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Nebraska Public Power District

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May 1, 1979

Mr. Karl V. Seyfrit, Director
U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region IV
611 Ryan Plaza
Suite 1000
Arlington, Texas 76011

Subject: Response to IE Bulletin 79-04
Incorrect Weights for Swing Check Valves
Manufactured by Velan Engineering Corporation

Dear Mr. Seyfrit:

In response to IE Bulletin 79-04 "Incorrect Weights for Swing Check Valves Manufactured by Velan Engineering Corporation" the following information is provided for your review. Only one piping system in Seismic Category Class I (RHR Service Water Booster Pumps, Injection Water System, ISO 2852-62) is affected by the possible weight discrepancies involving the subject check valves.

Action Item #1

List all Seismic Category I piping systems (or portions thereof) where 3, 4, or 6 inch diameter Velan swing check valves are installed or are scheduled to be installed.

Response:

RHR Service Water Booster Pumps, Injection Water System, ISO 2852-62 (Partial).

Action Item #2

Verify for all those systems identified in item 1 above that correct check valve weights were used in the piping analysis. Explain how and when the correct valve weights were determined.

7906070373 2231 .42

Response:

Load calculations for this ISO are not in our files. We generated new calculations following B&R's procedure for similar existing piping systems using the correct weights for Velan swing check valves listed in IE Bulletin No. 79-04.

Basic load summaries were performed using the weights of all components of the piping system (pipes, insulation, fluid carried, flanges, fittings, valves, etc.) and then determining what proportion of the load would be carried by each hanger in the system. This is normally accomplished by distributing one-half of each line segment's weight to each hanger supporting that segment. In the attached calculations, concentrated loads were applied to the hangers in such a way that the total load to the hangers is actually greater than the load to be supported.

The minimum safety factor used was determined originally when the allowable load (Column C) for each hanger was calculated by the original designer. The allowable load (Column C) was less than the actual capacity by a factor which is equal to the minimum safety factor. The actual hanger load (Column B), as revised and as shown, still being less than the allowable load (Column C), maintains the minimum safety factor. (See Response, Item 4.)

Action Item #3

If incorrect valve weights were used, explain what actions have been taken or are planned to re-evaluate the piping systems affected.

Response:

New calculations were generated using correct swing check valve weights. (See Attachment "A").

Action Item #4

Specify for all the affected systems identified in Item 1 whether modifications were or are required to the piping systems or their supports because of changes in valve weight. Also, include the basis for this determination. For those systems in which the actual valve weight is greater than the design weight, provide a summary of stresses and loads and their allowable limits for the piping and its supports.

Response:

No modifications are required for the piping system and for the involved pipe hangers listed:

Column A Hanger No.	Column B Actual Hanger Load	Column C Hanger Allowable Load (including original safety factor)
H294	257#	1130#
H295	272#	1130#
H259	774#	4384#
H278	774#	4384#

Action Item #5

Identify the analytical technique including identification of any computer codes used to determine the stresses indicated in Item 4.

Response:

Manual calculations similar to the method B&R used on piping systems of this type at CNS.

If you should have any questions or comments, please do not hesitate to contact me.

Sincerely,

Fred E. Williams

For Jay M. Pilant
Director of Licensing
and Quality Assurance

/cmk

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DESIGN CALCULATIONS SHEET

NPPD	Sheet 1 of 3
Job No. EWR A708	Prepared by T Hoeman Date 9-27-7
Subject Valve Check Values with incorrect weights	Checked by K. BARNES Date 4-27-7 1KB

The two values which may have incorrect weights used in the original support calculations are supported by hangers number # 294, #295, #259, and # 278.

The original calculations performed used simple tabulations of the piping loads to determine the loads at the hangers. This reanalysis will also be done per that method.

The loads determined will be compared to the design allowables listed on the individual Hanger Sketches. If the new loads are less than the allowables no further analysis will be required. If the load is greater the hanger will most likely need to be modified

Hanger #H294 (shown on 150-2852-65 rev 3 and 2852-66 rev 2)
The load is all due to 6" Pipe which weighs 16 lb/ft.
Length = 1'5" + 4'7" + 0'6" + 9'6" = 11'2" = 11.17'
Load = 11.17 x 16 = 179#
The value is almost ~~totally~~ supported by hanger H259 but for conservatism apply 50% of its load to this hanger

$$\text{load} = 179 + \frac{155}{2} = 256.5\ \#$$

The existing hanger is a 6" Figure 260 Grinnell Hanger which has an allowable of 1130#

∴ hanger # 294 is ok

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DESIGN CALCULATIONS SHEET

NPPD	Sheet 2 of 3
Job No. EWR A708	Prepared by J Horman Date 4-27-
Subject Vilan Check Valves with Incorrect Weights	Checked by L. K. BARNES AKB Date 4-27-7

Hanger H295 (shown on ISO 2852-65 rev3 & 2852-66 rev2)
This again is due to 4" Pipe @ 16#/ft.

length = 1'5" + 4'7" + 0'6" + 5'7½" = 12' 1½" = 12.12'

load = 12.12 x 16 = 194

add ½ valve weight = 155/2 = 77.5

load = 194 + 77.5 = 271.5 #

The hanger is a 4" Figure 260 Grinnell Hanger which has a capacity of 1130#

∴ hanger is ok.

Hangers H259 & H278 (shown on ISO 2852-65 rev3)
These hangers support symmetrical sections of line and are therefore equivalent in design and loading.
Both lines are somewhat complex & to guarantee a conservative result more load than would be expected to be supported by the hanger will be applied to it.
calculate the total load and then divide by two to determine the load transmittable to the hangers.

4"Φ Pipe-length = [0'6" + 6'8" + 1'4"] x2 = 8'6" x2 = 17'
-wt @ 16#/ft = 17 x 16 = 272#

3"Φ Pipe length = 1'2" + 1'3⅛" + 0'11½" + 1'3⅜" + 1'1¼" + 1'6" + 2'9¾" = 10'
wt @ 11#/ft = 10.12 x 11 = 122#

4" valves - two @ 155# ea
wt = 2 x 155 = 310#

3" valves - nine @ 72# ea
wt = 9 x 72 = 648#

150# WN flanges (3") 14 @ 14# ea
wt = 14 x 14 = 196#

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Attachment

DESIGN CALCULATIONS SHEET

NPPD	Sheet 3 of _
Job No. EWR 708	Prepared by T Hoeman Date 4-27
Subject Velan Check Values with incorrect weights	Checked by L. K. BARNES Date 4-27-7 TKB

th total wt = 212+122+310+648+196 = 1598#

therefore wt per hanger = $\frac{1598}{2}$ = 779#

The existing hanger is a 3" Pipe Construction Type with concrete anchors which is welded to elbows at vertical risers.

The Allowable is 4384#

∴ the hanger is ok

4-27-79

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