BALTIMORE GAS AND ELECTRIC COMPANY

GAS AND ELECTRIC BUILDING

BALTIMORE, MARYLAND 21203

ARTHUR E. LUNDVALL, JR.
VICE PRESIDENT
SUPPLY

October 15, 1979

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

Attn: Mr. Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors

Subject: Calvert Cliffs Nuclear Power Plant
Units Nos. 1 & 2, Dockets Nos. 50-317 & 50-318
Steam Generator Feedwater Water Hammer

Reference: BG&E letter dated 11/13/78 from A. E. Lundvall, Jr. to H. R. Denton, request for amendment.

Gentlemen:

The referenced letter contained our initial request for the deletion of the feedwater flow restriction contained in the Calvert Cliffs Unit No. 2 operating license (para. 2.c.3). That request was made based on our having made a design modification to the feedwater sparger ring which resulted in a top discharge rather than a discharge from the bottom of the ring.

Subsequent to the above request, NRC notified us that they were absorbing our request into their generic water hammer review effort and that additional information would be required to aid the NRC Staff in this effort. Several verbal and written communications have ensued concerning operating procedures and design configurations. As a result of those communications, the water hammer issue has effectively been resolved, and the purpose of this letter is to formally document our operational commitment to limit the use of main feedwater under certain conditions and also to provide details on the design flow path of feedwater as it "leaks" from the feedring-sleeve-nozzle area into the steam generator.

Accordingly, the enclosures to this letter provide the following information:

Enclosure (1) Cleanances between labyrinth seal area of sleeve and feedwater nozzle.

Enclosure (2) Clearances between sleeve and feedwater nozzle.

Enclosure (3) Operational commitment and discussion of design leakage.

Enclosure (4) Combustion Engineering Drawings: E 233-173-6
E 233-180
E 233-189

1221 060

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All of this information has been provided verbally to your Staff.

It is assumed that your generic water hammer review encompasses both Units of Calvert Cliffs and that the resultant license amendment will include both Units since both have the same feedring modification and both will have the same operational commitment detailed in Enclosure (3). Also, we have determined that the enclosed information constitutes supplementary information to our previous referenced request, and that no additional fee is required pursuant to 10 CFR Part 170.

Very truly yours,

Arthur E. Lundvall, Jr.

cc: J. A. Biddison, Esquire
G. F. Trowbridge, Esquire
Mr. E. L. Conner, Jr. - NRC
Mr. P. W. Kruse - CE

1221 061

ENCLOSURE (1)

Labyrinth Seal Assembly — Drawing 233-180, Detail "F"

O.D. 16.122 $^{+.000''}_{-.005''}$

Feedwater Nozzle Assembly — Drawing 233-173, Detail "A"

I.D. 16.125 $^{+.005''}_{-.000''}$

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1) Minimum Seal to Nozzle Tolerance

16.125" - 16.122"= .003"

Radial Clearance .003" ÷ 2 = .0015"

2) Maximum Seal to Nozzle Tolerance

16.130" - 16.117" = .013"

Radial Clearance .013" ÷ 2 = .0065"

1221 062

ENCLOSURE (2)

Feedwater Sleeve Assembly Drawing 233-180, Step #2

O.D. 15-7/16" ± 1/32"

Feedwater Nozzle Assembly Drawing 233-173

I.D. 16-1/4" + 1/32"
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1) Minimum Sleeve to Nozzle Tolerance

16-1/4" - 15-15/32 = 25/32" or .78125"

Radial Clearance .78125" ÷ 2 = .391"

2) Maximum Sleeve to Nozzle Tolerance

16-9/32" - 15-13/32" = 28/32" or .875"

Radial Clearance .875" ÷ 2 = .4375"

1221 063

ENCLOSURE (3)

A. Discussion of Design Leakage Path

Combustion Engineering, Inc. (CE), our NSSS Supplier, has informed us that since all other possible drainage paths from the main feedring are seal welded, the only drainage (leakage) path would be behind the sleeve, past the labyrinth seal. CE has also conducted a brief review concerning the amount of leakage during a trip condition when the flow rate in the main feedwater nozzle is reduced to 5% flow at 70°F which is approximately 750 gpm. It is their engineering judgement that, with the basic geometry and obvious flow restrictions involved in the labyrinth region of the liner, the flow leakage behind the liner during these conditions will be less than the mass flow in the pipe, and therefore, with the top discharge modification to the feedwater ring, the pipe and feed ring should remain full of water. We concur with this engineering judgement and have concluded that a detailed design calculation is not necessary.

B. Operational Commitment

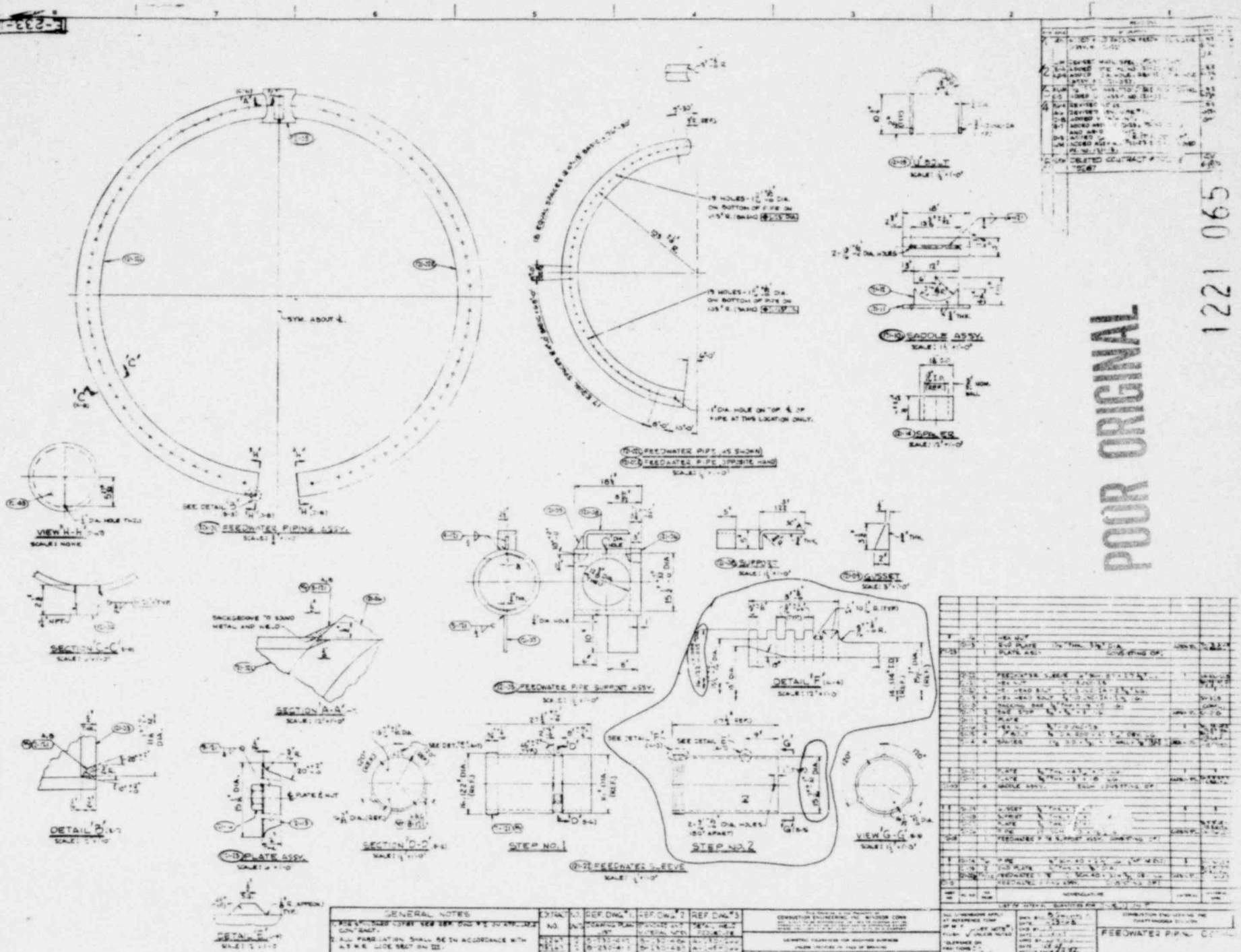
Given the initial condition that the steam generators are being supplied with feedwater from the main feedwater system via the main feed ring, we propose to continue to supply feedwater using this path provided the following conditions do not exist simultaneously:

a) The volumetric flow rate of main feedwater being supplied to a steam generator drops below 5 percent of full (100%) feedwater flow;

b) The water level in the steam generator drops below the top of the main feedring.

If the above conditions exist simultaneously, we propose to cease feeding the steam generator from main feedwater and to commence feeding the steam generator using the auxiliary feedwater system via the separate and independent auxiliary feedring at such time as it is determined that this flow path should be initiated based on the operating conditions in effect at that time.

When the steam generator water level has once again risen above the top of the main feed ring, the normal feed path using the main feed water system will be permissible.



POOR ORIGINAL

1221 065

GENERAL NOTES

1. ALL WELDING SHALL BE IN ACCORDANCE WITH A.S.M.E. CODE SECT. VIII.

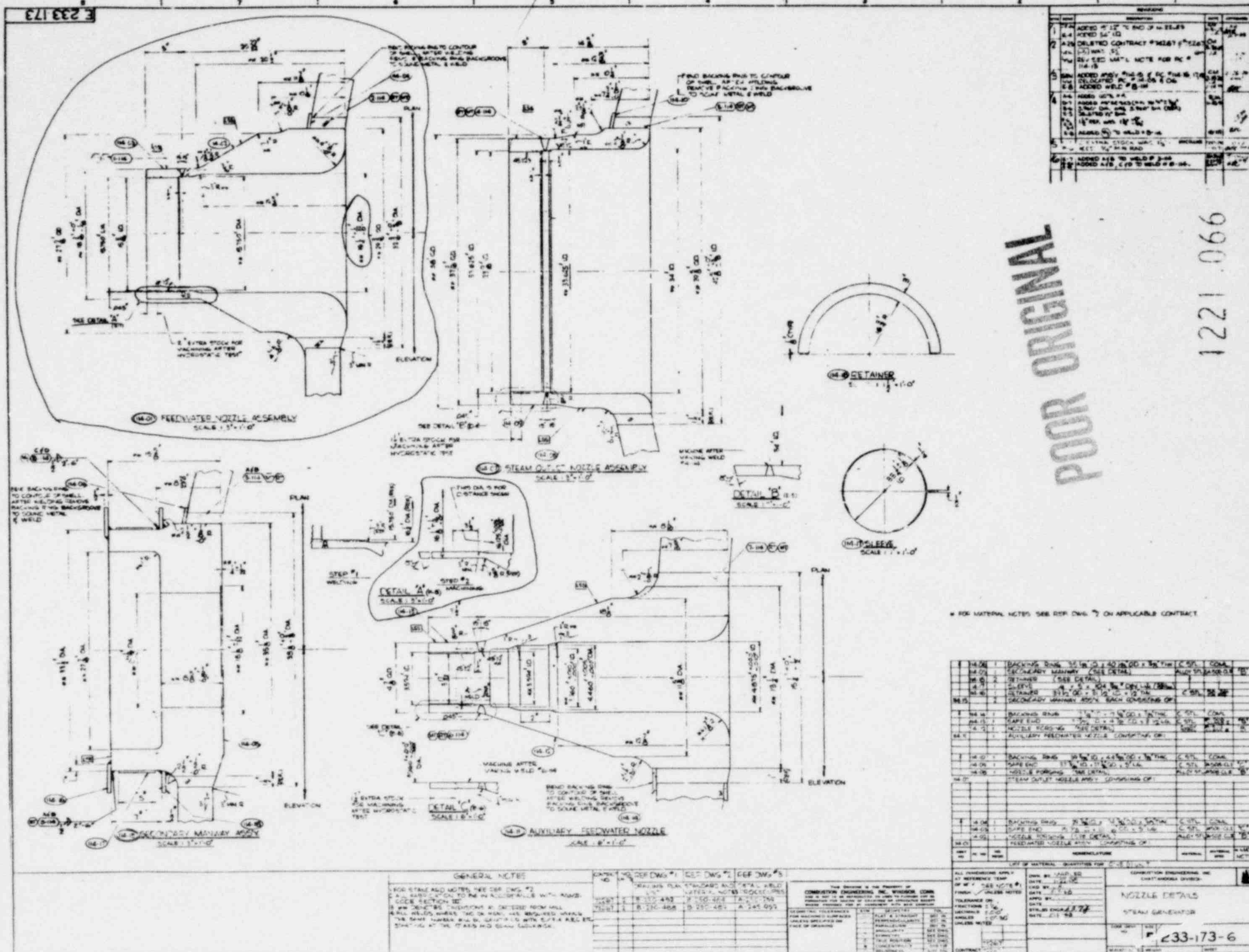
DETAIL NO.	REF. DWG. #1	REF. DWG. #2	REF. DWG. #3

COMBUSTION ENGINEERING, INC. WINDSOR, CONN.

FEEDWATER PIPING

STEAM GENERATOR

F 233 - 50


E 233173
FEEDWATER NOZZLE ASSEMBLY
STEAM OUTLET NOZZLE ASSEMBLY
RETAINER
SLEEVE
DETAIL "A"
DETAIL "B"
DETAIL "C"
SECONDARY MANWAY ASS'Y
AUXILIARY FEEDWATER NOZZLE
PLAN
ELEVATION
GENERAL NOTES
NOZZLE DETAILS
STEAM GENERATOR
E33-173-6
POOR ORIGINAL
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