RELATED CORRESPONDENCE

C A S E

(CITIZENS ASSN. FOR SOUND ENERGY)

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Dallas, Texas 75224

214/946-9446

DOCKETED

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March 11, 1983

Mr. Nicholas S. Reynolds, Esq.
Debevoise & Liberman
1200 - 17th St., N. W.
Washington, D. C. 20036

Dear Nick:

Subject: Application of Texas Utilities Generating Company, et al. for an Operating License for Comanche Peak Steam Electric Station Units #1 and #2 (CPSES)

Sorry we weren't able to make contact with you yesterday. However, Bill Horin returned our call this morning and we discussed everything with him.

As we indicated in that conversation, since there are many documents which we would like to have under the informal discovery which the Board is allowing, we have made a list (see attached) so that you will have it in front of you when we talk about this.

Another item which we mentioned and which Bill indicated that he would check out for us is regarding Applicants' Exhibit 148 (the Draft ANSI N45.2.11); the copy we have contains pages 1 through 31 and we just wanted to be sure that there were no additional pages and that we had or could quickly get the rest if there are others. (You might also need to check with the Staff, the Board and the Court Reporter if there are additional pages, just to be sure they have a complete set.)

On the attached list, you will notice that item 3 requests the design procedures, criteria, and guidelines for NPSI, ITT Grinnel and Gibbs and Hill. We believe we are on firm ground in requesting these documents, since the Staff refers to them in their I&E Report 82-26/82-14 on the Walsh/Doyle allegations. We note that the February 15, 1983, cover letter to I&E Report 82-26/82-14 included the usual provision for Applicants to notify the NRC if anything contained in the I&E Report was of a proprietary nature pursuant to 10 CFR 2.790. Since there is no indication that Applicants filed pursuant to that provision, we believe this information should be supplied to us as part of the informal discovery provided for by the Board in its 3/8/83 conference call. Further, at this time there is no sworn statement by Applicants that the NPSI and ITT Grinnel design criteria are proprietary information; and the Board noted in its January 4, 1983, Memorandum and Order that the Board does not consider representations by counsel as constituting evidence.

We certainly hope that we can work out the details so that you can supply the documents we need in a timely manner and thereby avoid our having to involve the Board in this matter.

Sincerely,

Juanita Ellis

(Mrs.) Juanita Ellis
President

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PDR ADOCK 05000445
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cc: Service List

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NRC/Applicants (as applicable)

Please provide the following documents immediately:

1. The self-evaluation and implementation of design and engineering criteria performed under the auspices of the Institute for Nuclear Power Operations (INPO) which was completed, then provided to NRC Region IV in January, 1983.

2. All notes, memoranda, and other written communications (letters, etc.) developed prior to, during, or in response to all special inspections conducted by the SIT team at: (a) the Comanche Peak facility, (b) Gibbs & Hill in New York City, (c) Nuclear Power Services, Inc. (NPSI) in Secaucus, New Jersey, and (d) the Region IV NRC offices.

3. The design procedures, criteria, and guidelines for each of the three CPSES design groups: NPSI and ITT-Grinnell and by Gibbs & Hill. (Including but not limited to the required design review procedures.) These should include all revisions/editions in use from January 1, 1982 through the present.

4. Applicant's engineering instruction Nol CP-EI-4.6-9, entitled "Performance Instruction for SSAG," revision 0, dated September 5, 1980.

5. Applicant's engineering instruction No. CP-EI-4.6-9, "Performance Instruction for SSAG," revision 1, dated August 3, 1981.

6. Applicant's CP-EP-2.1 "General Program for Pipe Support Design, Fabrication and Installation Activities."

7. CP-EI-4.0-4, "Field Structural Engineering Group Design Control Instruction."

8. CP-EI-4.0-1, "Design and Design Verification Control for Pipe Support Engineering."

9. CP-EI-4.0-13, "Control of Stress Analysis for Pipe Support Engineering."

10. CP-EI-4.5.4, "Technical Services Engineering Instruction for Pipe Hanger Design Review."

11. NRC Regulatory Guide 1.28.

12. NRC Regulatory Guide 1.64.

13. Gibbs & Hill Specification MS-46A.

14. Applicant's letter dated December 21, 1981 which provides the correspondance matrix regarding orders CP-0046A (ITT-Grinnell) and CP-0046A.1 (NPSI).

15. CP-EP.1, "General Program for Pipe Design, Fabrication, and Installation."

16. Gibbs & Hill instructions, entitled "As Built Verification Instruction, " Revision 2, dated June 7, 1982.

17. TUSI Engineering Instruction CP-EI-4.5-1, "General Program for As-Built Piping Verification," Revision 6, dated August 30, 1982.

18. Gibbs & Hill Specification 2323-SS-30, "Structural Embedments," March 19, 1981.

19. Gibbs & Hill Report, "Evaluation of LOCA Temperature Effects on Pipe Supports," August 26, 1982.

20. NPSI Report, "Load Transformation Study on Richmond Insert & Tube Steel Assemblies, "September, 1982.

21. PSE Guidelines, Section V, "Hilti Concrete Anchor Bolts."

22. PSE Guidelines, Section VI, "Richmond Inserts and Anchor Bolts Stress Allowables."

23. TUGCO Procedure CP-HBM-0.1, "Hilti Bolt Inspection Manual," Revision 31.

24. Polytechnic Institute of Brooklyn Test Reports for Richmond Screw Anchor Company.

25. PSE Report, "Richmond Inserts--Prepared for 1/17/83 meeting with NRC.

26. The evaluation/analysis (including any and all calculations) for the worst-case analysis of an eleven-foot long member under LOCA conditions using available load-displacement data, performed by the SIT.

27. The evaluation/analysis (including any and all calculations) for the shear cone analysis made by Applicant regarding the allowable Richmond anchor tension loads (page 19 of I&E 82-26/82-14).

28. Appendix B of the American Concrete Institute's (ACI) "Code Requirements for Nuclear Safety-Related Concrete Structures, "ACI 349-76.

29. Richmond Screw Anchor Company Bulletin No. 6 (for allowable loads).

30. All documentation (memoranda, letters, calculations, etc.) for the Applicant's statement (reported on Page 19 of I&E 82-26/82-14) that the manufacturer of Richmond Inserts has "indicated that a factor of safety of less than three has on occasion been recommended in the concrete precast tilt-up industry."

31. All documentation (memoranda, notes, letters, calculations, etc.) done by SIT in reviewing the manufacturer's data published in reference 24 above.

32. ACI 349-80, "Code Requirements for Nuclear Safety-Related Concrete Structures."

33. All test modeling and test data available in reference to the Richmond safety factor used by Applicants.

34. American Society for Testing and Materials (ASTM), "Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements," ASTM E488-76.

35. All documentation, user guides, code/meaning lists, etc. necessary to properly comprehend the load transformation behavior of a typical insert and tube steel configuration based on a finite element model analysis using the STARDYNE computer code. (E.g., the STARDYNE computer code and how to use it.)

36. All documents (notes, memoranda, letters, calculations, etc.) for the five load cases which were analyzed for tension, shear, and moment--cases which represented midspan axial unit loading along the three principal axis of the tube steel. (Cf. I&E 82-26/82-14, page 21). (These were done by SIT?)

37. All documentation (notes, memoranda, letters, calculations, etc.) done by the SIT in evaluating the stresses in the bolt due to the offset. (Cf. I&E 82/26-82-14, page 21).

38. All documentation (notes, memoranda, letters, calculations, etc.) for the preliminary calculations done by Applicant indicating that "bending moments are insignificant in all but one of 60 cases reviewed." (I&E 82-26/82-14, page 22.)

39. All documentation (notes, memoranda, calculations, letters, etc.) done by SIT on the ability of Richmond Insert/tube steel assembly to resist axial torsion. (I&E 82-26/82-14, page 22.)

40. All documentation (notes, memoranda, letters, calculations, etc.) done by SIT in their evaluation of the eccentricity between the tube steel and the Richmond Insert. (I&E 82-26/82-14, page 22.)

41. NRC Bulletin 79-02.

42. All documentation on the Applicant's testing program (notes, reports, memoranda, calculations, etc.) conducted on-site with the assistance of Hilti Fastening Systems, Inc., in order to establish torque requirements and to respond to NRC Bulletin 79-02. (I&E 82-26/82-14, page 23.)

43. All documentation (notes, memoranda, calculations, letters, etc,) in reference to Applicant's report that factors of safety between 3 and 71 of the ultimate deflections are reported. (I&E 82/26-82/14, page 24.)

44. All documentation (calculations, notes, memoranda, etc.) used by the SIT to arrive at their conclusion on page 24 of I&E 82/26-82/14 that the ASME Code does not require that differential thermal expansion effects resulting from LOCA conditions in pipe support members be included in the design of linear type pipe supports which are covered by the ASME Code.

45. All documentation (calculations, notes, memoranda, etc.) used by the SIT to arrive at their conclusion on page 24 of I&E 82/26-82/14 that differential thermal expansion effects resulting from LOCA conditions within pipe support members which are bolted to concrete structures will be reduced due to the flexibility of the anchor connection.

46. ITT-Grinnell Design Guidelines Section IV, Paragraph 18.0.

47. Applicant's analyses of LOCA thermal expansion effects in: (1) The floor-to-ceiling support No. SW-1-132-701-Y33R, (2) the floor-to-wall moment restraint shown on Drawing No. 2323-SI-0538-07, and (3) the wall-to-wall steam generator upper lateral restraint. (Including notes, memoranda, and calculations.)

48. TUSI Engineering Guidelines, Section II (regarding the effects of differential seismic displacements--I&E 82/26-82/14 page 25)and all other sections.

49. ITT-Grinnell and NPSI guidelines relating to the effects of differential seismic displacements, and all other sections.

50. Applicant's memorandum to ITT-Grinnell and NPSI personnel to use the same seismic guidelines as those contained in the TUSI Engineering Guidelines (dated January 19, 1983).

51. All documentation (notes, calculations, memoranda, etc.) relating to the evaluations of the floor-to-ceiling service water supports identified by Mr. Walsh--evaluations being done by PSE.

52. All documentation (notes, calculations, memoranda, etc.) by means of which Applicants informed the SIT that these supports (referenced in 51.) would be unable to withstand differential seismic displacements and were being redesigned.

53. All documentation (notes, calculations, memoranda, etc.) available on the redesign of the supports referenced in 51 by Applicants (PSE or their other subcontractors--e.g., NPSI or III-Grinnell).

54. CMC 46174, Revision 8 and all prior revisions.

55. CMC 46730, Revision 4 and all prior revisions.

56. All documentation (notes, calculations, memoranda, etc.)including Applicants' analyses, which SIT reviewed in determining the adequacy of the floor-to-wall moment restraint shown on Drawing No. 2323-SI-0538-07 and the wall-to-wall steam generator upper lateral restraint to withstand differential seismic displacements.

57. All documentation (notes, calculations, memoranda, etc.) used by SIT in performing its review of the effects of concrete creep displacement in the floor-to-ceiling service water supports identified by Messrs. Walsh and Doyle.

58. All documentation (notes, calculations, memoranda, etc.) used in arriving at and documenting the design modification prompted by the concern of Mr. Doyle about seismic displacement effects. (I&E 82/26-82/14, page 27.)

59. All documentation (notes, memoranda, etc.) which delineates the procedures which are in place to assure that seismic displacement effects will be considered in the design of other pipe supports which may be affected. (I&E 82/26-82/14, page 27.)

60. All documentation (analyses, texts, etc.) used by SIT to conclude that it is not general industry practice to explicitly address the overall stability of piping systems together with their supports in design guidelines. (I&E 82/26-82/14, page 28.)

61. All documentation (analyses, texts, etc.) used by SIT to conclude that it is standard industry design practice to address only the structural integrity of supports in design guidelines.

62. All documentation (analyses, texts, etc.) used by SIT to conclude that industrial experience has shown in the case of non-rigid pipe supports that if the support element which attaches to the pipe is prevented from rotating about the axis of the supported pipe at all times, the piping system and its supports will be a stable mechanical system. (I&E, 82/26-82/14, page 28.)

63. All documentation (notes, memoranda, analyses, texts, calculations, etc.) used by SIT to conclude that frictional forces are sometimes relied upon to prevent rotation of the support element about the axis of the supported pipe--e.g., in the case of pipe clamps or U-bolts.

64. All documentation (notes, calculations, memoranda, etc.) reviewed by SIT to confirm that the Applicant has indeed begun to assess the stability of non-rigid box frame supports, in addition to all such documentation that SIT reviewed which indicates that such supports will be reassessed for stability.

65. All documentation (notes, calculations, memoranda, etc.) reviewed by SIT or in the possession of Applicant which delineate which design modifications are under consideration by Applicants which are intended to prevent rotation of the box frame around the axis of the supported piping including (but are not limited to): (1) the use of a U-bolt that is fixed to the box frame and cinched down to the pipe; (2) lugs welded to the pipe that will be indexed to the box frame, and (3) the addition of stabilizing struts to the box frame.

66. All documentation (notes, calculations, memoranda, etc.) relied upon by SIT in discussions with Applicant about the assurance of the stability of non-rigid U-bolt supports. (I&E 82/26-82/14, page 29).

67. All documentation (notes, memoranda, calculations, etc.) relating to Gibbs & Hill's identification of Mr. Doyle's concern (I&E 82/26-82/14, page 29) on the use of U-bolts in pipe support design, including (but not limited to) all documentation of the review procedures established in a Gibbs & Hill office memorandum dated July 16, 1892.

68. Gibbs & Hill Specification MS-200.

69. All documentation (notes, memoranda, calculations, etc.) including the "other procedures" instituted by Applicant in this regard (item 68). (I&E 82/26-82/14, page 30.)

70. All documentation (notes, memoranda, calculations, etc.) relied on by SIT during "subsequent discussions with the Applicant" (I&E 82/26-82/14, page 30) that all one-way U-bolt supprts in which the initial thermal expansion analysis indicated a movement in the U-bolt lateral direction greater than 1/16 inch were modified to accomodate the calculated lateral movement or were replaced.

71. All documentation (NCRs, CMCs, calculations, etc.) developed by Applicant in arriving at the movement indicated in item 70 above, as well as all documentation relating to the modifications and/or replacement of each and every support so modified and/or replaced, as well as for those supports which still are under and/or to be reviewed to assess the potential for such modification and/or replacement.

72. Copies of all examples of the modification materials reviewed by SIT in this regard (item 70 and 71.).

73. All documentation (notes, memoranda, calculations, etc.) relied on by SIT in "subsequent discussion with Applicants" of Applicants' presentation to SIT of seismic displacement data at selected one-way U-bolt restraints.

74. A list of all selected one-way U-bolt restraints chosen by Applicants for the presentation to SIT (item 73) and any documentation (notes, memoranda, calculations, etc.) relating to the criteria(s) used to select these specific U-bolt restraints for presentation to SIT.

75. All documentation (notes, calculations, memoranda, etc.) used to indicate that the displacements were less than about 1/32 inch. (See item 73 and 74).

76. All documentation (notes, calculations, memoranda, etc.)comprising the analyses performed by SIT(relative to the neglect of constraint effects when the original thermal expansion analyses indicated piping movements less than 1/16 inch in the U-bolt lateral direction- I&E 82-26/82-14, page 30)regarding: (1) piping stresses due to restraint of up to 1/16 inch of this type of thermal movement are negligible for all pipe sizes, and (2) lateral loads on the U-bolts due to thermal expansion movements of this type of up to 1/16 inch are negligible for all pipe sizes when the relative flexibilities of the pipe and U-bolts are considered (page 30 and 31 of I&E 82/26-82/14).

77. All documentation (notes, calculations, memoranda, etc.) reviewed by SIT of a related Gibbs & Hill concern regarding the use of U-bolts in rigid supports as "two-way" restraints. (I&E, 82/26-82/14, page 31.)

78. All documentation (notes, calculations,etc.)reviewed or presented during "subsequent discussions with the Applicant (I&E 82/26-82/14, page 31) in which SIT was informed by Applicant that U-bolts are not used on two-way rigid supports for pipe sizes larger than 6 inches. (Include all documentation (notes, etc.) of how the SIT verified such usage.)

79. The Gibbs & Hill study on lateral stiffness in U-bolt attachments that the SIT was shown regarding lateral stiffness values of U-bolts for pipe sizes 6 inches and under are comparable to the generic stiffness values used in the pipe stress analysis.

80. All documentation (notes, calculations, memoranda, design guidelines, etc.) delineating the instructions to support design groups (all such groups) to verify that the loads on the support are within the U-bolt manufacturer's allowable loads during the as-built verification program. (I&E 82/26-82/14, page 31.)

81. All documentation (notes, calcuations, memoranda, etc.) utilized/presented during, etc. the "discussion with cognizant engineers" that U-bolt deformations have not been included by Applicant in its support deflection calculations.

82. Brown and Root Design Change Notice (DCN) Number 1, dated 10/8/82 to Construction Procedure No. 35-1195-CPM 9.10 Rev. 8.

83. Brown and Root Construction Procedure No. 35-1195-CPM 9.10 Rev. 8 in its entirety.

84. All documentation (notes, calculations, memoranda, etc.) presented and/or reviewed by SIT in "subsequent discussions with Applicant" (I&E 82/26-82/14, page 32) where Applicant informed SIT that U-bolts will be field-verified to confirm that they are properly tightened.

85. All documentation (notes, memoranda, calculations, etc.) comprising the review of design temperatures and pipe size of uninsulated piping done by SIT which indicated that a maximum radial growth of the piping is expected to be less than 1/32 inch. (I&E 82/26-82/14, pages 32-33.)

86. All documentation (notes, calculations, memoranda, etc.) used by SIT and/or Applicant to arrive at the expectation that the maximum temperature differential between the U-bolt and the pipe in uninsulated piping will be less than 50 degrees Fahrenheit.(I&E 82/26-82/14, page 33)

87. All calculations performed by SIT which indicated that the associated secondary stresses and loads are negligible relative to ASME Code allowables.

88. All documentation (notes, calculations, etc.) used to arrive at the conclusion that the U-bolt is normally provided with a 1/16 inch diametrical gap on the pipe to facilitate its installation and that even after cinching down, there is not full circumferential contact between the U-bolt and the pipe.

89. All documentation (calculations, notes, memoranda, etc.) presented by and/or reviewed by SIT of the "relevant cognizant engineers" discussion that it was an undocumented Gibbs & Hill design recommendation, where U-bolts or box frames are in direct contact with the supported pipe, that clearances be provided between the U-bolts or box frames and the supported pipe only if the diametrical growth of the pipe exceeds 1/32 inch at design temperatures. (I&E 82/26-82/14, page 33.) (Include also all documentation regarding Applicant's assertion that such guideline was not applied to U-bolts.

90. All documentation (calculations, notes, etc.) comprising the ITT-Grinnell guidelines which relate to the undocumented Gibbs & Hill recommendation referenced in item 89 above.

91. All documentation (notes, etc.) of the verification by SIT of the Applicants statement that only low temperature systems used box frames.

92. All documentation (notes, memoranda, etc.) delineating that Mr. Doyle's concern about the restraint of U-bolts of lateral movement of the pipe due to thermal expansion at one-way restraint points, and his concern about the preloading stresses have been identified in the course of Applicant's normal review program --and that these have been rectified.

93. All documentation (all guidelines, memoranda, etc.) which SIT used and/or Applicants aver show that seismic accelerations are considered by PSE in the design of small bore piping.

94. All documentation (all calculations, notes, memoranda, guidelines, etc.) from NPSI and ITT-Grinnell which show that these groups consider the seismic acceleration load of the supports themselves to be relatively low for large bore piping. (I&E 82/26-82/14, page 34.)

95. A complete listing of the 400 "randomly-selected" (by Applicant) supports refered to on page 34 and 35 of I&E 82/26-82/14.

96. A complete listing of the 23 "worst-case" supports and the detailed analyses performed on each one by Applicants. (I&E 82/26-82/14, page 35.) (Please provide all analyses--and the entirety of each analysis (e.g., calculations, drawings, etc.)

97. The reanalyses performed by NPSI on 13 supports in which the seismic acceleration loads had been neglected by NPSI in the original design--a complete copy of each analsis (with calculations, etc.) and a listing of the supports thus re-analyzed. (Page 35.)

98. All documentation (notes, calculations, memoranda, etc.) comprising the SIT's detailed evaluation of the calculations performed by both PSE and NPSI. (This documentation should include (but not be limited to) all documentation reviewing the modeling techniques, design criteria, analytical assumptions, computer programs and hand calculations, as well as all documentation relied upon or produced during discussions held with individuals in the PSE, ITT-Grinnell, and NPSI design groups.)

99. The design criteria adopted by PSE, ITT-Grinnell, and NPSI to ensure the rigidity of the supports (I&E 82/26-82/14, page 36).

100. All documents (notes, calculations, memoranda, etc.) used by SIT to assess the magnitude of the excluded load. (I&E 82/26-82/14, page 17).

101. All documents (notes, calculations, memoranda, design guidelines, etc.) comprising the Applicant's design criteria with factors of safety (I&E 82/26-82/14, page 17.)

*102. All documents (notes, calculations, memoranda, etc.) arising from or presented during interviews held by SIT with "cognizant engineers"--including all calculation reviews--on Applicant's not having considered LOCA thermal expansion effects on concrete inserts and bolts in the design of individual pipe supports and associated concrete anchors. (I&E 82/26-82/14, page 17.)

103. The study which Applicant is providing (if available) which demonstrates the adequacy of its guidelines to assure a rigid support design. (I&E 82/26-82/14, page 36.)

104. The listing of the 100 randomly selected supports referred to on page 36 of I&E 82/26-82/14 --and all documentation (notes, calculations, memoranda, etc.) which SIT reviewed and/or developed during its review of them in order to arrive at the conclusions that: (1) NPSI criteria have been adhered to; (2) deflection limits have been maintained in support design, and (3) the seismic

acceleration loads of the supports are likely to remain negligible.

105. All documentation (calculations, notes, memoranda, etc.) arising from or presented for SIT's review of the effect of support loads on pipe stresses during a seismic event--especially that pertaining to the SIT's evaluation of the torsional effect. (I&E 82/26-82/14, page 36.)

106. All documentation (notes, calculations, memoranda, etc.)comprising the Applicant's analysis of the supports (Doyle Deposition Attachments 12E through 12N) and the procedures used by Applicant to include the effect of the support load on the pipe--all of which was reviewed and evaluated by SIT. (I&E 82/26-82/14, pages 36-37.)

107. All documentation (notes, memoranda, guidelines, etc.) used by SIT to determine that an assessment of this contribution (see items 105 and 106) to the piping load is made on a case-by-case basis by both Gibbs & Hill and Westinghouse pipe stress analysis groups.

108. All documentation (notes, guidelines, memoranda, etc.) comprising the source material for the chart on page 37 of I&E 82/26-82/14.

109. All documentation (notes, memoranda, calculations, etc.) comprising the SIT's investigation of the torsional e-fect of the eccentric support load on the pipe stresses. (I&E 82/26-82-14, page 37.)

110. All documentation (guidelines, memoranda, etc.) reviewed by SIT and/or provided by Applicant which SIT used to find that in practice the Applicant includes the weight of the support in the pipe stress analysis if the support weight exceeds a small percentage of the support pipe weight. (I&E 82/26-82/14, page 37.)

111. Memorandum: D.L. Rencher to ITT, NPSI TSDRE's, Stress Analysis of Welded Attachments, TSBR #V92, April 7, 1982.

112. All documentation (calculations, notes, memoranda, guidelines, etc.) of all discussions, meetings, etc. held by SIT with Gibbs & Hill personnel on October 27, 1982. (I&E 82/26-82/14, page 38.)

113. Gibbs & Hill Stress Problem AB-1-03 dated August 23, 1982.

114. All documentation (calculations, notes, memoranda, etc.) developed by SIT in reviewing item 113 above, including all documentation on the review of the supports listed at the top of page 39 of I&E 82/26-82/14.

115. Gibbs & Hill Specification 2323-MS-200.

116. All documentation (calculations, notes, memoranda, etc.) developed or presented during "subsequent discussions" with Applicant which indicated that this rotational restraint had also been identified during Applicant's normal design review.

to SIT

117. All documentation provided or possessed by Applicant (notes, memoranda, etc.) that indicates that the problem referenced in item 116 above had already been identified during Applicant's design review process.

118. All documentation provided to SIT and/or possessed by Applicant regarding the modifications of the pipe stress analysis which is being done to consider this rotational restraint. (This should include, but not be limited to, all memoranda, calculations, etc.)

119. Memoranda entitled, "Minutes of discussion at the Meeting between G&H and NPSI on March 17, 1982," (I&E 82/26-82/14, page 39.)

120. All documentation (notes, memoranda, calculations, etc.) produced or provided during SIT's evaluation of item 119 above.

121. All documentation (notes, calculations,memoranda, etc.) comprising Applicant's evaluation of local pipe stress effects in their As-Built Verification program where appicable--due to radial and shear loads and moments. (I&E 82/26-82/14,page 39).

122. The CYLNOZ 2 computer program which Applicant utilized for its local stress evaluations referenced in 121 above.

123. Instructions for interpeting the CYLNOZ 2 comupter program identified in item 122 above. (This should include, but not be limited to, all necessary coding information, etc. provided to Applicant by Franklin Institute.)

124. Welding Research Council (WRC) Bulletin No. 107, " Local Stresses in Spherical and Cylindrical Shells due to External Loadings, " dated August, 1975.

125. All documentation (notes, calculations, memoranda, etc.) produced by SIT and used to arrive at the conclusion that the use of CYLNOZ 2 computer program is an acceptable method of analyzing local stresses. (I&E 82/26-82/14, page 39.)

126. All documentation (notes, memoranda, calculations, etc.) comprising Applicant's calculations of local pipe stresses, showing that these local pipe stresses were combined with internal pressure and ALDPIPE bending stresses at these support locations in accordance with the criteria in Equations 8, 9, and 11 of NC-3650 of the ASME Code, Section III, Subsection NC.

127. ASME Code, Section III, Subsection NC.

128. All documentation (notes, memoranda, calculations,etc.) either provided by Applicant and/or developed by SIT which show that the criteria (referred to in item 126 above) were satisfied at all five support locations on the main steam pipe.

129. All documentation (notes, memoranda, calculations, etc.) referenced by Applicant in "subsequent discussions" (I&E 82/26-82/14, page 40) with SIT in regard to the differential thermal expansion effects for support No. MS-1-003-009-C72K. (Open Item No. 50-445-8226-5.)

130. All documentation (texts, guidelines, etc.) used by SIT in arriving at the conclusion that in computing the response of a piping system to complex

loading combinations such as those which include a seismic event, it is important to assure that piping supports are sufficiently stiff so that they do not adversely affect the response of the piping system.

131. The generic stiffness values used by Applicant in its calculations of piping system response. (I&E 82/26-82/14, page 40.)

132. All documentation (notes, memoranda, etc.) provided by Applicant and/or developed by SIT in "discussions with the Applicant" (I&E 82/26-82/14, pages 40-41) regarding the 1/16 inch deflection guideline, etc.

133. The study which Applicant promised to provide which will demonstrate that supports designed in accordance with Applicant's criteria and guidelines have sufficient stiffness to assure that they do not adversely affect the response of the piping system. (I&E 82/26-82/14, page 41/)

134. The "vendor certified" drawings, calculations, etc. for Component Cooling Water support No. CC-1-107-008-E23R (Doyle, Attachment 11TT), done by ITT-Grinnell.

135. All documentation (test results, calculations, etc.) relating to the tests performed by Applicant on this support (referenced in item 134 above) under service level B conditions.

136. All documentation (test results, computer runs, calculations, etc.) comprising the rerun of the piping stress problem on this support (referenced in item 134 above) which was promised by Applicant's to SIT. (I&E 82-26/ 82-14, page 41.)

137. All documentation (calculations, notes, memoranda, etc.) done by SIT which comprise the calculations which indicated that the maximum deflection on Component Cooling Water support No. CC-2-008-709-A43K may exceed the Applicant's 1/16 inch maximum deflection guideline, but that the 3/16 inch weld was not found to be overstressed.

138. All of the preliminary calculations reviewed by SIT which were provided by the Applicant covering the displacements and local stresses for this support.

139. All documentation (notes, calculations, memoranda, etc.) which were presented during or were produced during later discussions with Applicant which indicated that its subsequent review has also identified an over-stress problem in this support.

140. The status report which Applicant has promised to provide (I&E 82/26-82/14, page 42) on the status of this support design. (Open Item No. 50-446/8214-4).

141. Regarding Chemical Volume and Control System support No. CS-1-239-007-A42R (I&E 82/26-82/14, page 42), all documentation used by SIT to determine that the plate thickness was originally specified to be 1 inch.

142. Component Modification Card (CMC) No. 58004, dated June 11, 1982.

143. All documentation (notes, memoranda, etc.) in Applicant's possession which was presented to SIT in discussions with them (I&E 82/26-82/14, page 42) regarding the "routine practice" for the support reviewers of all three pipe support design groups to consider these local effects in the design of pipe supports and in the review of such designs.

144. The examples which SIT reviewed (complete examples) of cases in which local effects have been considered in its inspection of vendor certified supports described in Paragraph 4.

145. The two instances cited on page 42 of I&E 82/26-82/14 in which Mr. Doyle's concerns about excessive deflections in certain supports had also been identified by the Applicant's design review program, delineating which problem has been rectified and which is to be rectified by redesign.

146. The two additional studies (I&E 82/26-82/14, page 43) which Applicant has promised to provide to SIT: Open Items Nos. 50-445/8226-6 and 50-446/8214-5 --a study providing assurance that the Applicant's design criteria and guidelines provide sufficient stiffness to the supports, and Open Items No. 50-445/8226-7--a pipe stress analysis providing assurance that support NO. CC-1-107-008-E23R has sufficient stiffness to perform satisfactorily.

147. The three design groups guidelines (PSE, NPSI, and ITT-Grinnell) regarding the SIT's consideration of Mr. Walsh's concern on friction loads (I&E 82/26-82/14, pages 43-44.) (Please provide the entire document for each group.)

148. The Gibbs & Hill pipe stress problem for the main steam and feedwater lines which was reviewed by SIT regarding the inclusion of "kick-load" force. (I&E 82/26-82/14, page 44.)

149. All documentation (notes, calculations, memoranda, etc.) provided to or produced by the SIT in arriving at its conclusion that the inclusion of kick-load force in supports with as-built misalignment of 5 degrees or more.

150. All documentation (notes, calculations, memoranda, etc.) provided to SIT and/or produced by it during "subsequent discussions with the Applicant" during which SIT was informed that a "similar procedure" was employed for all other Class 2 and 3 piping.

151. All documentation (notes, memoranda, calculations, etc.) utilitzed and/or produced by SIT during its review of a stress problem for the boron recycle system. (I&E 82/26-82/14, page 45.)

152. The stress problem for the boron recycle system reviewed by SIT (referenced in item 151 above).

153. ITT-Grinnell Procedure RP-2 (I&E 82/26-82/14, page 45).

154. All documentation (notes, memoranda, calculations, etc.) produced by SIT in determining that the procedure referenced in item 153 above provides guidelines for STRUDL modeling when investigating web bending in wide

flange structural members subject to certain well-defined support configurations. (I&E 82/26-82/14, page 45.) (Please also include all documentation produced by SIT in arriving at the conclusion on page 46 of the I&E report referenced above, that the bases of the torsional constant indicated therein are conservative.)

155. The "subsequent calculations" of shearing stresses referred to in this discussion (see item 154 above), utilizing AISC torsional constant values.

156. The American Institute of Steel Construction (AISC) torsional values tables (etc.), referred to by SIT in items 154 and 155 above.

157. All documentation (guidelines, memoranda, etc.) possessed by Applicant which indicates that all tube steel utilized in the design of pipe supports is designated as ASTM A-500-Grade B steel having a minimum ductility requirement expressed as minimum elongation in a 2-inch length of 23 percent. (I&E 82/26-82/14, page 46.)

158. "Structural Behavior of Thick Cold-Formed Steel Members," by W.W. Yu, A.S. Liu and W.M. McKinney, November, 1974.

159. "Suggested Steel Ductility Requirements," by A.K. Dhalla and G. Winter, February, 1974. (I&E 82/26-82/14, page 47.)

160. "Steel Ductility Measurements," by A.K. Dhalla and G. Winter, February, 1974.

161. "Corner Properties of Cold-Formed Steel Shapes," by K.W. Karren, February 1967.

162. "Effects of Cold-Straining On Structural Sheet Steels," by A. Chajes, S.J. Britvec, and G. Winter, April, 1963.

163. "Effects of Cold-Forming on Light-Gage Steel Members," by K.W. Karren, and G. Winter, February, 1967.

164. The Westinghouse seismic piping analyses using codes ADAYAPQ and ADAYAPS for Stress Problem 1-41 reviewed by SIT (I&E 82/26-82/14, page 48).

165. All information necessary to properly interpret the ADAYAPQ and ADAYAPS code and Stress Problem 1-41 referenced in item 164 above.

166. All additional documentation (notes, analyses, computer runs, calcuat etc.) used by SIT and/or produced by SIT in its evaluation of the se analysis inputs for the upset operating condition, the emergency, faulted operating condition.

167. The Safe Shutdown Earthquake (SSE) response spectra referred in its review (see I&E 82/26-82/14, page 48)--the actual re used as inputs.

168. The PSE guidelines being utilized for the design of integral stanchions on pipes which SIT reviewed. (I&E 82/26-82/14, page 49.)

169. All documentation (notes, memoranda, guidelines, etc.) used by Gibbs & Hill in its analysis of local effects due to integral attachments (i.e., its pipe stress analysis which uses the CYLNOZ 2 computer code).

170. The representative examples of this analysis reviewed by SIT during its inspection at Gibbs & Hill (referenced in item 169 above).

171. All documentation (notes, calculations, memoranda, etc.) developed by the SIT during and as a result of its review of the analyses referenced in item 170, which led to its conclusion that the Gibbs & Hill stress analysis techniques are acceptable.

172. The analytical evaluations reviewed by SIT in considering the adequacy of the design of perpendicular tube-to-tube welded connections (I&E 82/26-82/14, pages 49-50) and all other documentation reviewed by SIT in this matter.

173. "Finite Element Analysis of RHS (Rectangular Hollow Section) T-Joints," by R.A. Korol and F.A. Mirza, September, 1982.

174. All documentation (notes, calculations, drawings, etc.) which SIT used to arrive at its conclusion that the designs for RHS T-joint designs reviewed at CPSES are similar to designs shown by Korol and Mirza (see item 173 above).

175. All documentation (NCR's, etc.) which SIT evaluated and/or reviewed to arrive at its determination (I&E 82/26-82/14, page 50), that support No. CC-1-045-026-A33R has never been issued, and why it was not.

176. All documentation (notes, calculations, etc.) comprising SIT's review of the design drawings of support Nos. SI-1-031-704-A32R and MS-1-029-039-S63R with respect to minimum fillet weld requirements of Appendix XVII of the ASME Code.

177. All documentation (notes, memoranda, calculations, etc.) concerning the 15 support drawings for CPSES by NPSI which specified fillet welds not in accordance with ASME Appendix XVII requirements which were identified by the NRC in its inspection of NPSI (Nuclear Power Services, Inc.) on November 17-20, 1981.

178. The fifteen support drawings referenced in item 177 above.

179. The internal design audit performed by NPSI in response to this finding (see item 177 above), which identified 382 supports which did not meet the requirements of the ASME Code for minimum fillet weld size. (I&E 82/26-82/14, page 51).

180. All Component Modification Cards (CMC's) which were subsequently issued to modify all welds not meeting code requirements (I&E 82/26-82/14, page 51).

181. The representative sample of the documentation which defines and resolves the undersized welds identified during the inspection at NPSI (I&E 82/26-82/14, page 51), reviewed by a SIT independent review.

182. The procedures utilitized by the three pipe support groups at CPSES (PSE, ITT-Grinnell, and NPSI) for the design of fillet welds at skewed joints (skewed welds)--all of which were reviewed by the SIT during the inspection (I&E 82/26-82/14, page 51).

183. All documentation (notes, calculations, guidelines, etc.) comprising Applicant's past and current reinspection program of skewed welds in supports utilizing newly developed inspection criteria--being done in response to NRC I&E No. 50-445/82-14, Unresolved Item No. 8214-02. (I&E 82/26-82/14, page 51.)

184. The newly developed inspeytion criteria referred to in item 183.

185. All documentation (notes, memoranda, etc.) in addition to the calculations developed by SIT of the stiffness and stress on a cantilever beam to assess the true generic impact of the section variations. (I&E 82/26-82/14, page 52.)

186. AISC Manual of of Cold Form Welded Structural Steel Tubing (1974), member property values in particular.

manual

187. AISC, 7th edition member property values in particular.

manual

188. AISC, 8th edition, member property values in particular.

189. All documentation (notes, guidelines, memoranda, calculations, etc.) comprising Applicant's past and present re-examination of all large bore and Class 1 small bore pipe support designs using the member property values in the 8th edition of the AISC manual.

190. All documentation (notes, etc.) comprising the calculations which made SIT determine that the actual variations in stress levels will not exceed 8 percent and that the differences in section property values for small bore Class 2 and 3 supports are less than 8 percent. (I&E 82/26-82/14,page 52.)

191. A copy of the controlled Brown and Root support drawings and associated Component Modification Cards reviewed by SIT of pipe supports Nos. CT-1-137-701 and CT-1-137-702 (Doyle deposition), which are "correctly" identified as CT-1-137-701-S25R and CT-1-137-702-S25R, and which were reviewed by SIT (I&E 82/26-82/14, page 53.)

192. NCR M-2531, and the follow-up sheets. (I&E 82/26-82/14, page 54.)

193. Applicant's Hydostatic Pre. e Test Data Sheet No. 1CC-014-1101.

194. Applicant's Flow Diagram No. M1 1230, R-6.

195. Gibbs & Hill analysis for stress problem 1-64F.

196. CMC 81948, Revision 3 (and all previous revisions) dated October 28, 1982 which was shown to SIT during "subsequent discussions with Applicant." (I &E 82/26-82/14, page 54).

197. All documentation (notes, etc.) comprising the SIT's verification of the replacement of the damaged tube steel, discussed on page 54 of the I&E report.

198. All documentation (notes, etc.) comprising the SIT's review of the design status of the pipe supports identified by Messrs. Walsh and Doyle. (I & E 82/26-82/14, pages 54 and 55.)

199. All samples of pipe support designs reviewed by SIT in its evaluation of the implementation of the design review process--i.e., all pipe support designs which had completed the design evaluation process and had been marked "vendor-certified." (I&E 82/26-82/14, page 55.)

200. Military Standard 105D-63, "Sampling Procedures and Tables for Inspection by Attributes."

201. All documentation (notes, memoranda, etc.) presented and/or developed during the exit interview conducted February 8, 1983 with the Applicant.

202. The Prestressed Concrete Institute handbook. (See I&E 82/26-82/14, page 20.)