



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

DEC 28 1976

Docket No. STN 50-447

MEMORANDUM FOR: D. B. Vassallo, Assistant Director for Light Water Reactors, DPM

FROM: R. L. Tedesco, Assistant Director for Plant Systems, DSS

SUBJECT: DRAFT SUPPLEMENT 2 TO THE GESSAR SAFETY EVALUATION REPORT

Plant Name: GESSAR-238 Nuclear Island
Docket Number: STN 50-447
Licensing Stage: Preliminary Design Approval
NSSS Supplier: General Electric
Architect Engineer: N/A
Containment Type: Mark III
Responsible Branch and Project Manager: LWR-1; J. Thomas
Requested Completion Date: N/S
Applicant's Response Date: N/S
Review Status: Incomplete

Enclosed is a draft of the CSB input to supplement 2 to the GESSAR Safety Evaluation Report and a request for additional information.

The applicant has provided additional information by Amendment Number 45 to the GESSAR-238 NI dated October, 1976, in support of the sizing of the containment vacuum breakers for a postulated containment depressurization based on the assumption of inadvertent containment spray operation. Based on our review of the above information and our confirmatory calculations, we find the containment external design pressure of 0.8 psid and the containment vacuum breaker design acceptable. We require, however, that the applicant commit to maintain the containment atmosphere conditions during normal plant operation within the conditions specified in the Technical Specifications for the GESSAR-238 Nuclear Island. Our draft SER supplement for this item is enclosed.

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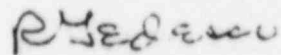
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We reviewed the applicant's load criteria for submerged structures as described in the applicant's report "Unsteady Drag on Submerged Structures," which is attached to the letter dated March 24, 1976 (G. L. Gyorey of GE to R. L. Tedesco of NRC). During the course of our review, the Containment Systems Branch has identified several areas of concern and has prepared the enclosed request for additional information. The concerns include the following:

1. The applicability of the method which assumes an idealized spherical gas bubble for air charging through the horizontal vent system following a LOCA.
2. The applicability of the single spherical bubble for the SRV with quencher as discharge device.

We are also reviewing GE's proposed change to the impact load profile for structures located above the pool surface. We plan to meet with GE and further discuss this aspect. We will address these matters in a future supplement to the SER.



Robert L. Tedesco, Assistant Director
for Plant Systems
Division of Systems Safety

Enclosure:
As Stated

cc: S. Hanauer
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R. Heineman
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Draft Supplement 2 to the Safety Evaluation Report
GESSAR-238 NI
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6.2.1.5 External Pressure Design

Delete paragraph 2, page 6-13,

"The containment vessela motor operated globe valve."

Insert in place of paragraph 2, page 6-13, the following:

The Containment vessel is designed for an external pressure of 0.8 psid. A containment vacuum relief system consisting of two, 24-inch lines, is provided to maintain external pressures within design limits. Each vacuum relief line connects the containment to shield building annulus, and contains one check valve in series with an air operated butterfly valve.

Delete paragraph 4, page 6-13,

"We have reviewed the applicant's sizing analysis in a supplement to the Safety Evaluation."

Insert in place of paragraph 4, page 6-13 the following:

We have reviewed the applicant's sizing analysis for the containment vacuum breakers. The limiting containment operating condition of 90°F containment temperature with an associated relative humidity of 20 percent was selected by the applicant to establish the vacuum breaker sizing. Based on these conditions, the applicant has calculated that an external pressure differential of 0.72 psid will not be exceeded. We have performed confirmatory calculations using the CONTEMPT LT 26 computer program which are in reasonable agreement with the applicant's result.

The CONTEMPT calculation assumes instantaneous vaporization of the spray water until the containment reaches 100 percent relative humidity.

Based on our review and our confirmatory calculations, we find the external containment design pressure and the containment vacuum breaker sizing acceptable. However, we require that the applicant commit to maintain the containment atmosphere conditions during plant operation within conditions specified in the Technical Specifications. They are a minimum relative humidity of 20 percent at 90°F and 30 percent at 105°F. Between these limits, the minimum humidity would vary linearly.

Request for Additional Information
GESSAR-238 Nuclear Island
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041.1 The method presented in the GE report "Unsteady Drag on Submerged Structures," which is attached to the letter dated March 24, 1976 (G. L. Gyorey of GE to R. L. Tedesco of NRC), has been reviewed for the calculation of submerged structure loads. Since this model presents a departure from our current acceptance load criteria for submerged structures, the following additional information should be provided:

1. Discuss and justify the applicability of this model, which assumes an idealized spherical gas bubble, for air charging through the horizontal vent system following a LOCA. Information should include methods of determining initial bubble pressure, location, size and velocity. Compare and justify these initial conditions with the PSTF test data.
2. Discuss and justify the applicability of this single spherical bubble for the SRV quencher design. Information should include methods of determining initial bubble pressure, location, size and velocity. Method of calculating bubble pressure attenuation should be also provided.

041.2 With respect to the development of the drag coefficients for submerged structures, provide the following additional information:

1. A detailed description of the analytical method used to calculate the drag coefficient for all complex structures (i.e., pipe supported by an I-beam).
2. Applicable experimental data.