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SEP 30 1991

U.S. Nuclear Regulatory Commission
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Gentlemen:

In the Matter of the Application of	)	Docket Nos. 50-390
Tennessee Valley Authority	)	50-391

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2 - PIPE SUPPORT DESIGN CRITERIA REVISIONS FOR MINIMUM DESIGN LOAD (TAC NO. 79718)

As discussed during a teleconference with the NRC staff on September 17, 1991, several revisions have been developed for the Watts Bar Design Criteria WB-DC-40-31.9, "Criteria for Design Piping Supports and Supplemental Steel in Category I Structures," which should serve to effectively resolve the Minimum Design Load open issue (TAC No. 79718). These revisions are summarized in Enclosure 1 to this transmittal.

Final Safety Analysis Report revisions associated with these criteria have been incorporated in the forthcoming Amendment 68. Marked-up pages of the FSAR are included as Enclosure 2.

Enclosures 3 and 4 provide additional documentation to respond to staff questions on the final report for Pipe Support Minimum Design Load Evaluation.

If you have any questions, please telephone P. L. Pace at (615) 365-1824.

Sincerely,

John H Garrity

John H. Garrity

Enclosures
cc: See page 2

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U.S. Nuclear Regulatory Commission

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ENCLOSURE 1

Reference: Watts Bar Design Criteria No. WB-DC-40-31.9, "Criteria for Design of Piping Supports and Supplemental Steel in Category I Structures"

The following criteria replace the corresponding sections within the referenced design criteria document.

2.3.6 Minimum Design Load

A load equal to the larger of 150 pounds or the weight of a standard water-filled ANSI B31.1 pipe span.

3.5 Friction

3.5.1.d The friction force shall be calculated by multiplying the static coefficient of friction by the normal operating load which acts perpendicular to the contact surface.

3.5.1.g Friction loads shall be used in conjunction with normal loads in checking allowable stresses.

3.7 Stiffness/Deflection Requirements

3.7.1.a All pipe support structural steel, except as described below, shall be designed to limit the maximum deflection to 0.0625" or less (based on the greater of the seismic/dynamic load components of the upset or faulted loading conditions, or based on the minimum design load). In addition, the maximum deflection shall be limited to 0.125" or less (based on the total design load). These analyses shall be performed independently for each restrained direction (axis) at the point of load application.

ENCLOSURE 2

MARKED-UP FSAR PAGE 3.9-45

2) All thermal modes of operation are considered in load evaluation. Thermal loads are not considered to relieve primary loads induced by gravity, other sustained loads, or seismic events. | 64

3) Installation tolerances are not considered a source of load reduction unless special installation requirements are required. | 64

4) The required movement in unrestrained directions for the line being supported is tabulated in the table of support loads. The support design is arranged to accommodate this required movement of the piping. Hangers are designed in such a manner that they cannot become disengaged by any movement of the supported pipe. | 64

5) If ASME Code Case N-318-3 is used in the design of integral welded attachments to the piping pressure boundary, the requirements of Regulatory Guide 1.84 are documented in TVA calculations. | 64

d. Deformation Limits

Pipe support stiffness/deflection limitations are required for seismic Category I.

The following criteria shall be used for support stiffness requirements:

1) All pipe support structural steel, except as described below, is designed to limit the maximum deflection to 0.0625" (based on the greater of the seismic/dynamic load components of the upset~~, emergency,~~ or faulted loading conditions). In addition, the maximum deflection is limited to 0.125" (based on the total design load). These analyses were performed independently for each restrained direction (axis) at the point of load application. (or based on the minimum design load). | 64

2) The first dynamic support in each lateral direction adjacent to strain sensitive equipment (i.e., pump, compressor or turbine nozzle) is designed to limit the maximum deflection to 0.0625" (based on the total design load). This analysis is performed independently for each restrained direction (axis) at the point of load application.

3) Except for the unbraced cantilevers, baseplate rotation or deflection due to baseplate flexibility are considered insignificant and, therefore, are not considered. Anchor bolt stiffness is not considered for this evaluation.

ENCLOSURE 3

EXPLANATION OF PHASE I X-DIRECTION LOADS

FOR 47A 920-38-6

EXPLANATION OF PHASE I X-DIRECTION LOADS FOR 47A920-38-6

Attachment D of the Phase I & II Report (RIMS# L44910418802) provides an example of the Phase I screening. For pipe support 47A920-38-6 (Problem N3-31-15A, Joint 430) the following X-direction loads are described:

	+X	-X
DYN	599	599
NOR	0	308
UPS	151	616
FAU	443	908

The +X load for the Faulted case is less than the dynamic load due to the -X deadweight load. The pertinent load sources and the summations for the Normal and Faulted conditions are provided below.

LOAD SOURCES

deadweight:	'DW' =		-209
thermal:	'TE' =	+53 ,	-82
bellows:	'BL' =	+0 ,	-17
faulted seismic/dynamic:	'E2' =	+599 ,	-599
faulted thermal:	'TF' =	+53 ,	-82

LOAD CONDITIONS

		sum	TPIPE output
NORMAL: **+X** =	DW + (+TE) + (+BL) -209 + 53 + 0	= -156	0
NORMAL: **-X** =	DW + (-TE) + (-BL) -209 + (-82) + (-17)	= -308	-308
FAULTED: **+X** =	DW +(+TF) +(+BL) +(+E2) -209 + 53 + 0 + 599	= +443	+443
FAULTED: **-X** =	DW +(-TF) +(-BL) +(-E2) -209 +(-82) +(-17) +(-599)	= -907	-908

ENCLOSURE 4

PIPE SUPPORT MINIMUM DESIGN LOAD EVALUATION

FINAL REPORT