

SIEMENS

June 3, 1997
LJM:97:056

U.S. Nuclear Regulatory Commission, Region IV
Attn: E.W. Merschoff, Administrator
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

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NRC
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Dear Mr. Merschoff:

Subject: 30-Day Followup Report on Part 21 - Reportable Defect

On May 22, 1997, Siemens Power Corporation (SPC) notified the NRC (HQ Operations Center and Region IV) of a 10CFR Part 21 - reportable defect relative to the uncertainties for additive constants used in SPC's ANFB critical heat flux correlation for the ATRIUM™-9 fuel design and other 9x9 fuel designs with internal water channels. Attached please find a copy of our 30-day written followup report required under 10CFR 21.21(d)(3)(ii) which is being provided to you per 10CFR 21.5. If you have questions, please feel free to contact me on 509-375-8537.

Very truly yours,

Loren Maas

L. J. Maas, Manager
Regulatory Compliance

/pg

Enclosures

cc: C. Hooker - Region IV, WCFO

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Siemens Power Corporation

Nuclear Division
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May 22, 1997

HDC:97:046

Document Control Desk
ATTN: Chief, Planning, Program and Management Support Branch
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

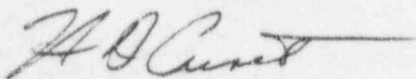
10 CFR 21 Evaluation and Notification of Adequacy of ATRIUM™-9 CHF Data Base

This letter is written notification of a reportable defect per 10 CFR Part 21 reported to the NRC Operations Center by facsimile on May 22, 1997.

During NRC Engineering Inspection 9990081/97-01, the NRC determined that the critical heat flux (CHF) data base for the ATRIUM™-9* fuel design and other 9x9 fuel designs with internal water channels was not extensive enough to adequately estimate the uncertainties for the additive constants used in SPC's ANFB CHF correlation. A statistical treatment of the existing relevant CHF data was developed by SPC to estimate the uncertainties beyond the original CHF data ranges. These estimated uncertainties are larger than the original additive constant uncertainties. Revised safety limit calculations with the larger additive constant uncertainties indicate that certain plants may have operated with nonconservative safety limits. Based on these calculations and a Part 21 evaluation, SPC has concluded the above described situation represents a defect as defined in 10 CFR 21.3, "A condition...that could contribute to the exceeding of a safety limit..."

The affected BWR utilities have been kept informed, and the actions taken and to be taken to address the issue are provided in the Attachment.

Very truly yours,



H. Donald Curet, Manager
Product Licensing

/smg

Attachment

cc: E. Y. Wang (NRR/DRPM/PECB)

* ATRIUM is a trademark of Siemens.

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Attachment

REPORTABLE DEFECT

- (i.) *Name and address of the individual informing the Commission.*

H. D. Curet, Manager, Product Licensing, Siemens Power Corporation, 2101 Horn Rapids Road, Richland, WA 99352.

- (ii.) *Identification of the facility, the activity, or the basic component supplied for such facility or such activity within the United States which fails to comply or contains a defect.*

The NRC determined the number of test points and the range of conditions for critical heat flux experiments for the SPC ATRIUM™-9* fuel design and other 9x9 fuel designs with an internal water channel are insufficient to justify the uncertainty values for the additive constants used in the safety limit determination. The uncertainty in the additive constant for these fuel designs may be larger than previously estimated. A larger uncertainty value may affect the safety limit for BWRs containing reload quantities of SPC 9x9 fuel designs with internal water channels.

- (iii.) *Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect.*

Siemens Power Corporation, Richland, WA.

- (iv.) *Nature of the defect or failure to comply and the safety hazard which is created or could be created by such a defect or failure to comply.*

Statistically estimated additive constant uncertainties, in lieu of uncertainties quantifiable with CHF data, are larger than previously estimated for SPC 9x9 fuel designs with internal water channels. These increased additive constant uncertainties have resulted in the increase in the safety limits for some licensees with SPC 9x9 fuel designs with internal water channels.

- (v.) *The date on which the information of such defect or failure to comply was obtained.*

During NRC Engineering Inspection 9990081/97-01, the NRC informed SPC the number of test points and the range of conditions for critical heat flux experiments for SPC 9x9 fuel designs with an internal water channel are insufficient to justify the uncertainty values for the additive constants used in the safety limit determination. The magnitude of an estimated additive constant uncertainty was

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determined statistically April 17, 1997 using the methodology submitted to the NRC and documented in ANF-1125, Supplement 1, Appendix D, "ANFB Critical Power Correlation Uncertainty for Limited Data Sets," April 1997. Due to the increase in the estimated value of the uncertainty and its probable impact on calculated safety limits, a Part 21 evaluation was initiated to determine if a safety hazard existed or could be created.

- (vi.) *In the case of a basic component which fails to comply, the number and the location of all such components in use at, supplied for, or being supplied for one or more facilities or activities subject to the regulations in this part.*

Safety limit calculations for current reactors (Quad Cities Unit 2, Cycle 15; LaSalle Unit 2, Cycle 8 and Dresden Unit 3, Cycle 15) that have received but have not yet operated with SPC ATRIUM-9 fuel design were performed using the increased additive constant uncertainty. The safety limit for Quad Cities increased 0.01. The safety limits for LaSalle and Dresden were unaffected.

The safety limit previously calculated by SPC for WNP-2, Cycle 11, which has been completed and included all SPC fuel, was nonconservative in comparison to the safety limit calculated using the increased additive constant uncertainties. Safety limit calculations for fuel cycles subsequent to WNP-2, Cycle 11 were not the responsibility of SPC.

- (vii.) *The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.*

All affected licensees have been informed of the additive constant uncertainty issue. SPC has submitted to the NRC a statistical methodology (see item v. above) to estimate the additive constant uncertainty. Until the NRC approves this methodology, the statistically estimated increase in the uncertainty is multiplied by two and added to the original additive constant uncertainty. The larger uncertainty (i.e., increase multiplied by 2) is to be used in future safety limit calculations until the NRC approves the uncertainty increase estimated by the submitted statistical methodology or new CHF data are obtained to quantify a new additive constant uncertainty.

- (viii.) *Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.*

In addition to providing revised safety limit calculations where appropriate, SPC has advised its customers that it intends to obtain additional CHF data to quantify the additive constant uncertainty. If the new uncertainty is comparable to the original uncertainty or the increase in the new uncertainty is less than the presently estimated uncertainty increase obtained by the statistical methodology, safety limits may be reduced. Interactions with the NRC will be required to obtain approval for the use of a new or reduced additive constant uncertainty.