

JPP

Public Service  
Electric and Gas  
Company

E. C. Simpson

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Senior Vice President - Nuclear Engineering

**AUG 26 1997**

LR-N97528

LCR H97-05

United States Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

REQUEST FOR CHANGE TO TECHNICAL SPECIFICATIONS (SUPPLEMENT)  
SAFETY LIMIT MINIMUM CRITICAL POWER RATIO (SLMCPR)  
HOPE CREEK GENERATING STATION  
FACILITY OPERATING LICENSE NPF-57  
DOCKET NO. 50-354

Gentlemen:

On March 31, 1997, Public Service Electric & Gas (PSE&G) Company transmitted, via letter LR-N97187, a proposed change to the Hope Creek Technical Specifications (TS). The proposed changes revised TS 2.1.2, "THERMAL POWER, High Pressure and High Flow", ACTION a.1.c for LCO 3.4.1.1, "Recirculation Loops" and the Bases for TS 2.1, "Safety Limits". The changes contained in that request implemented an appropriately conservative Safety Limit Minimum Critical Power Ratio (SLMCPR) for Hope Creek's Cycle 7 (current cycle) core and fuel designs. Justification for those proposed changes was developed from General Electric SLMCPR analyses performed to address SLMCPR issues identified in a 10CFR21 notification made by General Electric on May 24, 1996.

On July 16, 1997, PSE&G supplemented the March 31, 1997, submittal to provide revised SLMCPR values for the upcoming operating cycle (Cycle 8). As a result of NRC questions received concerning the differences between the Cycle 7 and Cycle 8 SLMCPR values, PSE&G is providing additional information contained in Attachment 1 of this letter. PSE&G has determined that the information contained in this letter does not alter the conclusions reached in the 10CFR50.92 No Significant Hazards analysis previously submitted with LCR H97-05 in the July 16, 1997 letter. In accordance with 10CFR50.91(b)(1), a copy of this submittal has been sent to the State of New Jersey.

Attachment 2 of this letter provides revised Technical Specification Bases pages associated with Hope Creek Technical Specification Amendment No. 101, issued on July 24, 1997. The Bases pages revised by Amendment No. 101 impacted the same section as Technical Specification Amendment No. 100, also issued on July 24, 1997. Therefore, the Bases pages for Amendment No.

THE INFORMATION CONTAINED IN ATTACHMENT 1 OF THIS LETTER IS PROPRIETARY  
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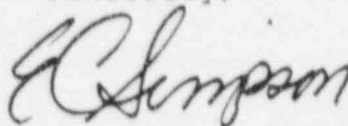
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101 are being revised to reflect the changes already approved through the issuance of Amendment No. 100.

Should you have any questions regarding this request, we will be pleased to discuss them with you.

Sincerely,



Affidavit  
Attachments (2)

C Mr. H. Miller, Administrator - Region I  
U. S. Nuclear Regulatory Commission  
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King of Prussia, PA 19406

Mr. D. Jaffe, Licensing Project Manager - HC  
U. S. Nuclear Regulatory Commission  
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Mr. S. Morris (X24)  
USNRC Senior Resident Inspector - HC

Mr. K. Tosch, Manager IV  
Bureau of Nuclear Engineering  
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BC Senior Vice President - Nuclear Engineering (N19)  
General Manager - Hope Creek Operations (H07)  
Director - QA/NSR (X01)  
Director - Licensing/Regulation and Fuels (N21)  
Manager - Business Planning & Co-Owner Affairs (N18)  
Manager - Hope Creek Operations (H01)  
Manager - System Engineering - Hope Creek (H18)  
Manager - Nuclear Review Board (N38)  
Manager - Hope Creek Licensing (N21)  
Supervisor - Hope Creek Fuels (N20)  
J. J. Keenan, Esq. (N21)  
Records Management (N21)  
Microfilm Copy  
Files Nos. 1.2.1 (Hope Creek), 2.3 (LCR H97-05)

STATE OF NEW JERSEY )  
                              ) SS.  
COUNTY OF SALEM        )

E. C. Simpson, being duly sworn according to law deposes and says:

I am Senior Vice President - Nuclear Engineering of Public Service Electric and Gas Company, and as such, I find the matters set forth in the above referenced letter, concerning Hope Creek Generating Station, Unit 1, are true to the best of my knowledge, information and belief.

EC Simpson

Subscribed and Sworn to before me  
this 26 day of August, 1997

Elizabeth J. Kidd  
Notary Public of New Jersey

ELIZABETH J. KIDD  
NOTARY PUBLIC OF NEW JERSEY  
My Commission Expires April 25, 2000

My Commission expires on \_\_\_\_\_

HOPE CREEK GENERATING STATION  
FACILITY OPERATING LICENSE NPF-57  
DOCKET NO. 50-354  
SAFETY LIMIT MINIMUM CRITICAL POWER RATIO (SLMCPR) CHANGES

ADDITIONAL INFORMATION CONCERNING HOPE CREEK CYCLE 7 AND CYCLE 8  
SLMCPR LIMITS:

The Hope Creek Cycle 7 and Cycle 8 cores are both 100% comprised of the GE9B thermal-mechanical fuel design. Both cycles have similar core enrichments of 3.25% and 3.23% and similar reload batch fractions of 30.4% and 30.9% respectively.

Since the absolute value of the SLMCPR is significantly driven by the uncertainty in core and bundle power peaking distributions, core average parameters do not provide adequate insight to gauge the impact on SLMCPR. A closer look at the factors which influence the localized bundle pin peaking and core radial peaking factors will reveal the driving forces behind the SLMCPR differences.

The following bundle types are currently loaded into Hope Creek Cycle 7:

Number	Bundle Description	Cycle First Loaded
52	GE9B-P8CWB325-11GZ2-80M-150-T	4
184	GE9B-P8CWB325-11GZ2-80M-150-T	5
64	GE9B-P8CWB325-11GZ1-80M-150-T	5
144	GE9B-P8CWB324-9GZ1-80M-150-T	6
88	GE9B-P8CWB325-11GZ1-80M-150-T	6
144	GE9B-P8CWB324-9GZ1-80M-150-T	7
88	GE9B-P8CWB325-11GZ1-80M-150-T	7

The following bundle types are currently loaded into Hope Creek Cycle 8:

Number	Bundle Description	Cycle First Loaded
56	GE9B-P8CWB325-11GZ2-80M-150-T	5
8	GE9B-P8CWB325-11GZ1-80M-150-T	5
144	GE9B-P8CWB324-9GZ1-80M-150-T	6
88	GE9B-P8CWB325-11GZ1-80M-150-T	6
144	GE9B-P8CWB324-9GZ1-80M-150-T	7
88	GE9B-P8CWB325-11GZ1-80M-150-T	7
176	GE9B-P8CWB327-8GZ1-80U-150-T	8
60	GE9B-P8CWB298-8GZ-80U-150-T	8

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Although these fuel bundles are all of the GE9B thermal-mechanical design, they differ in their nuclear characteristics. Pin-by-pin enrichment loading, gadolinia burnable poison loading, as well as axial zoning of the enrichments and burnable poisons give rise to differing pin peaking distribution behaviors. The fact that only approximately one third of the core is loaded with fresh fuel each cycle (a bundle is expected to be resident in the core for at least three cycles) means that different regions of fuel will achieve their different peaking characteristics at different times during their individual lifetimes. A once burnt region of fuel can be reaching its peak reactivity at the same time that a similarly designed twice burned region of fuel will be reaching its minimum.

These differing nuclear characteristics provide a spectrum of peaking distributions, which are not necessarily repeatable from once cycle to another. Inspection of the tables above will show that Cycle 8 is only now discharging fuel originally loaded in Cycle 4. The influence of these Cycle 4 bundles had on the Cycle 7 peaking distributions will no longer be experienced in Cycle 8.

Closer inspection of some of the differences between the GE generic GE9 SLMCPR evaluation and the Hope Creek specific evaluations for Cycles 7 and 8 confirms these effects:

Parameter	Generic GE9	Hope Creek Cycle 7	Hope Creek Cycle 8
Limiting Exposure			
SLMCPR	1.07	1.08	1.10

The three evaluations were limiting at different cycle exposures.

Both Cycles 7 and 8 have fuel bundle pin peaking distributions which give rise to less limiting. The radial peaking distributions of the three evaluations are quite different, though. The and maximum radial peaking factors (RPFs) reveal that Cycle 7 has a MCPR distribution similar to that of the Generic GE9, but Cycle 8 shows a much more pronounced effect on the SLMCPR due to its initial MCPR distribution. A

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larger percentage of the bundles in the Cycle 8 core are near the limiting MCPR (i.e., a much flatter MCPR distribution). The importance of the flatter MCPR distribution in Cycle 8 is the increase in critical power ratio (CPR) uncertainty, and its subsequent increase in SLMCPR.