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SUBJECT: Addresses remaining open items raised during 881220 telcon re Copes-Vulcan air operated valves.

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AEP:NRC:1084B

Donald C. Cook Nuclear Plant Units 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
STATUS OF SYSTEMS WITH COPES-VULCAN VALVES

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Attn: A. B. Davis

March 13, 1989

Dear Mr. Davis:

A conference call was held among NRC Region III, NRR, and AEPSC representatives on December 20, 1988. The purpose of the call was to discuss NRC comments on AEP:NRC:1084 dated December 9, 1988. This initial letter described plans for addressing discrepancies found in both weight and center of gravity of Copes-Vulcan, air-operated valves installed on small-bore piping systems at the Donald C. Cook Nuclear Plant Units 1 and 2. The attachment to this letter formally addresses the remaining open items raised during the December 20, 1988, conference call.

Specifically, the attachment provides the revised piping system acceptance criteria (2.0 Sy) as well as a listing of the installed Copes-Vulcan valves with the indicated original and revised weights and centers of gravity. In addition, the current status of the valve modifications and stress analyses for both units is indicated in the attachment. As noted, all affected Copes-Vulcan valves in Unit 2 are now within the UFSAR stress analysis criteria. Finally, the basis for the use of code case N-411, as requested by NRC, is addressed in the attachment.

This document has been prepared following Corporate procedures that incorporate a reasonable set of controls to ensure its accuracy and completeness prior to signature by the undersigned.

Sincerely,

M. P. Alexich
Vice President

ldp

A001
1/1

Attachment

cc: D. H. Williams, Jr.
W. G. Smith, Jr. - Bridgman
R. C. Callen
G. Charnoff
NRC Resident Inspector - Bridgman
G. Bruchmann

ATTACHMENT TO AEP:NRC:1084B

The following information is provided to formally document responses to NRC open items raised during a December 20, 1988, conference call regarding Copes-Vulcan valves installed at the Cook Nuclear Plant.

1) Piping System Acceptance Criteria

AEP:NRC:1084 provided interim acceptance criteria for evaluating the piping systems containing the subject Copes-Vulcan valves. In the December 20, 1988, conference call, the NRC took issue with use of a 2.4 Sy allowable piping stress. As a result, the equation for the piping stress acceptance criteria, provided in paragraph 3.1 of the attachment to AEP:NRC:1084, was revised as follows:

$$S_p + S_w + S_D < 2.0\ S_y$$

Where S_p = Longitudinal Pressure Stress
S_w = Dead wt. Stress Plus Stresses due to Other Mechanical Loads
S_D = Design Basis Earthquake Stress
S_y = Material Yield Stress at Design Temp.

2) Status of Cook Nuclear Plant, Unit 1

The results of our review indicate that 36 of the 38 Copes-Vulcan valves installed on Unit 1 are within the interim acceptance criteria of 2.0 Sy. As discussed in a January 4, 1989 conference call, our preliminary stress analysis using response spectra method indicated that the interim acceptance criteria would be exceeded on two valves, 1-QRV-113 and -114. We expect that a more refined method, time history response, will result in calculated stress levels during a design basis earthquake to be within the interim acceptance criteria. Results of the time history response analysis are expected this month.

The bounding analysis performed to evaluate the pipe support members indicated two locations where a support member (plate) exceeded the interim acceptance criteria; however, calculated stresses were below the lower bound collapse load and, therefore, the supports would remain functional.

3) Status of Cook Nuclear Plant, Unit 2

Recent modifications to pipe supports in the Unit 2 systems have returned the 28 affected piping systems containing Copes-Vulcan valves to within the UFSAR code allowables.

4) Listing of Affected Copes-Vulcan Valves

Tables 1 and 2 of this attachment provide a list of the affected valves for Units 1 and 2 respectively. With the exception of QCR-301, the valves were supplied by Westinghouse under the original NSSS scope of supply. Valves 1- and 2-QCR-301 were purchased directly from Copes-Vulcan in 1981 for a design modification. The centers of gravity for the valves obtained from Westinghouse were not included on the valve drawings provided to the Cook Nuclear Plant and are, therefore, not available.

5) Basis for the Usage of Code Case N-411

The following address the five conditions specified in ASME Section III, Division 1, Regulatory Guide 1.84 Revision 25, "Design and Fabrication Code Class Acceptability," to provide a reasonable basis for the use of the Code Case N-411-1 in the Interim Acceptance Criteria evaluation.

(1) The code case damping values for piping systems are used consistently in the response spectra analysis.

(2) Cook Nuclear Plant floor response spectra were developed by averaging the results obtained from four scaled earthquake records as noted in our response to FSAR Question Q.5.73-2, Amendment 19 dated January 1972. The Cook Nuclear Plant Ground Response Spectra are conservative with respect to seismic history at the plant site.

In addition, the majority of the piping systems reviewed are at an elevation of about 620'. The response spectra utilized for the analyses are for elevation 651.3' since they are the closest spectra available above the piping systems. Use of the higher elevation, amplified response spectra provides an additional conservatism in the analyses.

(3) The evaluations are being performed for interim acceptance only and not for reconciliation work or support optimization.

(4) The code case damping values are not used in evaluations where supports that are designed to dissipate energy by yielding are used.

(5) The code case damping values are not used in systems where significant stress corrosion cracking has occurred. Stress corrosion cracking has not been identified in the systems recently evaluated.

TABLE 1

Page 1 of 2

COPES VULCAN VALVES

PAGE 1

UNIT NO: 1

AEP VALVE NO.	WESTINGHOUSE VALVE NO.	C-V DWG. NO.	SIZE	RATING	ORIGINAL WT.(LBS.)	REVISED WT(LBS.)	ORIGINAL C-O-G	REVISED C-O-G
1-IRV-110	1-IA56-RE	L-137918	1	600	180	184	-	20.50
1-IRV-120	1-IA56-RE	L-137918	1	600	180	184	-	20.50
1-IRV-130	1-IA56-RE	L-137918	1	600	180	184	-	20.50
1-IRV-140	1-IA56-RE	L-137918	1	600	180	184	-	20.50
1-IRV-111	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
1-IRV-121	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
1-IRV-131	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
1-IRV-141	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
1-IRV-115	3/4-IA58-RE	L-140209	0.75	1500	170	240	-	19.25
1-IRV-125	3/4-IA58-RE	L-140209	0.75	1500	170	240	-	19.25
1-IRV-135	3/4-IA58-RE	L-140209	0.75	1500	170	240	-	19.25
1-IRV-145	3/4-IA58-RE	L-140209	0.75	1500	170	240	-	19.25
1-IRV-116	3/4-IA58-RE	L-140209	0.75	1500	170	240	-	19.25
1-IRV-126	3/4-IA58-RE	L-140209	0.75	1500	170	240	-	19.25
1-IRV-136	3/4-IA58-RE	L-140209	0.75	1500	170	240	-	19.25
1-IRV-146	3/4-IA58-RE	L-140209	0.75	1500	170	240	-	19.25
1-IRV-112	1-IA56-RES	L-137919	1	600	180	184	-	20.5
1-IRV-122	1-IA56-RES	L-137919	1	600	180	184	-	20.5
1-IRV-132	1-IA56-RES	L-137919	1	600	180	184	-	20.5
1-IRV-142	1-IA56-RES	L-137919	1	600	180	184	-	20.5
1-IRV-300	2-RA56-RE	L-138035	2	600	260	225	-	19.125
1-QCR-300	2-IA56-RE	L-138023	2	600	240	228	-	19.7
1-QCR-301	-	E-198820	2	600	295	295	21.3125	21.3125
1-IRV-50	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
1-IRV-60	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
1-QRV-160	2-IA58-RG	L-144157	2	1500	240	334	-	21.875
1-QRV-161	2-IA58-RG	L-144157	2	1500	240	334	-	21.875
1-QRV-162	2-IA58-RG	L-144157	2	1500	240	334	-	21.875
1-QRV-113	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
1-QRV-114	1-IA58-RE	L-137968	1	1500	170	225	-	19.375

TABLE 1

Page 2 of 2

COPES VULCAN VALVES

UNIT NO: 1 PAGE 2

AEP VALVE NO.	WESTINGHOUSE VALVE NO.	C-V DWG. NO.	SIZE	RATING	ORIGINAL WT.(LBS.)	REVISED WT(LBS.)	ORIGINAL C-O-G	REVISED C-O-G
1-IRV-251	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
1-IRV-252	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
1-IRV-255	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
1-GCR-314	1-IA38-RES	L-138930	1	1500	175	206	-	18.8125
1-QRV-301	2-RA56-DD	L-137822	2	600	210	210	-	13
1-IRV-147	3/4-IA58-RE	L-140209	0.75	1500	170	240	-	19.25
1-IRV-148	3/4-IA58-RE	L-140209	0.75	1500	170	240	-	19.25
1-QRV-170	1-RA58-RD	L-140975	1	1500	175	141	-	12.75

TABLE 2

Page 1 of 1

COPES VULCAN VALVES

PAGE 1

UNIT NO: 2

AEP VALVE NO.	WESTINGHOUSE VALVE NO.	C-V DWG. NO.	SIZE	RATING	ORIGINAL WT.(LBS.)	REVISED WT(LBS.)	ORIGINAL C-O-G	REVISED C-O-G
2-IRV-110	1-IA56-RE	L-137918	1	600	180	184	-	20.5
2-IRV-120	1-IA56-RE	L-137918	1	600	180	184	-	20.5
2-IRV-130	1-IA56-RE	L-137918	1	600	180	184	-	20.5
2-IRV-140	1-IA56-RE	L-137918	1	600	180	184	-	20.5
2-IRV-111	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
2-IRV-121	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
2-IRV-131	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
2-IRV-141	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
2-IRV-112	1-IA56-RES	L-137919	1	600	180	184	-	20.5
2-IRV-122	1-IA56-RES	L-137919	1	600	180	184	-	20.5
2-IRV-132	1-IA56-RES	L-137919	1	600	180	184	-	20.5
2-IRV-142	1-IA56-RES	L-137919	1	600	180	184	-	20.5
2-IRV-300	2-RA56-RE	L-138035	2	600	260	225	-	19.125
2-QCR-300	2-IA56-RE	L-138023	2	600	240	228	-	19.7
2-QCR-301	-	E-198820	2	600	295	295	21.3125	21.3125
2-IRV-50	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
2-IRV-60	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
2-QRV-160	2-IA58-RG	L-144157	2	1500	240	334	-	21.875
2-QRV-161	2-IA58-RG	L-144157	2	1500	240	334	-	21.875
2-QRV-162	2-IA58-RG	L-144157	2	1500	240	334	-	21.875
2-QRV-113	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
2-QRV-114	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
2-IRV-251	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
2-IRV-252	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
2-IRV-255	1-IA58-RE	L-137968	1	1500	170	225	-	19.375
2-GCR-314	1-IA38-RES	L-138930	1	1500	175	206	-	18.8125
2-QRV-301	2-RA56-DD	L-137822	2	600	210	210	-	13
2-QRV-170	1-RA58-RD	L-140975	1	1500	175	141	-	12.75