STAFF SAFETY EVALUATION RE: FOLLOW-UP ALLEGATION
REGARDING CHUGGING LOADS AT SSES UNITS 1 AND 2

The Susquehanna chugging load specification is described in Appendix I of Supplement No. 3 to the SER, NUREG-0776, dated July 1982.

A former employee of the Bechtel Power Corporation originally expressed his concerns in a letter to NRC Region V, dated March 26, 1984, regarding the generation of the chugging sources utilized in the design of the Susquehanna plants. Based on a review of this allegation, the staff concluded that the above cited chugging load specification for Susquehanna, Units 1 and 2, remains adequately conservative. The NRC staff prepared a written response to the alleger in a letter from A. Schwencer (NRC), dated June 22, 1984.

In a follow-up letter, dated July 13, 1984, the alleger indicated that the concern expressed in his letter to NRC Region V, dated March 26, 1984, and in a conference call with the NRC and its consultants on May 9, 1984, remained unanswered and/or distorted.

The staff and its consultants met on August 10, 1984, with those representatives of the Bechtel Power Corporation, who were directly responsible for the development and generation of the Susquehanna chugging loads, to determine if adequately conservative procedures had been used in generating the Susquehanna chugging loads. The following summarizes the follow-up concern and our evaluation of those concerns:

1. In Item 1, the alleger stated that the verification of the KWU 300 series was inadequate. His reasons, however, were not clear to us. He also

stated under Item 1, that "Mr. Beinkowski (sic) (NRC official) has already discovered a very serious error in Bechtel's old algorithm." This was an erroneous finding on his part, since the Stanford Research Institute (SRI) work referred to had to do with SRV loads and was entirely unrelated to the chugging loads.

2. In Item 2, the alleger asserted that the KWU 300 and 400 series were generated by different algorithms. During a meeting held on August 10, 1984, G. Ashley, of the Bechtel Power Corporation, informed us that the assertion is not correct. Ashley stated that the different algorithm mentioned was used only to determine acoustic speed but not to generate the source histories.

3. In Item 3, the alleger contended that Ashley's statement regarding FSI as the only difference in the source is false. Ashley stated that both source series were generated by the same algorithm, but the 400 series had trend removal, a different acoustic speed, and 4% damping compared to 12% damping in the 300 series. However, regardless of these differences, the basis for the staff's acceptance of the SSES chugging load specification is the favorable comparison with the JAERI test data which are bounded with substantial margin by both the 300- and 400-series sources.

4. Item 4 concerns the 4% damping factor used in the Bechtel analysis and its effect on the 300 and 400 series comparison. As stated in Item 3

above, according to Ashley, 12% was used for the 300 series and 4% for the 400 series. In both cases, however, the sources bound the JAERI data by a wide margin.

5. In response to the alleger's fifth item, concerning the "poke-throughs" of the 400 sources, Ashley mentioned that the 9 Hz. "poke-through" may be covered by the SRV load specification. While the SRV loads are certainly in this frequency range, it is not clear whether this argument is valid since a single SRV must be combined with LOCA chugging. In both cases, however, the sources bound the JAERI data by a wide margin.

6. The alleger's sixth item, which questions correctness of the mathematical algorithm used to generate KWU 300 series, was flatly denied by Ashley who indicated that the algrithm has been checked against hand calculations and against GE analysis and was proven to be correct.

7. The seventh item concerned the use of individual sources rather than envelopes for computing chugging loads. The Bechtel comparison, in response to his original concern, showed envelopes for both 300 and 400 sources. Since <u>all</u> the sources in the series are applied individually to assess the containment for chugging loads, we find that this is not a real problem. The generous bound of the JAERI data by the source envelopes is, in the staff's and its consultant's opinion, the most significant evidence of conservatism in the chugging loads for Susquehanna.

Based on the above discussion, we conclude that the follow-up concern did not alter the staff's conclusion stated in response to the original concern and in the Susquehanna SER. We conclude that the present chugging load specification for Susquehanna, Units 1 and 2, is adequately conservative.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

APR 11 1985

Docket No.: 50-387/388

Mr. Norman W. Curtis
Vice President
Engineering and Construction - Nuclear
Pennsylvania Power and Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

Dear Mr. Curtis.

SUBJECT: COMPLETION OF LICENSE CONDITION 2.C.(28)(d)(i) OF OPERATING LICENSE NPF-14 AND LICENSE CONDITION 2.C.(12)(e) OF OPERATING LICENSE NPF-22/INSTRUMENTATION FOR DETECTION OF INADEQUATE CORE COOLING

As required by License Condition 2.C.(28)(d)(i) and 2.C.(12)(e) of Operating License NPF-14 and NPF-22 respectively, you submitted on February 7, 1985 a PP&L report addressing the analysis performed by the BWR Oweners Group regarding instrumentation for detection of inadequate core cooling. This report was also resonsive to Generic Letter 84-23 which provided you with the results of the NRC staff's review of that BWR Owners Group analysis.

Generic Letter 84-23, "Reactor Vessel Water Level Instrumentation in BWRs," identified two categories of potential improvements in BWR water level instrumentation which would give increased assurance that the water level instrumentation will provide the inadequate core cooling instrumentation required by NUREG-0737, Item II.F.2 and thereby satisfy this requirement. These improvements are (1) improvements that will reduce level indication errors caused by high drywell temperature and (2) replacement of the mechanical level indication equipment with analog level transmitters unless operating experience confirms high reliability.

The report enclosed with your February 7, 1985 letter states that each of the reference legs for the narrow range, wide range and fuel zone range water level instrumentation has a vertical drop of less than seven feet inside the drywell. The maximum level error which could result from depressurization and flashing is less than nine feet, six inches. This error is acceptable for Susquehanna because an indication in the normal water level range would still result in the core being covered with water and the indicated level would track increases or decreases in water level. That report also states that the Susquehanna mechanical level switches have been demonstrated to be reliable and thus need not be replaced by analog transmitters. However, you indicate that the plant may change to analog transmitters for other reasons.

APR 11 1985

Based on the information in your February 7, 1985 submittal, the NRC staff finds that no modifications are necessary in response to Generic Letter 84-23 and that the requirements of NUREG-0737, Item II.F.2 and License Conditions 2.C.(28)(d)(i) and 2.C.(12)(e) are satisfied.

Sincerely,

A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing

cc: See next page

Susquehanna

Mr. Norman W. Curtis
Vice President
Engineering and Construction
Pennsylvania Power & Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

Jay Silberg, Esq.
Shaw, Pittman, Potts, & Trowbridge
1800 M Street, N. W.
Washington, D.C. 20036

Edward M. Nagel, Esq.
General Counsel and Secretary
Pennsylvania Power & Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

Mr. William E. Barberich
Manager-Nuclear Licensing
Pennsylvania Power & Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

Mr. R. Jacobs
Resident Inspector
P.O. Box 52
Shickshinny, Pennsylvania 18655

Mr. E. B. Poser
Project Engineer
Bechtel Power Corporation
P. O. Box 3965
San Francisco, California 94119

Mr. Thomas M. Gerusky, Director
Bureau of Radiation Protection Resources
Commonwealth of Pennsylvania
P. O. BOx 2063
Harrisburg, Pennsylvania 17120

Mr. N. D. Weiss
Project Manager
Mail Code 391
General Electric Company
175 Curtner Avenue
San Jose, California 95125

Robert W. Alder, Esquire
Office of Attorney General
P. O. Box 2357
Harrisburg, Pennsylvania 17120

Mr. William Matson
Alegheny Elec. Cooperative, Inc.
212 Locust Street
P. O. Box 1266
Harrisburg, PA 17108-1266