



## Omaha Public Power District

1823 HARNEY \* OMAHA, NEBRASKA 68102 \* TELEPHONE 536-4000 AREA CODE 402

August 10, 1979


Director of Nuclear Reactor Regulation  
ATTN: Mr. Robert W. Reid, Chief  
Operating Reactors Branch No. 4  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Reference: Docket No. 50-285

Gentlemen:

The Omaha Public Power District herewith submits additional information in response to the Commission's letter of May 25, 1979, regarding PWR feed water systems. This information, together with our letter of June 18, 1979, provides a complete response to the Commission's inquiry.

Sincerely,

  
T. E. Short  
Assistant General Manager

TES/KJM/BJH/sd

xc: LeBoeuf, Lamb, Leiby & MacRae  
1333 New Hampshire Avenue, Suite 1100  
Washington, D. C. 20036

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## DESIGN

### Question 2

*Provide the results of any stress or fatigue analyses which were performed for this system.*

### Response

The stress analysis (computer printouts) for the feedwater system, from the steam generator nozzles out to the containment penetrations, has been submitted to the Commission in a letter dated August 9, 1979, from Mr. T. E. Short to Mr. K. V. Seyfrit.

### Question 2

*Provide the details of the welding processes used to make the nozzle-to-pipe, pipe-to-sparger, and piping welds. Include details of welding such as: preheat, joint configuration (include with or without backing ring), and post weld treatment, if any.*

### Response

The seal weld at the junction of the thermal expansion sleeve to the distribution (see figure 1) is internal to the steam generator and is not a structural weld. The steam generator nozzle-to-safe end welds were made during the manufacturing of the steam generators. The steam generators were fabricated in accordance with Section III of the ASME Boiler and Pressure Vessel Code in effect at the time of construction, 1966-1967. CE drawing E-232-485-5 previously provided in a letter to the Commission dated June 18, 1979, shows the joint configuration both before and after final machining which left a smooth bore even transition as shown in DETAIL "B" of the drawing. No backing rings were used in the nozzle-to-safe end welds. The welds were made using a shielded manual metal arc process. The components were preheated, 60 F minimum to 400 F maximum. The postweld heat treatment was performed with the initial temperature of the furnace at less than 600 F. The heating rate at temperatures above 600 F was limited to 400 F per hour or 400 divided by the maximum shell or head plate thickness in inches, but was not required to be less than 100 F per hour. The postweld heat treatment was maintained at  $1125\text{ F} \pm 25\text{ F}$  for one hour minimum per inch of weld thickness but in no case less than one hour.

The maximum cooling rate was the lesser of 500 F per hour or 500 divided by the maximum shell or head thickness in inches, but was not required to be less than 100 F per hour. The weldments were permitted to be removed from the furnace when their temperature had fallen to 600 F.