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BUTLER,W.R. Project Directorate I-2

SUBJECT: Establishes higher priority for NRC to review licensee qualifications to perform reload design & licensing analyses & two pending topical repts in order to support startup for Cycle 5,per 901213 meeting.

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DEC 20 1990

Director of Nuclear Reactor Regulation
Attention: Dr. W.R. Butler, Project Director
Project Directorate I-2
Division of Reactor Projects
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
PROPOSED AMENDMENT 87 TO LICENSE NO. NPF-22:
UNIT 2 CYCLE 5 RELOAD
PLA-3496 FILES A7-8C/A17-2/R41-2

Reference: *PLA-3445, H.W. Keiser to W.R. Butler, "Proposed Amendment 87 to License No. NPF-22: Unit 2 Cycle 5 Reload", dated September 24, 1990.*

Dear Dr. Butler:

As you are aware, PP&L met with the NRC on December 13 to discuss our qualifications to perform reload design and licensing analyses and to provide an overview of the two pending topical reports (transient analysis methods and applications) upon which our Unit 2 Cycle 5 (U2C5) reload licensing submittal is based. The position taken by the NRC during that meeting was that, due to a new Statistical Combination of Uncertainties (SCU) approach described in our Applications topical report, coupled with the low NRC priority of reviewing such reports, the staff would not be able to complete the review in time to support startup of U2C5. No technical impasses with the SCU approach were conveyed to PP&L.

In response to this position, PP&L stated that we would prepare a submittal that would attempt to establish a higher priority for this review. This letter serves to meet that commitment.

Our core physics topical report was submitted in 1987, received subsequent NRC approval in 1988, and has been used by PP&L to design our reloads since that time (with our fuel vendor performing the required transient analyses). In January of 1990, we submitted our RETRAN (transient analysis model validation) topical report and followed that in August with our applications topical report. On September 24, 1990, we provided our Susquehanna Unit 2 Cycle 5

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Reload Licensing submittal (including requested technical specification changes) for your review. Submittal of these documents was intended to comply with the NRC's established guideline that at least six months is needed when a license amendment involving unreviewed methods is required to restart the unit (per Generic Letter 84-20). PP&L needs to receive approval of our proposed U2C5 license amendment by May 3, 1991 to support startup. Earlier this year, the staff explained that budgeting constraints had adversely affected their capability to make arrangements to contract for this review, but PP&L was provided a commitment in July that the review could indeed be accomplished in support of U2C5. Unfortunately, the staff has since indicated that the resource impact of NRC's review of our aforementioned SCU approach was not recognized until just before our December 13 meeting, and based on this, they could not assure a review on our requested schedule.

Based on the above, it is clear that it is PP&L's method of statistically treating uncertainties in the determination of MCPR operating limits that is the staff's primary concern with regard to completing its review. The traditional approach has been to calculate limiting event ΔCPRs and add them to a vendor derived safety limit MCPR value. PP&L's approach is to statistically combine the uncertainties inherent in both the ΔCPR and the traditional safety limit calculations to directly calculate the MCPR operating limit. This approach is only used for certain key events. All other events are treated in the traditional manner. In both approaches, the goal is to demonstrate that for any Anticipated Operational Occurrence (AOO), at least 99.9% of the fuel rods would not be expected to experience boiling transition. This Specified Acceptable Fuel Design Limit (SAFDL) is presented in the SSES FSAR Section 4.4.1.4, the Standard Review Plan Section 4.4, and the proposed Technical Specifications, and the method proposed by PP&L rigorously adheres to it. We contend that the use of a MCPR value as the "safety limit" is a calculational convenience to demonstrate compliance with the SAFDL. We also believe that this method for directly calculating MCPR operating limits does not in any way compromise that important safety requirement.

Why has PP&L chosen this approach - called the Statistical Combination of Uncertainties (SCU) method - when our vendor, and others, use the safety limit/ΔCPR approach? Our more rigorous treatment of uncertainties (a more conservative treatment than has been previously approved by the NRC) would result in an increase in MCPR operating limit and corresponding decrease in operating margin if the traditional approach were used. We believe that by having

a more realistic (statistical) treatment of certain key parameters (e.g., control blade scram speed), we can "reclaim" that margin by means of a consistent and conservative analysis approach. PP&L believes that the depth of our understanding of this complex analysis area, as demonstrated by the advanced Statistical Combination of Uncertainties (SCU) methodology, deserves positive recognition and support by the NRC.

As far as the results of applying PP&L's well documented and validated approach in our U2C5 licensing submittal, the calculated technical specification MCPR operating limits are very similar to those calculated by our fuel vendor (ANF) using their NRC approved safety limit/ΔCPR approach. The following table illustrates this:

Table 1

Comparison of PP&L and ANF
Generated MCPR Operating Limits
Susquehanna Steam Electric Station
Unit 2 Cycle 5

Event	PP&L	ANF
GLRWOB	1.32	1.32
FWCF @ 100/100	1.31	1.26
RWE	1.27	1.28

We also compared operating limits for U2C2 as part of our methods validation process; Table 2 illustrates those results:

Table 2

Comparison of PP&L and ANF
Generated MCPR Operating Limits
Susquehanna Steam Electric Station
Unit 2 Cycle 2

	PP&L	ANF
GLRWOB	1.30	1.30
FWCF @ 100/100	1.26	1.30*
RWE	1.26	1.27

* The U2C2 ANF FWCF analysis used on a model of the turbine bypass system which excluded the fast opening feature of the SSES turbine bypass system. This produced extremely conservative MCPR operating limits for the FWCF. Based on U2C5 analyses, in which ANF properly modelled the fast opening feature of the turbine bypass system, the U2C2 ANF MCPR operating limit would have been approximately 1.24 with the fast opening feature modelled.

As shown in both tables, our results compare very closely to those calculated by the vendor. The PP&L approach, therefore, represents no sacrifice of safety margins, nor does it create a larger operating envelope. Rather, it is a conservative, knowledgeable, and consistent application of accepted physics and analysis principles, albeit in a somewhat different approach than used by others, which produces a similar set of safe operating limits. For both U2C5 and U2C2, ANF used their NRC approved methodology to demonstrate that operating above a MCPR value of 1.06 will indeed ensure that at least 99.9% of the fuel rods in the core are not expected to experience boiling transition.

PP&L believes that our new approach should be evaluated on its merits, without being delayed simply because it is innovative. We have expended over thirty man years in developing our transient analysis capability and in validating both our methods and our ability to use them responsibly consistent with the health and safety interests of our public. We have willingly made a large investment which we believe is merited by the importance of the reload licensing task. However, we believe our customers are now entitled to reap a return on that lengthy and costly investment in the form of reduced nuclear fuel costs - both directly and indirectly. Directly, there is a substantial reduction in our net cost for each reload with PP&L doing the design and licensing analysis - approximately $500,000 per reload. Indirectly, we believe that in doing our own design and licensing, improved fuel cycles can be developed which fully utilize our fuel consistent with the vendors approved mechanical design limits. Better fuel utilization can reduce the amount of spent fuel generated, and our involvement in the design and licensing of our reloads lends insight and direct experience to the important role of operations support. In these days of competing energy sources, PP&L, as a responsible steward of its customers' resources, has an obligation to pass on to its customers any savings which can be responsibly achieved. Certainly, based on the reputation, competence, experience, and capability of our fuel design and analysis people, the design and licensing of reloads to achieve such a savings is consistent with that obligation.

Based on the discussion provided above, PP&L hereby requests that the NRC establish a priority that will ensure that the reviews can be completed in time to approve the reload license submittal currently before it.

One other concern raised at the December 13 meeting had to do with the potential that the PP&L SCU method has to be reviewed by CRGR, since it represents a "generic" change to the traditional means of defining the MCPR safety limit. PP&L does not agree with that position. PP&L is not a fuel vendor, and the application is limited to Susquehanna reloads only. PP&L's licensing methods are backed by extensive supporting evidence of the validity of our approach in the case of the Susquehanna units. Whether or not some other vendor or utility could or would undertake such a validation effort we do not know. If they do not, then the point is moot. If they do, and can demonstrate technically that a SCU approach to uncertainty treatment complies with the criterion for ensuring fuel integrity, then that application would also be judged on its own merits.

In summary, PP&L has undertaken an extensive and costly program, covering many years, to develop the means and expertise to design and license its own reloads. Throughout our methods development program, our approach has been to insist on defensible physical models, to obtain a complete understanding of the phenomenological and analytical aspects of Anticipated Operational Occurrences, and to develop conservative applications of engineering practices and principles to ensure that the health and safety of the public is protected. We believe we are entitled to recover that investment on behalf of our customer, and urge your positive consideration of our position. I would appreciate a reply at your earliest convenience.

Very truly yours,

H. W. Keiser

cc: NRC Document Control Desk (original)
NRC Region I
Mr. M. C. Thadani, NRC Project Manager
Mr. G. S. Barber, NRC Sr. Resident Inspector