

GENERAL ELECTRIC

NUCLEAR POWER

SYSTEMS DIVISION

GENERAL ELECTRIC COMPANY, 175 CURTNER AVE., SAN JOSE, CALIFORNIA 95125
(408) 925-5722 M/C 682

MFN 073-83
JNF 026-83

April 20, 1983

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, DC 20555

Attention: Mr. D.G. Eisenhut
Division of Licensing

Gentlemen:

SUBJECT: IN THE MATTER OF 238 NUCLEAR ISLAND
GENERAL ELECTRIC STANDARD SAFETY ANALYSIS REPORT
(GESSAR II) DOCKET NO. STN 50-447

REVISED RESPONSES

Attached please find revised responses to selected questions of the Commission's August 25, 1982 information request. This information is provided in the following attachments:

Attachment
Number

Branch

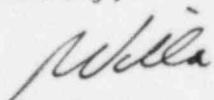
1

Structural & Geotechnical Engineering

2

Meterology & Effluent Treatment Systems

Sincerely,


Glenn G. Sherwood, Manager
Nuclear Safety & Licensing Operation

Attachments

cc: F.J. Miraglia (w/o attachments)
D.C. Scaletti

C.O. Thomas (w/o attachments)
L.S. Gifford (w/o attachments)

E003

8304220467 830420
PDR ADDCK 05000447
A PDR

ATTACHMENT NO. 1

REVISED RESPONSES TO
STRUCTURAL & GEOTECHNICAL ENGINEERING
QUESTIONS

220.13
(3.7.2)

It is not clear in the discussion provided in Sections 3.7.2.3 and 3.7.2.5 of your FSAR how you have accounted for the vertical flexibility of floors in the generation of the vertical response spectra. Accordingly, provide the procedures you have used to account for this phenomenon.

Response

An analysis which accounts for the vertical flexibility of floors was performed. The procedures and results are summarized as follows:

The Auxiliary Bldg. floor at El. 28'-6" was selected upon review of existing data which indicated that it will produce the maximum vertical amplification due to floor flexibility.

Three typical floor panels were modeled by Spring Dashpot Oscillators; they were then added to the mass point at the floor of interest in the mathematical model of the building. A time-history analysis was performed for the soil case expected to provide the maximum response. Vertical Response Spectra for the selected floor panels and the main building mass point were generated and a comparison with the current corresponding response spectrum curve at the selected floor was made.

Since the correlation was not satisfactory for the vertical direction, GE will require that the applicant verifies that the floor response is within the seismic envelope used for design of equipment, systems and components.

ATTACHMENT NO. 2

REVISED RESPONSES TO
METEROLOGY & EFFLUENT TREATMENT SYSTEMS
QUESTIONS

19.3.1.6 QUESTION/RESPONSE 1.6 (460.09)

QUESTION 1.6

Provide a table in Section 1.8 of your FSAR comparing the design features of the liquid, gaseous and solid radwaste systems with each position of Regulatory Guide 1.43, Revision 1 (October 1979). Justify each position for which an exception is taken. If information is provided in other sections of the FSAR for the individual items, cross-references to these sections are acceptable. We consider compliance with Section C.5 of Regulatory Guide 1.143 to be essential. Verify whether you satisfy our acceptance criteria for concentrations of radioactive constituents in accordance with Item II of Section 15.7.3 of the Standard Review Plan (SRP). Our position is that limiting doses to 0.5 rems, as stated in Section 11.3.2.20 of your FSAR, is not an acceptable alternative. (1.8, 11.2, 11.3 and 11.4)

RESPONSE 1.6

The offgas system meets the requirements of Position C.2.1.3 of Regulatory Guide 1.143 by the following:

- (1) The offgas delay tanks have no natural frequencies between 2 and 35 Hz.
- (2) The stress in the supports, based on a horizontal static equivalent force of 0.15g is less than 1.33 times the allowable stress level of AISC Manual of Steel Construction 7th Edition, 1970.

19.3.1.6 QUESTION/RESPONSE 1.6 (460.09) (Continued)

- (3) The tanks are located on the base mat of the ~~building~~ ~~containing them~~ Turbine building.

This method of compliance has been accepted by the NRC in NUREG-0174.

In addition, the entire Offgas System meets the following requirements:

- (1) The system design pressure is at a minimum 350 psi and in part is as high as 1000 psi while the system operating pressure is 6.7 psig.
- (2) The material of construction is required to demonstrate high notched stress ductility.
- (3) All pressure retaining butt welds are 100% radiographed.
- (4) The system must pass a 10^{-5} atm cc/sec helium leak test.
- (5) The buildings housing the Gaseous Radioactive Waste Processing System will be designed in accordance with the Uniform Building Code.

A conservative analysis of the dose consequences of failure of this system has been provided in topical reports NEDE-21056-P and NEDE-21056-1P.

- (4) The Applicant will design the vault containing the charcoal tanks to resist the OBE as specified in Regulatory Guide 1.143 Section 5.2 as permitted in section 5.3.

19.3.1.6

QUESTION/RESPONSE 1.6 (460.09) (Continued)

The above notwithstanding, the last paragraph of Section A of BTP ETSB 11-5 calls for the analysis of a single failure of an active component in the waste gas system as providing "adequate and acceptable design solutions..."

As a part of the design of the GESSAR II Offgas System, the system does not release any activity untreated through a single active component failure. An operational error could bypass the main charcoal delay tanks; however, the post-treatment monitor would cause closure of the redundant bypass valves. The post-treatment monitor is single-failure resistant. In the event the preset Hi-Hi-Hi value of the post-treatment monitor is exceeded, a valve downstream of the monitor automatically closes and causes the closure of the normal system drains to further prevent inadvertent bypass.

Finally, application of the BTP ETSB 11-5 100 $\mu\text{Ci/sec/MWt}$ (after 30 min decay) source term to the standard site yields a site boundary dose less than 400 mrem.

Description of compliance with the geology and hydrology considerations of NUREG-0800 Subsection 15.7.3 is the responsibility of the Applicant.

11.3.2.20 Seismic Design

Equipment and components used to collect, process, or store gaseous radioactive waste are classified as non-Seismic Category I. Conservative analyses presented in Section 15.7 demonstrate that equipment failure will not result in doses exceeding the 0.5-Rem guidelines of Regulatory Guide 1.29.

The support elements, including the skirts, legs and anchor bolting, for the charcoal adsorber tanks of the offgas system are designed as follows:

- (1) the fundamental frequency of the charcoal adsorber tanks including the support elements is greater than 33 Hertz;
- (2) the charcoal adsorber tanks are mounted on the base mat of the building housing the tanks;
- (3) the charcoal adsorber tanks including the support elements are designed with a horizontal static coefficient of 0.15 g; and
- (4) the stress levels in the support elements of the charcoal adsorber tanks shall not exceed 1.33 times the allowable stress levels permitted by the AISC Manual of Steel Construction, Seventh Edition, 1970.

These seismic requirements ^{comply with the} ~~are acceptable alternatives to the~~ requirements of Regulatory Guide 1.143. ~~(formerly Branch Technical Position ETSE No. 11-1) (Reference 8).~~

11.3.2.21 Quality Control

A program will be established that is sufficient to assure that the design, construction, and testing requirements are met. The following areas will be included in the program:

- 41 The Applicant will design the vault containing the charcoal tanks to 11.3-15 resist the OBE as specified in Regulatory Guide Section 5.2 as permitted in Section 5.3.

11.3.5 References (Continued)

3. Siegwarth, D. P., Measurement of Dynamic Adsorption Coefficients for Noble Gases on Activated Carbon, 12th AEC Air Cleaning Conference.
4. Standards for Steam Surface Condensers, Sixth Edition, Heat Exchange Institute, New York, NY (1970).
5. Underhill, Dwight, et al., Design of Fission Gas Holdup Systems, Proceedings of the Eleventh AEC Air Cleaning Conference, 1970, p. 217.
6. Nesbitt, L. B., Design Basis for New Gas Systems, July 1971, NEDE-11146 (General Electric Company Proprietary).
7. N66 SJAE Offgas Treatment System - Amendment 1 (supplements Licensing Topical Report, August 1978 (NEDE-21056-1-P) (Proprietary).
8. NUREG-0124 (Supplement 1 to NUREG-75/110) Safety Evaluation Report. Related to the Preliminary Design of the GESSAR-238 Nuclear Island Standard Design, US Nuclear Regulatory Commission, September 1976, pages 3-1 and 3-2.