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Vogtle Project

June 19, 1985

Director of Nuclear Reactor Regulation
Attention: Ms Elinor G. Adensam, Chief
Licensing Branch #4
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

File: X7BC35
Log: GN-645

NRC DOCKET NUMBERS 50-424 AND 50-425
CONSTRUCTION PERMIT NUMBERS CPPR-108 AND CPPR-109
VOGTLE ELECTRIC GENERATING PLANT - UNITS 1 AND 2
REQUEST FOR ADDITIONAL INFORMATION: RESPONSE TO Q210.40

Dear Mr. Denton:

As a result of a telephone conversation with members of your staff on June 18, 1985, the attached change has been made to the subject question. This change will be incorporated in FSAR Amendment 17 presently scheduled for July, 1985.

If you staff requires any additional information, please do not hesitate to contact me.

Sincerely,

J. A. Bailey

J. A. Bailey
Project Licensing Manager

JAB:js

Enclosure

cc: D. O. Foster
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Question 210.40

Provide a summary of how piping vibration amplitudes measured during preoperational tests will be related to a stress level. In addition, clarify what is meant by the "endurance limit as defined in the ASME Code, Section III."

Response

A vibration monitoring program will be conducted at VEGP prior to plant startup. The program will include the appropriate safety-related instrument lines, up to the first anchor, and will be based upon the guidance provided in ANSI/ASME OM3 for relating measured vibration levels to stress levels. The endurance limit is defined as the value of the alternating stress at one million cycles.

For steady - state vibration, the maximum calculated alternating stress intensity S_{alt} shall be limited as defined below:

(a) For ASME Class 1 piping systems:

$$S_{alt} = \frac{C_2 K_2 M}{Z} \leq \frac{S_{el}}{\alpha}$$

where

C_2 = secondary stress index as defined in the ASME Code

α = allowable stress reduction factor: 1.3 for materials covered by Fig. I-9.1: or 1.0 for materials covered by Fig. I-9.2.1 or I-9.2.2 of the ASME Code

K_2 = local stress index as defined in the ASME Code

M = maximum zero to peak dynamic moment loading due to vibration only, or in combination with other loads as required by the system Design Specification

S_{el} = $0.8 S_A$ where S_A is the alternating stress at 10^6 cycles from Fig. I-9.1; or S_A at 10^6 cycles from Fig. I-9.2.2 of the ASME Code. The user shall consider the influence of temperature on the Modules of Elasticity

Z = section modules of the pipe

(b) For ASME Class 2 and 3 piping, ANSI B31:

$$S_{alt} = \frac{C_2K_2\ M}{Z} \leq \frac{S_{el}}{\alpha}$$

where

$C_2K_2 = 2i$

i = stress intensification factor, as defined in Subsection NC and ND of the ASME Code or B31

If significant vibration levels are detected during the test program which had not been previously considered in the piping system analysis, consideration should be given to modifying the Design Specification to reverify applicable code conformance.