BALTIMORE GAS AND ELECTRIC COMPANY

GAS AND ELECTRIC BUILDING

BALTIMORE, MARYLAND 21203

June 19, 1979

ARTHUR E. LUNDVALL, JR.
VICE PRESIDENT
SUPPLY

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
Unit Nos. 1 & 2, Docket Nos. 50-317 & 50-318
Feedwater System Design Information

Reference: NRC letter dated 5/25/79 from Stello to
PWR Licensees, same subject.

Gentlemen:

The enclosed information is being submitted in response to the referenced letter, which described a possible design problem with feedwater piping. This information covers only items 1 through 4 of the request. The remainder will be forwarded in our 60-day response.

1) Enclosed are two isometric drawings of the feedwater lines in the containment, one drawing per unit. All feedwater piping in the containment is 16" diameter schedule 80. Also enclosed are forty-nine drawings detailing all pipe supports on these lines. Enclosure 1 cross-references the pipe support drawings with the notations used on the stress isometric drawing to show the location of the pipe supports.

   All check valves are 900 # valves made of cast carbon steel ASTM A-216, Gr. WCB, buttwelded with a pressure seal cap or bolted body joint. The valves have tilting disk, a welded or integral seat ring and are stellited.

2. The basic results of the stress analyses for these feedwater lines are enclosed as Enclosure 2. Each pipe is designated on the calculation sheets. The computer printouts resulting from these stress calculations are over six hundred pages in length and are not included in this submittal. They can be made available upon request. What is included are the pipe supports, nozzle, and penetration loadings as well as a flexibility analysis for each line. An explanation of the data presented is included as Enclosure 3.

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Fabrication History

1. The feedwater piping is made of carbon steel ASTM A-106 Gr. C. Feedwater nozzle bodies are made of SA 508 Class II material with the safe ends made of SA 508 Class I material. Reducers are ASTM A-234 Gr. WPC. Elbows are made from ASTM A-234 Gr. WPB. The feedwater ring is also ASTM A-106 Gr. C.

2. There is no piping welded to the feedwater ring. Elbows are shielded metal arc (SMA) welded using a preheat temperature of 60 - 350 F and no post-weld heat treatment. All piping welds are either manual gas tungsten arc (GTA) welds or SMA welds. Preheat temperature was under 200 F. Post-weld heat treatment consisted of stress relieving to 1150 F. The joint configuration is open butt with a single bevel and no backing ring.

If you have any questions concerning this information, please contact us.

Very truly yours,

Arthur E. Lundvall Jr.

cc: J. A. Biddison, Esquire
G. F. Trowbridge, Esquire
Mr. E. L. Conner, Jr. - NRC
Mr. J. W. Brothers - Bechtel

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Enclosure No. 1

Unit No. 1

Stress Isometric Drawing No. 91-093B (SK-M-600)

Pipe Support Number (As denoted on stress isometric)	Pipe Support Drawing Number(s)
Pipe Line # 16"DB1-1018	
H-1	12600-2690, 2691
R-1	12600-2692
R-2	12600-2693, 2694, 2695
R-3	12600-2696, 2697, 2698
Pipe Line # 16"DB1-1019	
H-2	12600-2700
H-3	12600-2701
R-1	12600-2702, 2703
H-4	12600-2704
R-2	12600-2705, 2706
H-5	12600-2707, 2708
R-4	12600-2709
H-6	12600-2710
H-7	12600-2711
R-5	12600-2712
R-3	12600-2713, 2714
H-7	12600-2715

Unit No. 2 Stress Isometric - Drawing No. 91-407-B (SK-M-998)

Pipe Line # 16"DB1-2018	
H-1	13600-3186, 2187
R-1	13600-2188, 2189
R-2	13600-2190
R-3	13600-2191, 2192

Pipe Line # 16"DB1-2019

H-3	13600-2193
H-4	13600-2194, 2195
R-10	13600-2196, 2197
H-5	13600-3198
R-4, R-5	13600-2199, 2200
H-6	13600-2201, 2202
R-8	13600-2203
H-7	13600-2204
H-8	13600-2205
R-9	13600-2206
R-7, R-6	13600-2207, 2208
H-2	13600-2209

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ENCLOSURE NO. 3

Restraint Loadings

For each restraint, (labeled as R-X on the stress isometric drawing) the thermal, operating basis earthquake (OBE), design basis earthquake (DBE) and seismic restraint loads are presented. Seismic restraint loads are loads resulting from the differental pipe movements which would occur during the earthquake. The total restraint design load is the absolute summation of the thermal, DBE and seismic restraint loads rounded off to the next highest thousand pounds. The thermal and seismic pipe movements in the three directions are also presented.

Hanger Loadings

For each hanger (labeled as H-X on the stress isometric drawing) the thermal load, the weight of the pipe, insulation and operating fluid are listed in addition to the seismic anchor movement and the DBE loads.

For spring hangers which are not subject to thermal loading, the loading used to design the hanger spring component is equal to the sum of the weights of the pipe, insulation and operating fluid or that figure rounded off the the next highest 500 pounds. The load used to design the support steel (also referred to as "dead weight" load) is equal to the sum of the weights of the pipe, insulation and operating fluid multiplied by a factor of 1.07 and rounded off to the next highest 500 pounds.

For rigid supports the summation of the loads depends on the direction of the thermal and dead weight loads. If the two act in the same direction (i.e. both loads act in the negative direction), the absolute value of these loads are added to the seismic loads, and the total is rounded off upwards to the next 1,000 pounds. If the thermal and dead weight loads do not act in the same direction, the higher of these two loads is using absolute summation to the loads due to seismic anchor movement and DBE loads.

If two sets of thermal loads are listed, the upper value refers to the normal operating condition, and the lower value applies to the accident condition thermal load value. The higher of these values is used to calculate the total load for support steel and rigid hanger component design.

Penetration Loading

For the feedwater penetration, the thermal expansion loads, dead weight loads, OBE loads, DBE loads and seismic anchor movement loads are listed along with the movements associated with all these forces. The two sets of thermal loads and movements refer to the normal operating condition (upper value) and the accident condition (lower value).

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Nozzle Loadings

For the steam generator nozzles, the thermal and dead weight loads and moments are listed along with the OBE, DBE, and seismic anchor loads and moments. For the analysis on Unit No. 1 two values are listed for the OBE and DBE loads. These represent loadings in the X-Y and Y-Z planes which are stated separately because of the limited capability of the computer code used at the time. The Unit No. 2 analysis lists the total seismic loads resulting from an updated code that combined all seismic loads into a single value. The total net design load is the absolute summation of the thermal, dead weight, OBE, and seismic anchor movement loads.