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August 27, 1984
84056.027

Mr. J. B. George
Project General Manager
Texas Utilities Generating Company
Comanche Peak Steam Electric Station
Highway FM 201
Glen Rose, Texas 76043

Subject: Cable Tray Support Review Questions
Comanche Peak Steam Electric Station
Independent Assessment Program - Phase 4
Job No. 84056

Dear Mr. George:

Attachment A contains additional cable tray support review questions. If there are any questions while preparing responses, please call.

Very truly yours,

N. H. Williams

N. H. Williams
Project Manager

NHW:jm

cc: Mr. S Burwell (USNRC)
Mr. S. Treby (USNRC)
Mr. D. Wade (TUGCO)
Ms. J. Van Amerongen (EBASCO/TUGCO)
Mrs. J. Ellis (CASE)
Mr. R. Ballard (G&H)

H001
1/1

ADD: NSIC
Region IV

ATTACHMENT A

CABLE TRAY SUPPORT REVIEW QUESTIONS

1. Incorrect Member Sizes

References: (1) Gibbs & Hill, Inc. Drawing 2323-E1-0713-01-S, Revision 3

(2) Brown & Root, Inc. Drawing FSE-00159

(3) American Institute of Steel Construction, Inc. Manual of Steel Construction, 7th ed.

The cable tray supports listed in Table 1, attached, are type A_2. Reference 1 indicates that the supports are "A_2. (except all members to be MC6 x 12)." A review of the assembly drawing sheets (reference 2) for the supports indicates that two of the supports require C6 x 8.2 sections for the hanger members and C4 x 7.25 sections for the beams, and that the remaining five supports require MC6 x 12 sections for all members.

During Cygna's walkdowns, the listed supports were examined to determine which section had been installed. Cygna measured the dimensions of the hangers but was unable to measure the beams since they were covered with fire protection. The results are shown in Table 1. An MC6 x 12 section was installed as a hanger in one case only. These findings contradict the member specifications shown on references 1 and 2.

Please provide Cygna, using existing documentation (see also Cygna letter 84056.022, question 2), with the member sizes that were used in the seven supports listed in Table 1 and justification and documentation that these supports are adequate to resist the applied loads.

2. Angle Braces

The cable tray designs employ single angle braces to resist either transverse or longitudinal loadings. Details for brace-frame and brace-concrete connections show the angles loaded in an eccentric fashion. Eccentric loads will produce moments about the principal axes as noted on the attached sketch. Cygna's review of cable tray supports noted that such eccentricities and the resultant moments have not been addressed in all cases.

Please provide Cygna with justification and documentation for the adequacy of the single-angle braces used in all cable tray support configurations.

ATTACHMENT A (Continued)

CABLE TRAY SUPPORT REVIEW QUESTIONS

Table 1

Cable Tray Member Sizes

Support No.	Dimensions (see Note 1)		Member Size		
	Depth (in)	Flange Width (in)	Existing (note 2)	Required Per Ref. 1	Required Per Ref. 2
2992	6	1-7/8	C6 x 8.2	MC6 x 12	C6 x 8.2
2994	6	1-7/8	C6 x 8.2	MC6 x 12	MC6 x 12
3005	6	1-7/8	C6 x 8.2	MC6 x 12	C6 x 8.2
3017	6	1-7/8	C6 x 8.2	MC6 x 12	MC6 x 12
3021	6	1-7/8	C6 x 8.2	MC6 x 12	MC6 x 12
3111	6	2-1/2	MC6 x 12	MC6 x 12	MC6 x 12
6654	6	2-1/8	C6 x 13	MC6 x 12	MC6 x 12

Notes: 1. Dimensions are based on measurements by Cygna of vertical channel.

2. Member sizes are determined by selecting the channel type from reference 3 which most closely matches the measured depth and flange width.

3. Cable Tray Fire Protection Weights.

Reference: TUGCO Engineering Procedure CP-EI-4.0-49, Revision 1.

Cygna's review of the cable tray supports included a check of the fire protection weights for those trays within the review scope. The review noted that the total weight for the trays listed in Table 2 exceeded the allowable load of 35 psf specified in section 3.2.2 of the referenced procedure. Section 3.2.2.1 of the referenced procedure states that when the tray support design weights are exceeded due to the application of the fire barrier, the support spans and the tray supports are to be reevaluated for the effects of the actual weight.

Cygna noted that none of the trays which exceeded design loads were checked for span length, nor were the supports reevaluated for the effects of the additional weight.

CP-EI-4.0-49 specifically states that the actual weights, the as-built configuration, and the effects of any CMC's and DCA's shall be considered in the reevaluation of the supports. Cygna is concerned that the cumulative effect of fire protection weights from all trays on a given support may exceed the allowable levels and that the cable tray supports may not be reevaluated for these increased loads.

ATTACHMENT A (Continued)

CABLE TRAY SUPPORT REVIEW QUESTIONS

Please provide Cygna with assurance that:

(i) The tray spans and supports associated with the cable tray segments listed in Table 2 are adequate to resist the actual applied loads. Please consider the effects of the actual weights for all trays on the affected supports.

(ii) The effects of all trays which have weights that exceed the design weight due to the application of fire protection are considered in the reevaluation of the cable tray supports.

ATTACHMENT A (Continued)

CABLE TRAY SUPPORT REVIEW QUESTIONS

Table 2

Tray Segments Which Exceed Design Weight

Tray Segment Number	Tray Weight (LF)	Tray Weight (PSF)	Design Weight (PSF)	Percent Exceedance
T11ØAAA08	37.10	37.10	35.0	6.00
T12GABF10	70.58	35.29	35.0	0.83
T12GABF11	70.58	35.29	35.0	0.83
T12GABF12	70.58	35.29	35.0	0.83
T12GABF13	70.58	35.29	35.0	0.83
T12GABF14	70.58	35.29	35.0	0.83
T12GABF15	70.58	35.29	35.0	0.83
T12GABF16	70.58	35.29	35.0	0.83
T12GABF24	70.80	35.40	35.0	1.14
T12GABF25	70.80	35.40	35.0	1.14
T12GABF30	70.58	35.29	35.0	0.83

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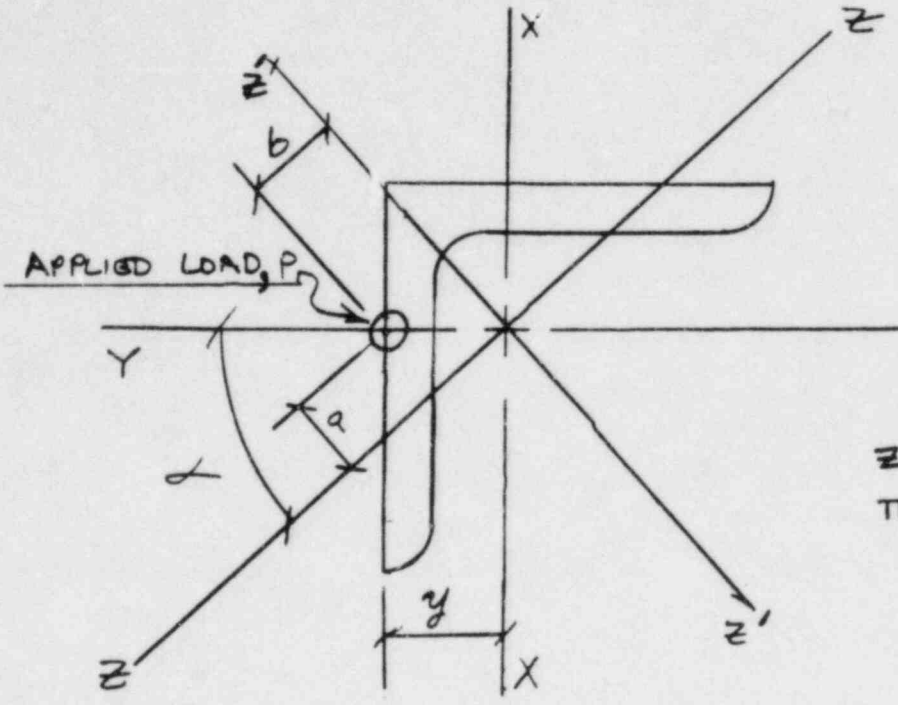
Calculation Sheet

Project: TEXAS UTILITIES - CPSES IAP	Prepared By: J. P. R.	Date: 23 AUG '84
Subject: ECCENTRIC LOADING OF ANGLES	Checked By:	Date:
System: REVIEW QUESTION 2	Job No: 84056	File No:
Analysis No:	Rev. No: 0	Sheet No:



Z-Z AND Z'-Z' ARE THE PRINCIPAL AXIS.

$a = y \sin\alpha$

$b = y \cos\alpha$

MOMENT ABOUT ZZ = $Pa = P_y \sin\alpha$

MOMENT ABOUT Z'Z' = $Pb = P_y \cos\alpha$