



ENERGY
SERVICES

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October 30, 1985
84056.094

Mr. W.G. Council
Executive Vice President
Texas Utilities Generating Company
Skyway Tower
400 North Olive Street, L.B. 81
Dallas, TX 75201

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

Dear Mr. Council:

In Cygna letter 84056.089 of October 21, 1985, a page was inadvertently omitted from the subject cable tray/conduit support review questions. Attached please find the complete list of the Phase 4 cable tray/conduit support questions and open items. Please call if you have any questions or require clarification of the attached list.

Very truly yours,

N.H. Williams
Project Manager

Attachment

cc: Mr. V. Noonan (USNRC) w/attachment
Ms. A. Vietti-Cook (USNRC) w/attachment
Mr. S. Treby (USNRC) w/attachment
Mr. W. Horin (Bishop, Liberman, et al.) w/attachment
Ms. J. van Amerongen (TUGCO/EBASCO) w/attachment
Mrs. J. Ellis (CASE) w/attachment
Mr. D. Pigott (Orrick, Herrington & Sutcliffe) w/attachment
Mr. F. Dougherty (TENERA) w/attachment
Mr. R. Ballard (Gibbs & Hill) w/attachment
Mr. J. Beck (TUGCO) w/attachment
Mr. J. Redding (TUGCO) w/attachment

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Subject: Weld Underrun and Undercut Reporting

References: Communications Report dated 16 November 1984, 4:00 p.m., "Cable Tray/Conduit Review Questions," Keiss, Horstman, and Russ participating.

Information Needs: Per the referenced Communications Report, Cygna received and reviewed Brown & Root Welding Procedures 35-1195-MES-106B and WES-029. By review of these procedures and the cable tray and conduit inspection procedures, Cygna was able to determine the dates that the undercut and underrun discrepancies were in effect. However, in order to evaluate the root cause of the undercut and underrun discrepancies, Cygna requires documentation regarding the initial discovery and causes of these welding problems, the format used for informing the appropriate organizations of the existence of the welding problems, and any documentation in which the corrective action to these welding problems is defined.

Subject: Attachment to Richmond Insert Clusters

References:

1. Communications Report dated 7 December 1984, 8:30 a.m., "Richmond Insert Allowables," Kissinger and Russ participating
2. Communications Report dated 18 December 1984, 9:45 a.m., "Richmond Insert Allowables," Kissinger and Russ participating
3. Gibbs and Hill Specification 2323-SS-30, Revision 0, "Structural Embedments"

Information Needs: Reference 3 lists the requirements and allowable shear and tension values to be used in the design of Richmond Inserts at CPSES, including those inserts arranged in clusters. References 1 and 2 list Cygna's concerns regarding Gibbs and Hill's use of Richmond Insert allowables which are greater than those for inserts arranged in clusters. The reply provided to Cygna in Reference 2 indicated that cable tray supports could not be attached to insert clusters, because such clusters were reserved for pipe whip restraints and jet impingement shields. Therefore, for the cable tray support group to utilize any insert in a cluster, a special analysis would have to be performed.

In order for Cygna to evaluate the possible extent of any discrepancy, please provide the following:

- a) The documentation provided to the cable tray support engineers, the conduit support engineers, and craft regarding the use of Richmond Inserts arranged in clusters. Documentation for the periods prior to and after the release of Gibbs and Hill Specification 2323-SS-30, Revision 0 is required.
- b) If documentation was not provided to the appropriate engineering sections and craft, please provide a description of the procedures used to determine the

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extent and the impact of the release of Reference 3 on any supports that were installed on Richmond Insert clusters prior to March 1981.

- c) A description of the analyses to be performed by the responsible engineer for supports, other than whip and impingement shield restraints, that were installed on Richmond Insert clusters.
- d) A description of the responsibilities of the Field Damage Study Group in the evaluation of supports, other than whip and impingement shield restraints, installed on Richmond Insert clusters.

Subject: Reaming of Unistrut P2558 Clamps

Information Needs: Conduit support type CA-5a may consist of a P2558 clamp which attaches the conduit directly to the concrete using Hilti Kwik-bolts through the holes in the clamp. For conduits with diameters less than 2", the P2558 clamp holes must be reamed to accommodate the 3/8" Hilti Kwik-bolts. The unaltered clamp was designed for use with 1/4" Unistrut bolts. Modification of the clamp for use with 3/8" Hilti Kwik-bolts and Hilti washers could result in fit-up problems with the curved portion of the clamp.

To assure that fit-up problems are prevented, please provide Cygna with the reaming instructions for the P2558 clamps.

Subject: Drawing Revisions Used in the Evaluations of Design Changes for Conduit Supports

Information Needs: Inspection reports document the revision number of the drawing used in the inspection of a conduit support installation. In the review of calculations for design changes, such as CMCs and the addition of fire protection, Cygna has noted that, in many cases, the drawing revisions used in the support evaluation were not the same as the drawing revision documented in the final inspection report.

Please provide Cygna with any instructions and/or procedures regarding use of design drawings, particularly revisions of those drawings, in the support evaluation for CMCs and fire protection. If instructions or procedures do not exist, please provide Cygna with a description of the standard practice for those evaluations.

Subject: Retention and Distribution of 2323-S-0910 Drawing Sheets

References: TUGCO Engineering Instruction CP-EI-4.0-4, Revision 3, "Field Structural Engineering Group Design Control Instruction"

Information Needs: Section 2.2.2 of the referenced instruction discusses the transfer of responsibility of document distribution from FSEG to DCC. Section 2.2.2 also states that previously distributed copies are valid only for engineering and office use. Since the 2323-S-0910 drawing package has undergone constant revision, it may be

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difficult to distribute and control revisions, both void/superseded and current, and to control use of those revisions.

Please provide Cygna with any procedures, instructions, or statements of standard practice, by both FSEG previously and DCC currently, concerning the following:

- a) Distribution of drawing revisions, including identification of receiving parties and documentation and/or acknowledgment of receipt
- b) Retention of void/superseded revisions by the controlling organization
- c) Identification of void/superseded revisions by the receiving parties
- d) Retention and use of void/superseded revisions by the receiving parties

Subject: Calculations for Conduit Support Type CA-5a Provided in Response to Cygna Comments

- References:**
1. Communications Report dated 10 October 1984, 9:30 a.m., Keiss, Kissinger, et al. participating
 2. Communications Report dated 18 October 1984, 9:00 a.m., Kissinger, Keiss, et al. participating
 3. Gibbs & Hill Calculation 2323-SCS-153C, Set 1, Sheets 154-160

Information Needs: On 10 October 1984 at the CPSES site (Reference 1), Cygna received Reference 3 in response to a request for calculations considering 5" diameter conduits on CA-5a supports. On 18 October 1984 (Reference 2), Gibbs & Hill agreed to revise the calculations in Reference 3 to consider installation tolerances but would not be supplying Cygna with a copy of the revision, since the changes were not expected to impact the generic design significantly.

In order for Cygna to finalize the design review of CA-5a, please provide the abovementioned revision to the calculation in Reference 3.

Subject: Development of Conduit Support Types CA-1a and CA-2a

- References:**
1. Cygna Conduit Review Issue List, Item 19
 2. Communications Report dated 18 February 1985, 10:25 a.m., Patel, Leong, and Russ participating
 3. TUGCO Instruction CP-EI-4.0-49, Revision 1, "Evaluation of Thermolag (TSI) Fire Barrier Material on Class 1E Electrical Raceways"

Information Needs: Cygna has noted that the similarity between CA-1a and CA-2a supports has led to discrepancies in noting the support type on the inspection reports

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and the fire-protection isometrics (IN-FP drawings). In a conversation with Cygna (Reference 2), Gibbs & Hill expressed the opinion that the IN-FP drawings were more accurate in indicating the support type. Cygna has also noted that the notes on the Gibbs & Hill Drawing 2323-S-0910, Sheets CA-1a and CA-2a allow variations such that the two support types can be identical. However, the support capacities tabulated in TUGCO Instruction CP-EI-4.0-49 for the two support types are different.

Since the two support types are structurally similar, please provide Cygna with a discussion of the development and use of the two support types, including the following:

- a) Revision history of CA-1a and CA-2a
- b) Criteria for use of each type in installation and inspection
- c) Method of identification of each type by FSEG personnel in developing fire-protection isometrics
- d) Development and use of capacity tables for each type in TUGCO Instruction CP-EI-4.0-49

Subject: Modification of Superstrut C-708S Clamps

References: Gibbs & Hill Drawing 2323-S-0910, Sheet G-2a, Note 7

Information Needs: The referenced note specifies use of a C-708S clamp modified from a 4-bolt to a 2-bolt clamp by cutting both ends. Since several other 2-bolt clamps are allowed in the general notes, the reason for modification of the C-708S clamps is not clear.

Please provide Cygna with information on the modification of the C-708S clamps, including:

- a) Reason for the modification
- b) Procedure detailing the physical modification
- c) Any existing calculations for the qualification of modified clamps

Subject: Fire Protection Calculations for Conduits C12002937 and C12002938

Information Needs: During Cygna's July 1984 electrical raceway walkdown at CPSES, the CSD-16 conduit supports for conduit numbers C12002937 and C12002938 were not fire-protected. When Cygna performed the supplementary walkdowns at CPSES in June 1985, the abovementioned supports had been fire-protected.

Please provide Cygna with the fire protection isometrics and related calculations for the two supports.

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Subject: Evaluation of the Impact of Architectural Topping on Expansion Anchor Embedment

- References:**
1. SDAR CP-80-05, "Use of Architectural Concrete in Floor Slabs," dated 8 August 1980.
 2. Gibbs & Hill Drawing 2323-S-0910, Sheet G-4a, Note 5

Information Needs: The effective embedment length for Hilti expansion anchors in floor slabs surfaced with 2 inch architectural concrete topping is reduced due to the non-structural nature of the topping. TUGCO recognized this limitation and issued Reference 1 to address existing expansion anchor installations and prevent embedment deficiencies in future installations. Reference 1 indicated:

"With the conditions of no documented quality of the topping compressive strength and the topping/slab interface, the design integrity could not be assured under the postulated conditions of seismic event."

The corrective action indicated in Reference 1 includes a survey to locate all expansion anchor installations in areas with topping and an evaluation of each affected support. The supports can be evaluated by analysis, local testing, or replacement of existing expansion anchors. The civil/structural department was given the responsibility to ensure that all affected installations were investigated and documented.

Reference 2 was added to the general notes section of the conduit package 2323-S-0910 shortly after issuance of Reference 1. This note allows reduced embedment for certain supports in the 2323-S-0910 package at elevations of 832'-6" and below in all buildings. This reduced embedment was not addressed in the design calculations for generic supports in Cygna's review scope, and reference was not made to any corrective action calculations which may have been generated to specifically address SDAR-CP-80-05.

Please provide copies of the corrective action calculations or documentation for generic conduit support types addressed in Reference 2 and included in Cygna's scope. These supports are CSM-18b, CSM-18c, CSM-18d, CSM-18f, CST-3, and CST-17.

Subject: Cable Tray Spacing

- References:**
1. Communications Report dated 24 October 1984, "Cable Tray Conduit Support Design Review," Chang, Huang, et al. participating
 2. Communications Report dated 25 October 1984, "Cable Tray Support Design Review," Huang, Chang, et al. participating
 3. Communications Report dated 27 October 1984, "Cable Tray/Conduit Review Questions," Keiss, van Amerongen, et al. participating

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4. Communications Report dated 27 October 1984, "Cable Tray/Conduit Review Scope," Chang, Huang, et al. participating
5. TUGCO Component Modification Card 2646, Revision 5.

Information Needs: References 1 through 4 describe Cygna's concerns regarding the impact of clear tray spacings less than 6" on the design of cable tray supports. Reference 5 illustrates an authorized design change which also violates Gibbs & Hill's assumptions on tray spacing that were used in the design of cable tray support.

In order to assess the root cause and the impact of these discrepancies, please provide the following information regarding the spacing of cable trays as they may be installed in the field.

- a) Technical specifications which delineate the spacings required to be considered in the designs
- b) Applicable installation procedures
- c) TUGCO Procedure QI-QP-11.3-29

Subject: Voiding of Conduit Fire Protection Isometric IN-FP-213b

References: Gibbs & Hill Drawing 2323-S-0910, Sheet IN-FP-213b

Information Needs: The referenced drawings shows the conduit configuration for line C12G03126 in the Auxiliary Building, Room 179, at elevation 790'-6". The drawing is voided per CPPA-39016.

Please provide Cygna with a copy of CPPA-39016 to verify the change in fire protection requirements.

Subject: Cable Tray Support Installation Tolerances

- References:**
1. DCA 9738, Revision 4
 2. Gibbs & Hill Specification 2323-SS-16b

Information Needs: Reference 1 provides a revision to Reference 2, allowing a two degree tolerance on the plumbness of vertical structural members in cable tray supports.

Please provide the CVCs and any supporting calculations for all revisions the DCA 9738.

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Subject: TUGCO Cable Tray Support Design Drawings

- References:**
1. Communications Report dated 15 November 1984, 11:15 a.m., "Cable Tray Support Design Review - Tray Clamp Gap Criteria," Keiss and Horstman participating
 2. TUGCO Drawing TNE-S1-0902-02, Revision CP-2

Information Needs: Based on a discussion between Cygna and TUGCO (Reference 1), it was noted that TUGCO has produced their own versions and revisions of Gibbs & Hill cable tray support design drawings (Reference 2).

- a) Please provide a list of TUGCO drawings which correspond to the Gibbs & Hill 2323-S-0900 series of drawings.
- b) Please provide the procedures for the development of TUGCO drawings from the Gibbs & Hill 2323-S-0900 drawings and the procedures for the incorporation and documentation of pertinent CMCs/DCAs on the TUGCO drawings.
- c) What is the purpose of the TUGCO drawings? Are these TUGCO drawings used for engineering applications and inspections, or are the original Gibbs & Hill drawings still in use?

Subject: Cable Tray Side Rail Extensions

- References:**
1. TUGCO Instruction CP-EI-4.0-49, Revision 1, "Evaluation of Thermolag (TSI) Fire Barrier Material on Class IE Electrical Raceways"
 2. Gibbs & Hill Cable Tray Specification 2323-ES-19, Revision 1
 3. DCA 6814, Revision 6
 4. Gibbs & Hill Drawing 2323-EI-1701, Revision 10

Information Needs: Per Reference 3, side rail extensions may be added to cable trays to increase the nominal tray depth when approved by the engineer.

- 1) Are side rail extensions added in order to increase the structural capacity of a tray or to maintain the required maximum cable fill for electrical reasons?
- 2) What group is responsible for issuing cable tray modifications for the addition of side rail extensions? What change documents are used to note the modifications?
- 3) Please provide the inspection procedures used to verify the installation of side rail extensions.

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- 4) Please provide the CVC and supporting calculations for all revisions of Reference 3.

Subject: Evaluation of Electrical Raceways for the Effect of Thermolag Fire Protection

References: TUGCO Instruction CP-EI-4.0-49, Revision 1 "Evaluation of Thermolag (TSI) Fire Barrier Material on Class IE Electrical Raceways"

Information Needs: Section 2.3 of the referenced instruction indicates that "the Civil/Structural Supervisor is responsible for the implementation of this instruction." Cygna has reviewed calculation packages performed to meet the requirements of this instruction. At the time of this review, the calculations received had not been design reviewed and, in some cases, were not checked. Cygna's review included both calculations for conduit supports (IN-FP calculations) and for cable tray supports.

Please provide copies of the procedures that govern the preparation of the fire protection evaluation calculations. Please provide the procedures which indicate the organizations responsible for preparing, checking, and design reviewing the fire protection evaluation calculations.

Subject: Cable Tray Support Design Computer Models

References: Gibbs & Hill Computer Binder 2323-DMI-5P

Information Needs: Cygna reviewed the stress program outputs referenced for several generic cable tray support designs at Gibbs & Hill's New York offices. In order to complete our cable tray information files and the cumulative effects database, Cygna needs a complete copy of this computer output.

Please provide Cygna with a copy of the referenced computer output.

Subject: Unrefined Spectra for the Design of Cable Tray Support

Information Needs: To complete Cygna's review documentation and provide comparison between the refined spectra used for the design of cable tray supports, please provide a copy of the tables providing unrefined peak spectral values for each building and elevation applicable to cable tray supports.

Subject: Interfaces Between Cable Tray/Conduit Support Design Groups and Others

- References:**
1. Communications Report dated 26 February 1985, 8:30 a.m., "Conduit Review Questions," McBee and Russ participating
 2. Communications Report dated 26 February 1985, 10:30 a.m., "Cable Tray Review Questions," Keiss, Bhujang, and Russ participating

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3. Communications Report dated 20 June 1985, 2:15 p.m., "Conduit Support Interfaces," McBee and Russ participating

Information Needs: In Cygna's design review and walkdown effort, several occurrences have been noted of conduits, conduit supports, and pipe supports attached to cable tray supports, cable tray supports attached to pipe supports, and conduit supports attached to cable tray rails.

Please provide Cygna with the following information and documents regarding the design and installation interfaces between cable tray, conduit, and other design groups:

- a) Procedures controlling the design interfaces.
- b) Procedures and/or methods controlling the transfer of information and loads between design groups.
- c) Procedures which define the responsibility between design groups for shared supports.

Subject: Cable Tray System Dynamic Analysis

- References:**
- 1. Communications Report dated 26 March 1985, "Cable Tray System Dynamic Analysis," Vivorito, Bezkor, et al. participating
 - 2. Communications Report dated 11 April 1985, 10:00 a.m., "Cable Tray Support Dynamic Analysis," Bezkor, Chang, et al. participating

Information Needs: References 1 and 2 provide details of discussions between Gibbs & Hill and Cygna regarding the Cable Tray Dynamic Analysis. In Reference 2, Cygna presented the results of its studies regarding the modeling of members and the tray-support connection. Gibbs & Hill agreed to perform additional evaluations for the impact of certain modeling discrepancies if TUGCO approved. If the subject dynamic analyses are to be used for qualification of cable tray systems, please provide Cygna for the agreed additional evaluations. Among these are:

- a) Evaluation of beam and hanger members for St. Venant shear
- b) Evaluation of brace members for primary member allowables
- c) Weld checks for all analysis models
- d) Documentation of the filtering process used to choose the five systems used for analysis

Subject: Unistrut Testing Program

- References:**
- 1. Communications Report dated 25 February 1985, 8:30 a.m., "Conduit Support Testing," Miller, Kissinger, et al. participating

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2. Communications Report dated 29 March 1985, 9:00 a.m., "Conduit Support Tests," Miller, Yow, et al. participating
3. Communications Report dated 9 April 1985, 9:15 a.m., "Conduit Support Testing," Kissinger, McBee, et al. participating
4. Communications Report dated 9 April 1985, 1:45 p.m., "Conduit Support Testing," Kissinger, McBee, et al. participating
5. Communications Report dated 10 April 1985, 9:00 a.m., "Conduit Support Testing," Kissinger, McBee, et al. participating

Information Needs: References 1 through 5 document the discussions between TUGCO, Gibbs & Hill, and Cygna regarding the Unistrut testing program. If the results of the program are to be used in the qualification of conduit supports at CPSES, Cygna requires the following documents promised by TUGCO/Gibbs & Hill:

- a) Documentation for the screening process performed by Gibbs & Hill to determine the test scope
- b) The final test report for the test scope

Subject: Fire Protection Configuration for Conduits

References: Communications Report dated 18 April 1985, 9:25 a.m., "Conduit Supports," McBee and Leong participating

Information Needs: In the referenced Communications Report, Cygna requested that TUGCO provide the document authorizing the change in fire protection configuration from round to square. This document has not been received to date. Please provide the subject document.

Subject: Corrective Action Documentation for Conduit Support IN-CSM-15a

References:

1. N.H. Williams (Cygna) letter to J.B. George (TUGCO), 84056.020, "Conduit Support Walkdown Questions," dated August 13, 1984
2. L.M. Popplewell (TUGCO) letter to N. Williams (Cygna), transmitting response calculations, dated September 18, 1984

Information Needs: In Reference 1, Cygna described discrepancies noted in the walkdown at CPSES for conduit support IN-CSM-15a. In Reference 2, three corrective action items were identified: (1) grouting of the concrete surface to remove gaps between the base angles and the concrete surface, (2) installation of beveled washers for all Hilti Kwik-bolts, and (3) revised weld calculations.

- a) Please provide Cygna with the revised design drawing: Gibbs & Hill Drawing 2323-S-0910, Sheet IN-CSM-15a, Revision 7.

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- b) Please provide the documentation related to the installation and inspection of corrective action items 1 and 2 discussed above.

Subject: Separation Criteria for Electrical Raceways and Their Supports

References: 1. Brown & Root Instruction QI-QAP-11.1-28, Revision 29, "Fabrication and Installation Inspection of Safety Class Component Supports"
2. Gibbs & Hill Specification 2323-ES-100, Revision 2, "Electrical Erection Specification"

Information Needs: Cygna's walkdowns noted instances where the following have occurred:

- a) A conduit not supported by the support in question was either in contact or in deadweight bearing on the support.
- b) Conduit and cable tray supports were in contact with Class 1 or 2 piping/equipment or its insulation.
- c) An HVAC duct was located 1/4" from an existing cable tray support.
- d) A cable tray support was installed such that the hanger members were placed between two cable trays. Since these trays were covered with Thermolag, Cygna estimated that the distance between the hangers and the trays was approximately 3/4".

Section 3.3.4.2 of Reference 1 specifies clearances between electrical raceways/supports and piping. Basic separation is one inch; however, if the separation cannot be achieved, Electrical Engineering should be notified to issue an unsatisfactory IR. Reference 1 applies to piping installed near existing raceways. For raceways installed near existing piping, Reference 2, Sections 4.3.2, 4.3.5(c), and 4.4.6 apply. The separation requirements in Reference 2 are incomplete when compared to those of Reference 1. Since Cygna has not identified any inspection reports specifying the noted interferences, please provide Cygna with the following information on electrical/mechanical and electrical/electrical interferences:

- 1) The installation requirements for separation of cable tray/conduit and their supports from mechanical equipment and piping, including the QC responsibility for reporting and resolving violations
- 2) The installation requirements for separation of cable trays/conduits and their supports from other cable trays/conduits and their supports, including the QC responsibility for reporting and resolving violations
- 3) The installation requirements for separation of cable trays/conduits and their supports from HVAC and its supports, including the responsibility for reporting and resolving violations

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Subject: Design Review Checklists for Gibbs & Hill Drawings

References: Communications Report dated 5 August 1985, 8:15 a.m., "Cable Tray/Conduit Support Design Review Questions," Huang and Russ participating

Information Needs: As requested in the referenced Communications Report, please provide the design review checklists for all revisions of the following Gibbs & Hill cable tray support plans:

- * 2323-E1-0601-01-S
- * 2323-E1-0700-01-S
- * 2323-E1-0713-01-S
- * 2323-E1-0500-01-S
- * 2323-E1-0500-04-S

Additionally, please provide design review checklists for the following sheets of Gibbs & Hill Conduit Support Drawing package 2323-S-0910:

- o CA-1a, Revision 8
- o CA-2a, Revisions 1 and 5
- o CA-5a, Revisions 16 and 19
- o CA-15, Revision 18
- o CSD-1a, all revisions
- o CSD-2, all revisions
- o CSD-3, all revisions
- o CSD-4, all revisions
- o CSD-16, Revision 3
- o CSM-6b, Revision 3
- o CSM-18b, Revisions 14 and 16
- o CSM-18c, Revisions 12, 13, and 14
- o CSM-18d, Revision 9
- o CSM-18f, Revisions 3, 4, and 5
- o CSM-42, Revisions 11 and 13
- o CSM-3, Revision 0
- o CSM-17, Revision 2
- o JA-1, Revision 2
- o All conduit General Note sheets (G-series), all revisions
- o IN-FP-212, Current Revision
- o IN-FP-213a, Current Revision
- o IN-FP-214, Current Revision
- o IN-FP-216, Current Revision
- o IN-FP-226, Current Revision

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Subject: Installation Tolerance for Richmond Inserts

Information Needs: Cygna's walkdowns noted instances where Richmond Inserts were not installed perpendicular to the concrete surface, such that the bolt heads were not bearing flush on the base angles. Please provide Cygna with the installation procedures and instructions for Richmond Inserts, including any discussions on tolerances.

Subject: Working Point Deviations for Conduit Supports

Information Needs: During the walkdown of conduit line C11004359, Cygna noted working point deviations for conduit support IN-CSM-15b. As a result of working point deviations identified for cable tray supports, was any corrective action instituted for conduit supports? If so, please provide the procedures implemented to address working point deviations for conduit supports.

Subject: Consideration of Previously Issued Change Documentation in Cable Tray Support Designs

Information Needs: Cygna's review has noted instances where the effects of previously issued design change documentation has not been considered in the design of new cable tray supports or the evaluations of existing designs. Please provide the procedures, if any, which specify the requirements regarding the use of the previously issued design change documentation in the design and design review processes.

Subject: Corrective Action as a Result of the Issuance of Gibbs & Hill Specification 2323-SS-30.

Information Needs: Cygna's Cable Tray Review Issue List (RIL) Item 3.E discusses the change in design requirements for Richmond Inserts as the result of the issuance of Gibbs & Hill Specification 2323-SS-30. RIL Item 17.C addresses the design requirements for the usage of embedded strip plates that were specified in the Gibbs & Hill specification. As noted in the RIL descriptions, the specification imposed more stringent requirements than those considered in the original designs of the cable tray supports. Please provide all documentation which addresses the corrective action initiated to assure that any supports installed prior to the issuance of the Gibbs & Hill specification were in accordance with the more stringent requirements.

Subject: Tornado Depressurization Loads on Cable Tray Support No. 3136

References: 1. Gibbs & Hill Calculation 2323-SAB-1341, Set 3, rev. 1

Information Needs: The referenced calculation set contains an analysis of cable tray support no. 3136. This support is located within a fire wall. The revision 0 calculations, which were reviewed by Cygna, did not consider loadings due to tornado depressurization. Subsequently, the calculations were revised and were reviewed by Cygna. This review noted that tornado depressurization loads were considered only

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over the wall area. Pressure loads were not considered over the area occupied by a fire door. Please provide documentation which provides data on the magnitudes of and the methods for considering tornado depressurization loads. If the loading area was properly considered in the revision 1 calculation (i.e., the door area was not loaded, which could only be true if it were open), please provide the documentation which specifies the rationale and the requirement for the fire door to remain open.

Subject: Generic Use of Drawing Specific Cable Tray Support Details

Information Needs: The following cable tray support details appear on the associated Gibbs & Hill support plan drawings and on the design drawings with numbers greater than 0903. It is Cygna's understanding that such details are to be utilized at the elevation of the building that the support plan drawing was prepared for. However, several cases violate this premise (e.g., Details "E", "F", and "H" on Gibbs & Hill Drawing 2323-E1-0601-01-S). Please provide a list of any other buildings and elevations that these cable tray support details may have been used.

<u>Gibbs & Hill Drawing</u>	<u>Support Detail</u>
2323-E1-0500-01-S	"C"
2323-E1-0500-04-S	"A"
2323-E1-0601-01-S	"E", "F", "H", "J", "K", "N", "V", "W"
2323-E1-0700-01-S	"A"
2323-S-0905	11

Subject: Addition of Conduits to Existing Cable Tray Support Details

Information Needs: During Cygna's June 1985 walkdowns, it was noted that conduit supports had been added to cable tray support nos. 2602 (Brown & Root Map Drawing FSE-00176) and 3134 (Brown & Root Map Drawing FSE-00185). These conduit supports were not present during Cygna's July 1984 walkdowns and do not appear on any change documentation in Cygna's possession. Please provide the change documentation, the change verification checklists and any calculations associated with the design review.

Subject: Design Review Documentation for CMC 6186

Information Needs: Cable tray support nos. 758 and 759 (Brown & Root Map Drawing FSE-00176) share a common base angle. This change from the design requirements is documented on CMC 6186. Support 758 is within the Cygna review scope. The CMC only lists support no. 759 in the affected component block. Therefore, when retrieving the design review documentation for all in-scope supports, Cygna did not request the CVC and any associated calculations for this CMC. Please provide the design review documentation and any pertinent calculations for all revisions of CMC 6186.