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JUL 30 1979

General Electric Company
L. J. Sobon, Manager
BWR Containment Licensing, MC905
175 Curtner Avenue
San Jose, CA 95125

Dear Mr. Sobon:

On March 15, 1979, you submitted the remaining sections (designated Part B) of the "Mark I Containment Program Load Definition Report," NEDO 21888, on behalf of the Mark I Owners Group.

We have completed our review of the second part of NEDO 21888 and its related references. As a result, we find that we will require additional clarification or justification for certain proposed load definition techniques, in order for us to complete our evaluation. Enclosure 1 contains specific requests for additional information relating to the second part of NEDO 21888.

The enclosed questions and the schedule for your responses have been discussed in recent meetings between the staff and representatives of General Electric and the Mark I Owners Group. Your responses to these questions are necessary to complete the documentation of the material discussed in these meetings. We are proceeding with the development of the staff's acceptance criteria for the Long Term Program Plant Unique Analyses to facilitate a timely implementation of this program.

We inadvertantly failed to distribute our first round of questions to the Mark I Owners Group. Copies of this letter are being transmitted to each licensee and, for their benefit, Enclosure 2 contains our request for additional information for the first part of NEDO 21888, which we transmitted to you on May 3, 1979.

Should you require any clarification of this request, contact C. Grimes (301-492-7110).

Original Signed By:
Darrell G. Eisenhut

D. Eisenhut, Acting Director
Division of Operating Reactors

646 221

Enclosures:
As stated

USIP:DIR

OFFICE	DOR:PSB	DOR:SL/PSB	DOR:C/PSB	DOR:AD/SE	DOR:D	DOR:AD/PS
SURNAME	CGrimes LL	PAnderson	GLainas	BGrimes	DEisenhut	SHanauer
DATE	7/25/79	7/26/79	7/25/79	7/26/79	7/28/79	7/26/79

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

JUL 3 0 1979

General Electric Company
L. J. Sobon, Manager
BWR Containment Licensing, MC905
175 Curtner Avenue
San Jose, CA 95125

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D. Eisenhut, Acting Director
Division of Operating Reactors

Enclosures:
As stated

646 222

JUL 3 0 1979

cc: R. Kohrs, MC 905
General Electric Company
175 Curtner Avenu
San Jose, CA 95125

Boston Edison Company
M/C NUCLEAR
ATTN: Mr. G. Carl Andognini
800 Boylston Street
Boston, MA 02199

Commonwealth Edison Company
ATTN: Mr. C. Reed
Assistant Vice President
P. O. Box 767
Chicago, IL 60690

Iowa Electric Light & Power Company
ATTN: Mr. Duane Arnold
President
P. O. Box 351
Cedar Rapids, IA 52406

Niagara Mohawk Power Corporation
ATTN: Mr. D. P. Dise
Vice President - Engineering
300 Erie Boulevard West
Syracuse, NY 13202

Philadelphia Electric Company
ATTN: Mr. E. G. Bouer, Jr., Esq.
Vice President and General
Counsel
2301 Market Street
Philadelphia, PA 19101

Tennessee Power Authority
ATTN: Mr. H. G. Parris
Manager of Power
500 A Chestnut Street, Tower II
Chattanooga, TN 37401

Jersey Central Power & Light Company
ATTN: Mr. I. R. Finfrock, Jr.
Vice President - Generation
Madison Avenue at Punch Bowl Road
Morristown, NJ 07960

L. S. Gifford
General Electric Company
Landow Building, Suite 203
7910 Woodmont Avenue
Bethesda, MD 20014

Carolina Power & Light Company
ATTN: Mr. J. A. Jones
Executive Vice President
336 Fayetteville Street
Raleigh, NC 27602

Georgia Power Company
ATTN: Mr. C. F. Whitmer
Vice President - Engineering
P. O. Box 4545
Atlanta, GA 30302

Nebraska Public Power District
ATTN: Mr. J. M. Pilant, Director
Licensing & Quality Assurance
P. O. Box 499
Columbus, NE 68601

Northern States Power Company
ATTN: Mr. L. O. Mayer, Manager
Nuclear Support Services
414 Nicollet Mall - 8th Floor
Minneapolis, MN 55401

Power Authority of the State of
New York
ATTN: Mr. G. T. Berry
General Manager and Chief
Engineer
10 Columbus Circle
New York, NY 10019

Yankee Atomic Electric Company
ATTN: Mr. R. H. Groce
Licensing Engineer
20 Turnpike Road
Westboro, MA 01581

Northeast Nuclear Energy Company
ATTN: Mr. W. G. Counsil, Vice President
Nuclear Engineering & Operations
P. O. Box 270
Hartford, CT 06101

646 223

REQUEST FOR ADDITIONAL INFORMATION
MARK I LONG TERM PROGRAM
LOAD DEFINITION REPORT AND RELATED REFERENCES

1. The basis for the condensation oscillation load definition technique is a limited range of data from one test in the Full Scale Test Facility. Justify that the inherent conservatisms of the proposed condensation oscillation loads out weigh the uncertainty (i.e., statistical variance) in the load magnitude. Since the condensation oscillations are a harmonic function, wherever possible data from other tests should be used to develop this justification.

2. Justify not specifying an asymmetric condensation loading condition for the suppression chamber. This justification should include an assessment of the phase relationships observed in FSTF and similar (e.g., Marviken) test data.

3. Provide "flow maps" (i.e., mass flux versus pool temperature), similar to that depicted in Figure 6.2.1-3 of NEDE-24539-P, for the DBA, IBA, and the SBA conditions Each map should overlay the typical plant, analytically predicted flow regimes with the FSTF test data (with designated air content), for both condensation oscillations and chugging, to support the conservatism in the FSTF test matrix.

4. Explain the basis for definition of condensation oscillation and chugging load amplitudes in the 1 to 2 hz range. Discuss the structural significance of loads in this frequency range.

5. Justify the filtering of "pressure spikes" from the FSTF data for the purpose of load definition. This justification should include a description of the hydrodynamic phenomena involved and a discussion of the structural response to these pressure spikes.

6. Provide a more detailed description of the FSTF "shake test" an discuss the structural damping information that can be derived fro this data. In light of this information, justify the assumed 2% damping for load definition in the analysis described in NEDE-24645-P and discuss the effects of "off-peak" amplification.

7. Demonstrate the conservatism of the condensation oscillations and chugging load definition techniques by comparing the transient structural dynamic history derived from the NEDE-24645-P analysis and that obtained from the appropriate period of FSTF test data for several typical structural responses.

8. Justify the downcomer lateral load [illegible] correction technique for those downcomers which have a na[illegible] frequency much different from that of the FSTF.

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9. In order to demonstrate the adequacy of the submerged structure drag load model, provide comparisons of analytically derived drag loads with test data, using the transient bubble pressure as the source function.

10. Specify limit criteria for oscillating or side force drag loads that will assure that the acceleration drag component is negligible. Alternately, specify a correction technique to adjust the submerged drag loads when the acceleration drag component is large in comparison to the standard drag.

11. Specify limits on the submerged drag load definition to preclude interference effects for close structures. If a large number of cases are expected to exceed these limits, generic correction techniques for interference effects should be proposed.

12. Justify the assumption of a parabolic impact pressure transient. This transient does not appear to be either realistic or conservative for all structures.

13. The proposed hydrodynamic mass factor for impact loads (K_h = 0.2) is based on Mark I header (i.e., cylindrical geometry) impact test data. However, impact test data for other geometries (NEDE-13426-P) evidence significantly higher hydrodynamic mass factors. Therefore, justify or modify the hydrodynamic mass factor to reflect the target geometries to be analyzed.

14. Justify that the impact load test data (i.e., NEDE-13426-P) for gratings is representative of the grating geometries in Mark I plants. In addition, discuss how the grating response analysis will account for the dynamic component resulting from a step change to a constant drag load.

15. Following impact, air cavities will form behind the impacted structure. Therefore, justify the use of standard drag coefficients which are based on fully submerged uniform flow.

16. Justify that the assumption of maximum pool velocity, for calculating drag following impact, is sufficiently conservative to offset the acceleration drag component.

17. Justify the use of a circumscribed circle on an impact target geometry, other than cylindrical, to determine the duration of impact. For flat-bottom geometries, this technique would appear to produce overly-long pulse durations.

18. Describe the technique used to develop the "turn down function" (ϕ) for the vent header deflector loads.

19. Provide comparisons of vent header deflector load test data with analytical predictions to demonstrate the conservatism in the proposed load definition procedure for each of the deflector types.

20. Specify the manner by which the effective hydrodynamic mass will be considered for the vent header and downcomer impact and drag loads.

21. Your response to our first-round question [illegible] was incomplete. Justify the header impact timing in consideration of the effects of compressible flow and a "fixed" flow distribution in the EPRI three-dimensional pool swell tests.

22. Provide the results of the primary system response analyses, for those BWR systems in use with Mark I containments, to support your proposed acceptance criteria for the SRV + DBA event combination.

23. Provide the load definition procedure and bases for the "off-center" T-quencher discharge loads.

24. Provide the load definition technique and bases for "tied" downcomer lateral loads.

ENCLOSURE 2

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

MAY 3 1979

General Electric Company
L. J. Sobon, Manager
BWR Containment Licensing, MC 905
175 Curtner Avenue
San Jose, California 95125

Dear Mr. Sobon:

On December 28, 1978, you submitted the first part of the "Mark I Containment Program Load Definition Report," NEDO 21888, on behalf of the Mark I Owners Group. This document describes the generic suppression pool hydrodynamic load definition techniques for the Long Term Program.

We have completed our review of the first part of NEDO 21888 and its related references. As a result, we find that we will require additional information in order for us to complete our review. When we complete our initial review of Part B of NEDO 21888, which was submitted on March 15, 1979, an additional information request will probably be necessary.

The enclosed questions and the schedule for your responses have been discussed in recent meetings between the staff and representatives of General Electric and the Mark I Owners Group. Should you require any further clarification, contact C. Grimes (301-492-7110).

Sincerely,

Darrell Eisenhut

D. Eisenhut, Deputy Director
Division of Operating Reactors

Enclosure:
As stated

cc w/enclosure:
See next page

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