



RELATED CORRESPONDENCE



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )

UNION ELECTRIC COMPANY )

(Callaway Plant, Unit 1) )

) Docket No. STN 50-483-OL  
)  
)

JOINT INTERVENORS' SECOND SET  
OF INTERROGATORIES TO UNION ELECTRIC

Joint Intervenors Coalition for the Environment St. Louis Region, Missourians for Safe Energy and Crawdad Alliance request that the attached interrogatories be answered fully, in writing and under oath by employees or agents of Union Electric Company who have personal knowledge thereof or are the closest to having personal knowledge thereof.

Unless otherwise stated all of the attached interrogatories relate to Union Electric Company's Callaway Plant Unit One. Nuclear Regulatory Commission is sometimes abbreviated "NRC". Union Electric Company is sometimes abbreviated "UE".

"Identify" or "Identification", when used with reference to a document or documents requires, in addition to whatever information is specifically requested, identification of the NRC document number (if applicable), a statement of the date of the document, the general nature and description of the subject matter and contents of the document, and the name(s) of the person(s) who prepared the document.

"Identify" or "Identification", when used with respect to a person or persons requires, in addition to whatever information is specifically requested, a statement of the full name, current or last known address and telephone number, employment and position as of the time period(s) relevant to the subject interrogatory, and current employment and position.

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Joint Intervenors reserve their right to propound additional interrogatories pertaining to Contention No. 2 when the technical specifications, the FES and SER are available.

Respectfully submitted,  
CHACKES AND HOARE

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THE FOLLOWING INTERROGATORIES RELATE TO CONTENTION ONE, I.  
SUBSTANDARD REINFORCED CONCRETE CONSTRUCTION, A. EMBEDDED PLATES

1. Describe the tests performed by Bechtel in its identification of "nonconformances involving more than 300 pieces of misfabricated steel" based on a sampling level of 20-25 percent of the miscellaneous steel pieces produced by Cives Corporation as per the SLBM: 6-514 letter from S.J. Seiken of SNUPPS to R.H. Stone of Bechtel, dated November 5, 1976. In addition, provide the following information:

- a. State the number of embedded plates which had been shipped to the Callaway site as of November 5, 1976.
- b. State how many of those were normally welded.
- c. Describe the actions taken, if any, designed to remedy the nonconformances.
- d. State the number of plates shipped from Cives to the Callaway site prior to June 15, 1977, the date on which Bechtel initiated 100 percent shop inspection at Cives as per the enclosure to BLUE-446 dated October 20, 1977.
- e. Identify relevant documents which contain the information sought in this interrogatory.

2. According to the Daniel Inter-Office Communication PQWP-152 dated October 26, 1977, 2729 manually welded studs were rejected out of 6103 inspected, or 44.72 percent. On how many plates were the defective studs located?

3. Explain why there are differences between the following documents and what information is correct with respect to the total number of embedded plates installed in Q Buildings at Callaway prior to June 9, 1977:

- a. According to DLUC-5414 dated May 23, 1980, Attachment #1. Of the 691 plates installed before June 9, 1977, 232 plates were manually

welded and 459 were automatically welded. (The same numbers were provided by the Applicant in response to Interrogatories 4 and 6).

- b. According to the listing of plates attached to BLUE-675 dated April 6, 1980, 259 plates were installed in concrete by June 9, 1977, with manually welded studs on which "welding between bolts and plates [was] assumed to be undersized by 1/8". (165 plates in the Auxiliary Building, 60 in the Control Building, and 34 in the Communications Corridor).

4. Explain the meaning of plates with or without CMTR's attached, as per Attachment #1 to DLUC-5414.

5. Holds had been placed on the concrete pours at Slab Elevations 1988 and 2000 in the Auxiliary Building at the time the NRC discovered that faulty embeds from Cives were on site at Callaway. In the fall of 1977 the holds were lifted, and the pours proceeded. State whether the embeds which had been installed in the forms for the above two pours had been removed, tested, repaired and/or replaced prior to the pours in the fall of 1977. Identify all documents on which the answer to this interrogatory is based.

- 6. Explain the discrepancy between the number of embeds reportedly returned to Cives in the following two documents:
  - a. "Defective embeds" returned to vendor "Cives" as per Warehouse Superintendent's Report of Shipment, Out-Bound Shipment Number 1077, dated June 27, 1977 in which "Number of Packages" is listed as 60 (NCR 2-1193-C-B, Attachment "B"); and
  - b. Applicant's Answers to Interrogatories of Joint intervenors (First Set) dated July 10, 1981, Answers to Number 8(c)(ii) and (iv) which state 12 manually welded and 36 mechanically welded embeds were returned to Cives, or a total of 48.

7. State if any additional documents or reports of shipment exist other than the Engineered and Material Equipment Return #1077, dated June 27, 1977, concerning the return of defective embeds to Cives. If so, identify those documents or reports.

7A. State whether any embeds have failed after being installed in the plant requiring their replacement. If so, provide the following information separately for each such embed failure:

- a. Location in plant.
- b. Structures supported by the failed embed.
- c. Date of failure.
- d. Date of installation of failed embed.
- e. Consequences of the failure, including structures or systems that fell or were damaged.
- f. Cause of the embed failure.

THE FOLLOWING INTERROGATORIES RELATE TO CONTENTION ONE, I.  
SUBSTANDARD REINFORCED CONCRETE, B. CRACKS IN CONCRETE.

8. This interrogatory pertains to cracks in concrete walls in the Control Building. Provide the following information:

- a. State the dates of each of the following:
  - (i) Concrete pours: 2C351WO1 and 02; and 2C361WO1 through O5.
  - (ii) The dates when cracks were first noticed in each of the above pours.
  - (iii) The date(s) when repairs were made in each area.
  - (iv) The date and pour number of lifts adjacent to each of the areas with cracks.
- b. State the date each of the following Bechtel drawings, as revised, was issued: C-OC3901, revision 8; C-OC3902, revision 8; C-OC3903, revision 6; and C-OC3904, revision 7.

- c. State whether the crack depths were ever measured with instruments, as per page 1 of NCR 2-2173-C-A "Description of Nonconformance."
- d. Explain the disparity in NCR 2-2173-C-A between the recommended dispositions "Use As Is" dated February 24, 1978, and the instruction dated March 14, 1978, to repair the cracks.
- e. Regarding Crack No. 7 on page 4 in NCR 2-2081-C-A:
  - (i) State why Daniel Engineering considered only cracks 11, 13 and 15 to be a reportable condition, but not Crack 7 which extends through the depth of the wall, has a width which also is described as not exceeding 1/16", and is over 34 feet long, longer than cracks 11,13 and 15.
  - (ii) State whether instrument measurements were made of the length, width and depth of Crack 7 on the outside face of the wall; and if the answer is affirmative, state the results of each measurement.
- f. State the reason(s) why there was a delay of over one year before NCR 2-2081-C-A was signed off, as per "Statement of Completed Action."
- g. Regarding Crack 6 in NCR 2-2081-C-A: State whether this crack is visible from only the Control Building side of the wall, as per Applicant's Answer to Interrogatory No. 18 (July 10, 1981).
- h. Describe the stresses or other phenomena which explain why some of the cracks in the Control Building walls extend from one concrete lift to an adjacent one.
- i. State whether additional measurements of the cracks were made by Daniel Civil Engineering on or about June 18, 1981, and if the answer is affirmative, the results of the measurements. State further whether any cracks other than those delineated on NCR 2-2081-C-A were located during the inspection, and if so, specify locations and sizes.

- j. State whether an NCR was issued on February 21, 1978, which superceded 2-2081-C-A, and if so, identify said NCR and state why it was then superceded by 2-2173-C-A, as per the comment on page 1 of the latter, "originally issued 2-21-78."

9. Explain why Paper Calmenson should have been advised "to reject such [cracked Turbine Pedestal leg] bars before they are shipped," as per the SNUPPS (Bechtel) Trip Report of May 10-11, 1977, regarding the Reactor Pit Moat Area crack, page 1 of 4.

10. Describe the dimensions and circumferential function of the M4 x 13 beam embedded in the reactor cavity moat area to which the one-fourth inch liner plate was welded.

THE FOLLOWING INTERROGATORIES RELATE TO CONTENTION ONE, I. SUBSTANDARD REINFORCED CONCRETE CONSTRUCTION, C. HONEYCOMBING.

11. This interrogatory applies to the following partial sentence in the Answer of the NRC Staff to Joint Intervenors' Interrogatories numbers 35 and 36 with regard to the Tendon Access Gallery: "The details of removing unsound concrete surrounding the main steel and in back of base plates were accomplished by one man (skilled laborer) . . ."

- a. State the number of manhours expended on the chipping operation.
- b. State whether the skilled laborer was a concrete finisher, or if not, the craft in which he is skilled.

12. This interrogatory applies to the grouting of the voids in the Tendon Gallery Roof:

- a. State whether it is correct, according to the Applicant's Answer to Interrogatory No. 42(c)(3), that all grout and drypack were placed on September 26, 28 and 29, and on December 7, 1978.
- b. If the answer to (a) is negative, explain.

- c. If the answer to (a) is affirmative, state the reason(s) for the delay of two months in the completion of the repair procedure.
- d. State the number of manhours expended in the placing of the grout and drypack.
- e. State the quantity of grout and drypack placed.

13. State the diameters or sizes of those reinforcing bars in the bottom lift of the base mat which were exposed following the chipping of the defective concrete.

14. Explain the relationship of the hemispherical dome and cylindrical shell cited by Applicant in response to Joint Intervenors' Interrogatory No. 60.

15. State whether the matter of flaking concrete referred to in Joint Intervenors' First Set of Interrogatories numbers 68 and 69 has been closed. Identify all documents pertaining to the current status of this nonconformance.

THE FOLLOWING INTERROGATORIES RELATE TO CONTENTION ONE, I. SUBSTANDARD REINFORCED CONCRETE, D. CONCRETE COVER.

16. Explain the following discrepancies:

- a. In the "Answers of the NRC Staff to Joint Intervenors' First Set of Interrogatories . . ." the NRC Staff provided a list entitled "NCR's Related to Concrete Placement 2C231WO3" in answer to Interrogatory No. 68. Although this NRC list contains 23 NCRs, it does not include Number 2-1683-C-A or Number 2-1042-C-A, both of which were included by the Applicant in its document production.
- b. The Applicant, on the other hand, did not provide NCR Number 2-1411-C-A or Number 2-1594-C-A among the 23 NCRs it produced in response to Interrogatory No. 80 and Document Request No. 47. Both of these NCRs were included in the NRC list of 23.
- c. NCR Number 2-1532-C-B is listed by the Applicant in response to Interrogatory 81 as one of nine NCRs outstanding on November 21, 1977,

the eve of the third lift pour, but it is not included in the NRC Staff's list and was not included by the Applicant in its document production.

17. Provide the following information about the NCRs provided in response to Document Request No. 47:

- a. Explain how the Applicant is able to tell which nine NCRs out of the 23 pertaining to the third lift were still outstanding—that is, not yet "closed out"—as of the evening of November 21, 1977 (as per the Applicant's answer to Interrogatory No. 81).
- b. Explain how the Applicant knows that an NCR has been reworked or repaired prior to concrete placement when the only information included on the NCR form in the section entitled "Statement of Completed Action" is either the notation, "work completed per approved disposition," signed and dated a few days or months after the concrete pour, and/or "Hold tag destroyed" or "Hold tag lost in field," also dated after the pour.
- c. State on what part of the NCR form the following two notations appear: (i) the pre-pour disposition action completion date, and (ii) evidence that the "rework" or "repair" has been completed as per the recommended disposition.
- d. Regarding NCR Number 2-1613-C-A, describe the actions taken and the relevant dates to indicate that the Applicant corrected the interference of the rebars with the tendon sheathing at the feedwater line and blow down line areas (Areas P8-P12, P7-P11, P6-P10 and P5-P9), prior to the concrete pour number 2C231WO3.
- e. Describe the rework or repair actions taken on each of the following NCRs which were still outstanding as of November 21, 1977, prior to the third lift pour: NCR Nos. 2-1470-C-D; 2-1511-C-A; 2-1595-C-D; 2-

1605-C-B; and 2-1634-C-A. State whether the actions were taken in each case after the departure from the Callaway site of the two NRC staff members, the evening of November 21, 1977, if the information is available.

- f. If the recommended disposition on NCR Number 2-1532-C-B was to "rework" or "repair", rather than to "use as is", describe the actions taken to correct the nonconformance.
- g. At what time of day on November 22, 1977, did Concrete Pour Number 2C231WO3 begin?

18. This interrogatory refers to the Applicant's response of July 10, 1981, to Interrogatory No. 71 in which the Applicant refers to January 5, 1978, as the date on which "the NRC [Staff] was conducting a special, announced investigation into allegations regarding, among other things, improper concrete cover for reinforcement."

- a. State whether Eugene Gallagher and James Foster of the NRC Staff also inspected the placement of reinforcing bars for the Fourth Lift of the Containment Building with William Smart, ironworker, on January 3, 1978.
- b. If the answer to (a) above is affirmative, explain why this date was omitted from the Answer to Interrogatory No. 71.
- c. State whether the NRC Staff directed questions orally or in writing to representatives of Union Electric or its contractors in early January 1978 about the placement of the reinforcing steel, maximum and minimum concrete cover tolerances, and/or other potential nonconformances with regard to the Fourth Lift.
- d. If the answer to (c) above is affirmative, state what actions were taken, if any, by the Applicant. State further how many manhours were expended on any reworking.

- e. State how close (in terms of time and stage of preparation) the Applicant was to having the concrete placement proceed at the time the NRC Staff inspected the Fourth Lift with William Smart.
- f. State the date of the commencement of the installation of the Fourth Lift reinforcing steel.
- g. Explain the reason(s) why the Applicant spent 50 days installing reinforcing steel for Pour #4 as compared with 33 days for Pour #3, as per Applicant's Answer to Interrogatory No. 92 (July 10, 1981).

THE FOLLOWING INTERROGATORIES RELATE TO CONTENTION ONE,

## II. SUBSTANDARD PIPING

19. In response to Joint Intervenor's Document Request No. 48 (First Set) Union Electric states, "The purchase orders to Dravo do not specify the pipe manufacturer and therefore Applicant is unable to differentiate purchase orders applicable to Youngstown Welding and Engineering manufactured pipe from pipe manufactured by other entities." In a letter to the NRC Region III office (ULNRC-314) dated May 11, 1979, from Union Electric the following statement is made: "A survey of current SNUPPS suppliers of pipe spools and preassembled pipe formations indicates that only Dravo Corporation, Marietta, Ohio has supplied pipe spools containing fusion welded SA-312 type 304 pipe (without filler material) manufactured by Youngstown Welding and Engineering Company." Attached to the letter is a list of 65 pipe spools containing the SA-312 pipe manufactured by YW&E.

- a. In conducting the survey cited in the above letter, identify the documents that were examined to locate and identify the 65 pipe spools containing the SA-312 pipe manufactured by YW&E.

- b. Can the Applicant locate and identify the purchase orders used to procure the 65 pipe spools cited in the letter to the NRC?
- c. If the answer to the preceding question is affirmative, please identify the purchase orders, with attachments including all specifications, for the 65 pipe spools listed in the UE letter.
- d. The list of 65 pipe spools attached to the UE letter has a heading which reads "Enclosure 5." Was this attachment a part of or included with another letter, report, memo or written document?
- e. If the answer to the above question is affirmative, please identify the document with all of its enclosures and attachments.
- f. If the answer to question (d) is other than affirmative, please explain what "Enclosure 5" means since there is only one attachment to the UE letter.

20. In a letter from Aptech Engineering Services of Los Altos, California (re: Lack of Fusion in Stainless Steel Welded Pipe) to W.R. Smith, Bechtel National Inc., dated May 15, 1979, Geoffrey R. Egan states, "We believe the defects we have seen will be more significant from the point of view of fatigue failure (rather than fracture)."

- a. Are the defects more significant from a fatigue failure point of view than from a fracture point of view?
- b. State the reasons and factual basis for your answer to the preceding question.
- c. Identify all documents you rely upon to substantiate your answers to (a) and (b) above.
- d. Can fatigue affect the structural integrity of SA-312 pipe containing lack-of-penetration defects?
- e. State the factual basis for your answer to the preceding question.

- f. Identify all documents you rely upon to substantiate your answer to questions (d) and (e) above.
- g. Has a fatigue evaluation been made for SA-312 pipe with lack-of-penetration in the longitudinal welds?
- h. If the answer to the preceding question is affirmative, please state the extent of the evaluation and identify the documents which contain the evaluation.
- i. Did Bechtel evaluate fatigue failure prior to making the recommendations in its June 1979 report titled, "Report on Investigation of Weld Imperfections in ASME SA-312 Double Welded Austenitic Stainless Steel Pipe for Compliance with NRC I&E Bulletin 79-03"?
- j. If the answer to the preceding question is affirmative, state the extent of the evaluation and identify all documents which reflect the evaluation.
- k. If the answer to the question (i) is other than affirmative, state the reasons and factual basis for not evaluating fatigue failure.

21. Concerning Residual Heat Removal system integrity, Regulatory Guideline 1.139 states, "The RHR system should be designed and constructed to have the capability to remove heat from the reactor coolant during normal and following accident conditions." In the attachment to the Union Electric letter (ULNRC-314), dated May 11, 1979, to the NRC Region III, 56 spool pieces containing Youngstown Welding and Engineering SA-312 pipe are listed as parts of the RHR system, as identified by the EJ designation.

- a. Could fatigue failures in the longitudinal seam welds of SA-312 piping impede the capability of the RHR system to remove heat from the reactor coolant during normal or following accident conditions?
- b. State the factual basis for your answer to the preceding question.

- c. Identify and supply a copy of all the documents you rely upon to support your answer to questions (a) and (b) above.
- d. What is the maximum amount of irradiation SA-312 piping could be exposed to following accident conditions?
- e. What is the longest period of time following an accident, that the RHR system could be required to remove heat from the reactor coolant?
- f. Could irradiation affect the mechanical properties of SA-312 piping with lack-of-penetration defects in a manner that would alter the significance of the defects?
- g. State the factual basis for your answer to question (f) above.
- h. Identify all the documents you rely upon to substantiate your answer to questions (f) and (g) above.
- i. At what percentage level of chemical composition does copper affect the crack susceptibility of irradiated austenitic stainless steel using the amount of radiation and exposure time given in answer to questions (d) and (e) above?

22. An NRC Region IV Vendor Inspection Branch report, No. 99900029/79-01, concerns SA-312 pipe manufactured by Youngstown Welding and Engineering and states, "Welding procedure No. 750 has been in use since 1972 and although it was requalified in March, 1975, the "Welding Procedure 750 Supplements" limiting parameters to wall thickness, were not implemented until December 1978, and therefore the SA-312 piping welded prior to this date using WPS No. 750 may be considered suspect in quality of the welds." In the Union Electric letter (ULNRC-314) dated May 11, 1979, to the NRC Region III reference is made to 65 spool pieces containing SA-312 piping manufactured by Youngstown Welding and Engineering.

- a. What welding procedure was used by YW&E in manufacturing the SA-312 pipe referred to in the Union Electric letter?

- b. When was the SA-312 pipe referred to in the Union Electric letter welded?
- c. Were radiographic or ultrasonic methods of examination used in qualifying YW&E welding procedure No. 750 and its supplements?
- d. Identify the YW&E procedure qualification record used to qualify procedure No. 750.
- e. Are radiographic and/or ultrasonic methods reliable means of qualifying welding procedures that may produce lack-of-penetration without a discrete gap between abutting joint surfaces?
- f. State the factual basis for your answer to the preceding question.

23. A SNUPPS letter (SLNRC 79-16) to the NRC, dated October 5, 1979, refers to 'efficiency factors'.

- a. What is the function or purpose of 'efficiency factors'?
- b. What procedure or method is used to determine an efficiency factor, specifically the .85 efficiency factor referred to in Note 3 to Table I-7.2 of Appendix I of Section III of the ASME Code for butt welds made without filler metal?
- c. Define and elucidate the term "volumetric examination" as used in the phrase, "volumetric examination of the longitudinal weld" used in the above cited letter.
- d. According to Note 3 to Table I-7.2, Appendix I, Section III of the ASME Code, what is the efficiency factor for butt welds, made without filler metal, and examined by the radiographic method according to ASME Section III, NC-2550?

24. An enclosure with the SNUPPS letter (SLNRC 79-16), cited above, is a June 1979 Bechtel report titled, "Report on Investigation of Weld Imperfections in

ASME SA-312 Double Welded Austenitic Stainless Steel Pipe for Compliance With I & E Bulletin 79-03."

- a. Basing your answer on the Bechtel report, could SA-312 pipe installed at Callaway have undetected amounts of centerline lack-of-penetration (CLP)?
- b. What is the maximum size CLP defect that could have been produced using the welding procedure in effect when SA-312 pipe was manufactured by Youngstown Welding and Engineering prior to mid-November 1978?
- c. Will pipe with up to 26% CLP pass a flattening test, using the criterion of ASME Section II, SA-312, paragraph 10.2 and SA-530 paragraph 4.2?
- d. Is evidence of CLP a cause for rejection in conducting flattening tests, as those flattening tests listed in the material test reports of YW&E?
- e. Does the pipe that was returned by Pullman Power Products represent the total sample of production pipe used in conducting the tests cited in the Bechtel report?
- f. If the answer to question (e) above is other than affirmative, list and identify other samples of production pipe used in testing.
- g. Is the pipe returned by Pullman Power Products typical of all the SA-312 pipe produced prior to mid-November 1978?
- h. State the factual basis for your answer to question (g) above.
- i. Could CLP defects exist in SA-312 pipe now installed at Callaway that exceed the 26% worst case cited in the Bechtel report?
- j. State the factual basis for your answer to question (i) above.
- k. Identify all of the documents you rely upon in responding to questions (i) and (j) above.

- l. Would reducing the wall thickness of the test samples by 12.5% significantly affect the test results or fracture analysis cited in the Bechtel report?
- m. State the factual basis for your answer to question (l) above.
- n. Identify all the documents you rely upon in responding to questions (l) and (m) above.

25. In response to Joint Intervenor's Interrogatory No. 94 Union Electric states, "In dealing with fittings made in accordance with SA-403, the fittings may be fusion welded or forged."

- a. Is Union Electric able to identify and locate fusion welded SA-403 fittings used in safety related piping at the Callaway plant?
- b. If the answer to the above question is affirmative, list the spool piece number, size of fitting and line number of all of the fusion welded SA-403 fittings used in safety related piping.
- c. Could SA-403 fittings contain undetected amounts of centerline lack-of-penetration if a discrete gap does not exist between the abutting surfaces of the joint?
- d. State the factual basis for your answer to question (c) above and in your answer account for the inability of radiographic and ultrasonic methods of examination to detect CLP as reported in the Bechtel report cited in interrogatory 24 above.

26. NRC Region III, IE Report No. 50-483/81-04 states, "Review of vendor radiographs indicated that one approximately four inch area of the pipe piece (the area of the alleged pipe crack) should have received further vendor review and possibly re-work to remove excess weld reinforcement."

- a. What caused the excess reinforcement cited in the report?

- b. Photographs of the excess reinforcement indicate a blackened and rough appearance of the weld after the pipe was pickled. Is this typical of welds made with the Submerged Arc Welding Process?
- c. Could the appearance of the weld indicate that the excess reinforcement was caused by a welding pass from the outside of the pipe burning through the pass or passes made from the inside of the pipe?
- d. Would exposing the weld puddle to the atmosphere affect the mechanical properties of the weld?
- e. Nonconformance Report No. 2SN-0496-P concerns a minimum wall violation and states under the heading, Cause of Nonconformances and Actions to Prevent Recurrence, "Vendor should be notified by Bechtel to prevent recurrence."
  - (i) Did Bechtel notify the vendor as here stated:
  - (ii) Identify all documents you rely upon to answer the preceding question.

27. A Bechtel Power Corporation report dated November 28, 1979 and titled, "Final Report on Gulf & Western Preassembled Formation for Callaway Plant Unit One [Union Electric] and Wolf Creek [Kansas Gas and Electric]", concerns rejectable indications found in welds in preassembled pipe formations.

- a. Apart from inspections and audits of vendor's quality assurance program, what actions has the Applicant taken to insure the quality and conformance to specifications of items and materials purchased from vendors?
- b. Is the Applicant dependent on non-required or voluntary examination to discover significant rejectable defects in vendor supply items that have not been rejected by the vendor quality control program and delivered to the construction site?

c. State the factual basis for your answers to the above questions.

GENERAL INTERROGATORY

28. Identify, separately for each of the above interrogatories and subparts thereof, the person(s) providing the answer.