPR-16  
Docket No. 50-219  
Supplement to Technical Specification Change Request No. 250

- References:
- (1) GPU Nuclear letter No. 6730-96-2299, Michael B. Roche to USNRC dated October 4, 1996.
  - (2) NEDC-32505P, R-Factor Calculation Method for GE11, GE12 and GE13 Fuel, November 1995.
  - (3) Licensing Topical Report, General Electric BWR Thermal Analysis Basis (GETAB): Data, Correlation and Design Application, NEDO-10958-A, January 1977.
  - (4) General Electric Nuclear Energy Document NEDE-24011-P-A-11, General Electric Standard Application for Reactor Fuel (GESTAR II), dated November 1995.

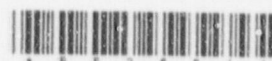
GPU Nuclear requested a license amendment in Reference 1. The amendment would revise the Safety Limit Minimum Critical Power Ratio (SLMCPR) and the operating CPR limit. The new SLMCPR results from a General Electric (GE) analysis for the Cycle 16 OCNGS core. The current SLMCPR remains valid through mid-cycle. GPU Nuclear requested approval of the revised limits by August 15, 1997.

Attachment 1 supplements Reference 1. This supplement is submitted in response to a verbal request for additional information from the NRC staff. Attachment 1 contains information considered proprietary to GE as described in 10 CFR 2.790(a)(4). Brackets in the right hand margin indicate the general location of proprietary information. Brackets within areas of text

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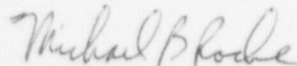
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specify proprietary information. Attachment 2 contains an affidavit from GE attesting to the proprietary nature of the information. Therefore, it is requested that this information be withheld from public disclosure. Attachment 3 is a redacted version of Attachment 1 that can be disclosed publicly.

The information contained in this supplement does not change the proposed SLMCPR or operating CPR values nor does it change the safety assessment or finding of no significant hazards considerations GPU Nuclear provided in Reference 1.

Should further information be required, please contact Mr. Paul Czaya of our Regulatory Affairs Department at 609-971-4139.

Very truly yours,



Michael B. Roche  
Vice President and Director  
Oyster Creek

Attachments

c: Administrator, USNRC Region I  
USNRC Resident Inspector  
Oyster Creek USNRC Project Manager

**Attachment 2**  
**General Electric Affidavit**





## Affidavit

**I, Ralph J. Reda**, being duly sworn, depose and state as follows:

- (1) I am Manager, Fuels and Facility Licensing, General Electric Company ("GE") and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.
- (2) The information sought to be withheld is contained in Attachment 1 to letter number 6730-97-2166, *Technical Specification Change Request No. 250 Supplement*. The proprietary text has identifying brackets in the right hand margin.
- (3) In making this application for withholding of proprietary information of which it is the owner, GE relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4) and 2.790(a)(4) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information," and some portions also qualify under the narrower definition of "trade secret," within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).
- (4) Some examples of categories of information which fit into the definition of proprietary information are:
  - a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;
  - b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;
  - c. Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of General Electric, its customers, or its suppliers;
  - d. Information which reveals aspects of past, present, or future General Electric customer-funded development plans and programs, of potential commercial value to General Electric;

- e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in both paragraphs (4)a. and (4)b., above.

- (5) The information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GE, and is in fact so held. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in (6) and (7) following. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GE, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence.
- (6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within GE is limited on a "need to know" basis.
- (7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GE are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.
- (8) The information identified in paragraph (2) is classified as proprietary because it contains details of GE's Safety Limit MCPR analysis and the corresponding results which GE has applied to Oyster Creek's actual core design with GE's fuel.

The development of the methods used in these analysis, along with the testing, development and approval of the supporting critical power correlation was achieved at a significant cost, on the order of several million dollars, to GE.

- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GE's competitive position and foreclose or reduce the availability of profit-making opportunities. The fuel design is part of GE's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical, and NRC review costs comprise a substantial investment of time and money by GE.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

**Affidavit**

GE's competitive advantage will be lost if its competitors are able to use the results of the GE experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GE would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GE of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools.

State of North Carolina )  
County of New Hanover ) SS:

Ralph J. Reda, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated therein are true and correct to the best of his knowledge, information, and belief.

Executed at Wilmington, North Carolina, this 29<sup>th</sup> day of May, 19 97



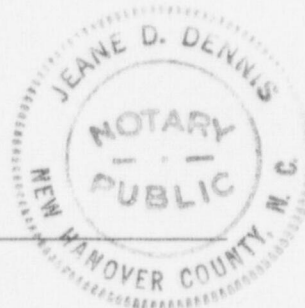
Ralph J. Reda  
General Electric Company

Subscribed and sworn before me this 29<sup>th</sup> day of May, 19 97



Notary Public, State of North Carolina

My Commission Expires 7-24-01





### Attachment 3

#### Technical Specification Change Request No. 250 Supplement Non-Proprietary Version

##### Control Rod Pattern Development for the Oyster Creek Cycle 16 SLMCPR Analysis

Projected control blade patterns for the rodged burn through the cycle were used to deplete the core to the cycle exposures to be analyzed. At the desired cycle exposures, the bundle exposure distributions and their associated R-factors, determined in accordance with Reference 2, were utilized for the SLMCPR cases to be analyzed. The use of different rod patterns to achieve the desired cycle exposure has been shown to have a negligible impact on the actual calculated SLMCPR. An estimated SLMCPR was obtained for an exposure point at the beginning of cycle (BOC), middle of cycle (MOC) and end of cycle (EOC) in order to establish which exposure point(s) would produce the highest (most conservative) calculated SLMCPR.

For each cycle exposure point of interest, the SLMCPR is analyzed with radial power distributions that maximize the number of bundles at or near the operating limit CPR during rated power operation. This approach satisfies the stipulation in Reference 3 that the number of rods susceptible to boiling transition be maximized. GE has established criteria to determine if the control rod patterns and resulting radial power distributions are acceptable. These criteria were discussed with the NRC inspection team during the May 6-10, 1996 inspection and have since been incorporated into the GE technical design procedures. These criteria include no gross violations of Technical Specification operating limits (e.g., MCPR, Maximum Average Planar Linear Heat Generation Rate, Linear Heat Generation Rate), criticality (calculated, normalized  $k_{eff}$  near 1) and total number of bundles within [GE PROPRIETARY INFORMATION REMOVED] of the MCPR of the core. Different rod patterns were analyzed until the criteria on the above parameters were met. The rod pattern search was narrowed by starting from a defined set of patterns known from prior experience to yield the flattest possible MCPR distributions. This was done for all three cycle exposures, BOC, MOC and EOC. A Monte Carlo analysis was then performed for BOC, MOC peak hot excess point and the EOC-2000 MWD/MTU exposure point to establish the maximum SLMCPR for the cycle.

##### Comparison of Oyster Creek Cycle 16 SLMCPR versus the Generic GE9B Value

Table 1 summarizes the relevant input parameters and results of the SLMCPR determination for both the generic GE8X8NB and the Oyster Creek Cycle 16 core.

GESTAR II (Reference 4) specifies that the SLMCPR analysis for a new fuel design shall be performed for a large high power density plant assuming a bounding equilibrium core. The GE9B product line generic SLMCPR (1.06) was determined according to this specification.

The Oyster Creek Cycle 16 core is not an equilibrium core, although it consists of all GE 8X8 fuel designs. The Cycle 16 core contains 348 GE9B (GE8X8NB) and 212 GE8B (GE8X8EB) fuel bundles. The limiting fuel bundles for MCPR are the GE9B fuel designs. The SLMCPR for the generic analysis occurs at peak hot excess reactivity (4.4 GWD/MT). The OCNGS core SLMCPR occurs at EOC-2000 GWD/MT. This difference is attributable to core design and fuel bundle design differences between OCNGS and the generic analysis. The lower peak bundle power for the OCNGS analysis is due to the higher operating CPR limit (1.53) for OCNGS than used in the generic value (1.30). This does not impact the calculation of the SLMCPR.

In general, the calculated safety limit is dominated by two key parameters: (1) flatness of the core bundle-by-bundle MCPR distributions and (2) flatness of the bundle pin-by-pin power/R-factor distributions. The OCNGS Cycle 16 analysis produces both a flatter bundle-by-bundle and pin-by-pin power distributions. In Table 1, the number of bundles that are within [GE PROPRIETARY INFORMATION REMOVED]  $\Delta$ CPR is greater for the OCNGS Cycle 16 analysis than the generic analysis. The more bundles closer to limits yields more rods susceptible to boiling transition and a higher SLMCPR.

The OCNGS analysis has a pin-by-pin distribution that is flatter than the generic analysis because the generic analysis includes a number of controlled bundles that are within [GE PROPRIETARY INFORMATION REMOVED] of MCPR while the OCNGS analysis does not include any controlled bundles within [GE PROPRIETARY INFORMATION REMOVED]. The R-factor distribution for controlled fuel bundles is more peaked than the uncontrolled R-factor distribution. By having all uncontrolled fuel bundles within [GE PROPRIETARY INFORMATION REMOVED] of the limiting MCPR, the OCNGS analysis will have a flatter pin-by-pin distribution. This will also yield more rods susceptible to boiling transition and a higher SLMCPR.

Therefore, the OCNGS Cycle 16 analysis provides a more conservative (flatter) power distribution than the generic analysis and the higher SLMCPR for OCNGS Cycle 16 analysis than the generic analysis (1.09 vs. 1.06) is reasonable. The Oyster Creek Cycle 16 SLMCPR of 1.09, based on approved GE methodology, provides a suitably conservative limit.



Table 1

Comparison of Generic GE9B and Oyster Creek Cycle 16 Cores.

Quantity, description	GE9B Generic	Oyster Creek Cycle 16
Number of Bundles in Core	764	560

GE PROPRIETARY INFORMATION REMOVED