

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of)

CONSUMERS POWER COMPANY)

(Midland Plant, Units 1 and 2))

) Docket Nos. 50-329-OM
) 50-330-OM
) 50-329-OL
) 50-330-OL
_____)

CONSUMERS POWER COMPANY'S PROPOSED FINDINGS
OF FACTS AND CONCLUSIONS OF LAW

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PROPOSED FINDING OF FACTS AND
CONCLUSIONS OF LAW

I. Preliminary Statement

1. In July, 1978, Consumers Power Company ("Consumers Power") while monitoring the diesel generator building at the Midland site, detected building settlement in excess of that originally anticipated. During August, Consumers Power and Bechtel, Corp., its architect-engineer, conducted an internal investigation which included an analysis of soil borings, begun on August 25, 1978, indicating that the compaction of the soils was significantly less than was measured during the placement of the fill. Construction work on the diesel generator building was suspended on August 23, 1978.

2. Based on the results of this internal investigation, Consumers Power informed the Nuclear Regulatory Commission ("NRC") Region III Resident Inspector that the excess settlement was potentially reportable under 10 CFR §50.55(e) on September 7, 1978. On September 27, 1978, Consumers Power reported the diesel generator building's excess settlement to the NRC as a significant construction deficiency pursuant to 10 CFR §50.55(e)(1)(iii). As the investigation and analysis of the soil settlement issues continued, additional 50.55(e) reports were filed.

3. Consumers Power and Bechtel personnel formed a task force to resolve technical issues relating to foundation soils shortly after the discovery of the excess settlement. Drs. Ralph Peck and Alfred Hendron were retained in September,

1978, to assist the task force in the assessment of corrective actions. After consideration, the task force recommended the diesel generator building to be subjected to a "preload" or "surcharge" to remedy the settlement difficulties with the diesel generator building. Consumers Power adopted the "surcharge" recommendation. Construction work on the diesel generator building resumed since the primary soils problems had been identified and the additional structural weight generated during such construction would enhance the effectiveness of the preload. Instrumentation to monitor the effectiveness of the proposed surcharge was installed prior to the placement of the surcharge. On January 26, 1979, application of the surcharge to the diesel generator building began. It remained in place from April 6 to August 15, 1979. Removal was completed by August 30, 1979.

4. Following Consumers Power's reporting of the excess settlement pursuant to 10 CFR §50.55(e), the NRC Staff conducted two preliminary investigations of the soil settlement problems. The first investigation was conducted in October, 1978, and culminated in Investigation Report 78-12 which was filed on November 17, 1978. A second, follow-up investigation was conducted from December, 1978, through January 1979. This second investigation resulted in Investigation Report 78-20, which was sent to Consumers Power on March 22, 1979.

5. On March 21, 1979, the Staff sought further information from Consumers Power through written questions pursuant

to 10 CFR §50.54(f). This initial set of inquiries included twenty-two questions, the first of which concerned the identification of the root causes of the quality assurance deficiencies which resulted in the diesel generator building's excess settlement and the actions taken or proposed to correct such deficiencies. The remainder of the twenty-two 50.54(f) questions dealt with, among other things, the remedial actions proposed for the Midland structures and other issues generally not related to quality assurance.

6. In April, 1979, Consumers Power responded to 10 CFR §50.54(f) Question No. 1 by submitting to the NRC a description of the root causes of the quality assurance problems which resulted in the diesel generator building's excess settlement, the actions taken to correct the quality assurance problems, and the programs implemented to prevent the quality problems' recurrence in soils and other construction areas. Consumers Power presented its findings to the NRC subsequent to its response to 50.54(f) Question No. 1 at a meeting held on July 18, 1979.

7. On September 11, 1979, the NRC issued a supplemental 50.54(f) question pertaining to quality assurance (Question No. 23). Consumers Power replied to this supplemental question by November 13, 1979, detailing further: the root causes of the deficiencies in the Midland quality assurance program which contributed to, or impeded earlier detection of, the soils settlement; the actions taken or to be taken to correct the soils quality assurance deficiencies;

the actions taken or to be taken to correct the written quality assurance program (programmatic); the actions taken or to be taken to preclude potential quality assurance problems in areas other than soils (generic); the measures taken to insure that inconsistencies in the FSAR were remedied; and the continuing improvements to the Midland quality assurance program and its implementation since 1977.

8. On December 6, 1979, the NRC Staff, through the offices of Nuclear Reactor Regulation and Inspection and Enforcement, issued an "Order Modifying Construction Permits" ("Modification Order") which would have suspended all soils-related and remedial work on the Midland Plant, Units 1 and 2 until a construction permit amendment for the soils remedial work was submitted and approved by the Staff. The three grounds enumerated by the Staff as the basis for the Modification Order were "quality assurance deficiencies involving the settlement of the diesel generator building and soil activities at the Midland site, the false statement in the FSAR, and the unresolved safety issue concerning the adequacy of the remedial action to correct the deficiencies in the soil under and around safety-related structures and systems...." Modification Order at p. 4.

9. On December 26, 1979, Consumers Power stayed the effectiveness of the Modification Order by responding to the Staff's Modification Order with a Request for Hearing in accordance with Part V of the Modification Order. Notice of this hearing ("OM proceeding") was published on March 20,

1980. In this notice, the NRC appointed the Atomic Safety and Licensing Board ("Licensing Board") and instructed the Licensing Board to consider whether the facts set forth in Part II of the Modification Order are correct and whether the Modification Order should be sustained. (45 Fed. Reg. 18214) Thereafter, Consumers Power filed its "Answer to Notice of Hearing," dated April 16, 1980, in which Consumers Power responded to the factual allegations set forth in the Modification Order and presented its position with respect to whether the Modification Order should be sustained.

10. Although the Notice set forth all the issues which must be considered and decided by this Board, this partial initial decision addresses only the quality assurance issue set forth in the Modification Order and the managerial attitude issue, raised by contentions filed by intervenors. A partial initial decision addressing the remaining issues, the material false statement and adequacy of remedial measures taken with respect to soils settlement matters, will be issued after the conclusion of later public hearings on these matters.

11. In response to the NRC Staff's "Motion for issuance of Amended Notice of Hearing," dated April 30, 1980, with which Consumers Power concurred on May 15, 1980, the Licensing Board published an "Amended Notice of Hearing" on May 20, 1980, which invited petitions for leave to intervene in the OM proceeding by any person whose interest may be

affected thereby (45 Fed. Reg. 35949). Numerous petitions for leave to intervene were timely filed.^{1/}

12. On May 27, 1980, Consumers Power filed a "Motion for Partial Consolidation," wherein Consumers Power moved to consolidate the construction modification proceeding with the proceeding involving applications for operating licenses for the Midland Plant, Units 1 and 2, to the extent that the operating license proceeding also included soils related issues. The NRC Staff responded to the Motion for Partial Consolidation on June 16, 1980.

13. By its "Memorandum and Order" entered on June 27, 1980, the Licensing Board granted the NRC Staff's request to postpone further response to Consumers Power's Motion for Partial Consolidation until after intervention in the OM proceeding had been determined.

14. Consumers Power filed its answers to the petitions for leave to intervene on July 1 and 8, 1980. The NRC Staff's responses to the petitions for leave to intervene were submitted on July 14, 1980. On July 24, 1980, the Atomic Safety and Licensing Board issued its "Memorandum and Order Ruling Upon Standing to Intervene" in which it ruled

^{1/} Petitions for leave to intervene were received from Carol Gilbert, William A. Thibodean, George C. Wilson, Sr., Sharon K. Warren, Terry R. Miller, Patrick A. Race, Michael A. Race, Sandra D. Reist and Barbara Stamiris. A letter-petition for leave to intervene, dated June 23, 1980, was received from Wendell H. Marshall, the representative of the Mapleton Intervenor in the operating license proceeding for the Midland Plant, Units 1 and 2.

that nine petitioners for leave to intervene in the OM proceeding had satisfied the "interest" and "aspect" requirements of 10 CFR §2.714(a)(2) and provided for the later filing of contentions within the scope of this proceeding.^{2/} The Licensing Board deferred ruling on Wendell H. Marshall's letter-petition for leave to intervene in the OM proceeding.

15. In its "Order and Notice of Prehearing Conference," July 24, 1980, the Licensing Board scheduled a Special Prehearing Conference for September 10, 1980 to consider whether Petitioners' contentions satisfied the legal requirements of the Nuclear Regulatory Commission's regulations and Consumers Power's Motion for Partial Consolidation.

16. On September 10, 1980, the Special Prehearing Conference was held in Midland, Michigan. At the Special Prehearing Conference, the Licensing Board considered supplementary contentions which had been filed by Barbara Stamiris, Sharon K. Warren and Wendell Marshall. The Licensing Board ruled that Ms. Stamiris and Ms. Warren had satisfied the contention requirement of 10 CFR §2.714(b) and admitted both as intervenors in this proceeding. The Licensing Board also concluded that Mr. Marshall had established standing to participate in this proceeding. All other petitions for leave to intervene in the OM proceeding were dismissed for Petitioners' failure either to file contentions or to partici-

^{2/} Patrick A. Race, Barbara Stamiris, Sandra D. Reist, Sharon K. Warren, Terry R. Miller, Michael A. Race, George C. Wilson, Sr., William A. Thibodean and Carol Gilbert.

pate in the special prehearing conference. The Licensing Board authorized discovery on contentions as to which there were no objections, but deferred ruling on the contested contentions and Consumers Power's Motion for Partial Consolidation.

17. On September 19, 1980, Charles Bechhoefer replaced Ivan W. Smith as Chairman of the Licensing Board presiding over this OM proceeding.

18. Thereafter, on October 24, 1980, the Licensing Board entered its "Prehearing Conference Order Ruling On Contentions And On Consolidation of Proceedings" in which it ruled on the admissibility of Ms. Stamiris', Ms. Warren's and Mr. Marshall's contentions, consolidated the soils-related aspects of the operating license proceeding with the construction permit modification proceeding, admitted the parties in the operating license proceeding into the construction permit proceeding, and ordered the commencement of discovery.^{3/}

^{3/} In its October 24, 1980 prehearing conference order, the Licensing Board denied Mr. Marshall's petition for leave to intervene in the OM proceeding because Mr. Marshall's only contention was inadmissible for lack of specificity. In the same order, however, Mr. Marshall was admitted as a party in the OM proceeding by virtue of his status as an intervenor in the operating license proceeding, which the Licensing Board consolidated with the OM proceeding. Mr. Marshall appealed the denial of his petition to intervene. The Atomic Safety and Licensing Appeal Board affirmed the Licensing Board's action denying Mr. Marshall's petition. Consumers Power Company (Midland Plant, Units 1 and 2) ALAB-624, 12 NRC 680 (1980).

19. Discovery was initially scheduled to terminate on December 26, 1980. By order of the Licensing Board on December 4, 1980, discovery was extended until January 23, 1981.

20. On December 15, 1980, the Licensing Board scheduled a prehearing conference in this proceeding for January 28 and 29, 1981. This prehearing conference was held at the above date in Midland, Michigan. At the prehearing conference, there was discussion as to, among other things, the issues to be heard at the forthcoming hearing on soils settlement issues. Consumers Power sought to have the soils settlement issues, including actions to be taken to correct any settlement which had occurred and to preclude or limit any further settlement, heard on the basis of the seismic evaluation performed during the construction permit review. Consumers Power also sought to defer any further consideration of seismic issues until the operating license proceeding for the Midland Plant, Units 1 and 2. Both the NRC Staff and Ms. Stamiris opposed Consumers Power's request.

21. Ms. Warren withdrew as an intervenor from the OM proceeding effective February 16, 1981. On March 2, 1981, Ralph S. Decker replaced Gustave A. Linenberger on the Licensing Board presiding over this proceeding.

22. On March 18, 1981, Consumers Power filed a "Motion to Defer Consideration of Seismic Issues Until the Operating License Proceeding." By responses dated April 6 and 7,

1981, respectively, Ms. Stamiris and the NRC Staff opposed this motion.

23. On April 14, 1981, Ms. Stamiris filed a "Motion for Summary Disposition on Applicant's Of Intent As A Basis For Reasonable Assurance Judgments On Quality Assurance." The NRC Staff and Consumers Power opposed Ms. Stamiris' motion by responses dated, respectively, May 1 and 5, 1981.

24. Also, on April 14, 1981, the NRC Staff filed a "Motion For Summary Disposition On the Issue of Quality Assurance Implementation Prior To December 6, 1979." Consumers Powers' response in opposition was filed May 25, 1981.^{4/}

25. A second prehearing conference was held in Midland, Michigan on April 27, 1981. It predominantly concerned Consumer Power's Motion to Defer Consideration of Seismic Issues Until the Operating License Proceeding ("Motion to Defer"). As announced at the prehearing conference, and formalized in the "Prehearing Conference Order," dated May 5, 1981, the Licensing Board disposed of Consumers Power's Motion to Defer based on an agreement worked out between Consumers Power and the NRC Staff. No party objected to this agreement.

26. On May 14, 1981, the NRC filed a "Motion To Clarify The Discussion Of TMI-Related Contentions At The April 27,

^{4/} In light of the "Nuclear Regulatory Commission/Consumers Power Company Quality Assurance Stipulation," it became unnecessary for the Licensing Board to rule on the NRC Staff's and Consumers Power's motions.

1981 Prehearing Conference," in which the NRC Staff requested a clarification as to the possibility of filing TMI-related contentions in the operating license proceeding. Consumers Power joined with the NRC Staff in requesting such clarification on May 28, 1981.

27. On May 29, 1981, the Licensing Board entered its "Notice of Evidentiary Hearing," in which it scheduled the evidentiary hearing for this proceeding to commence on July 7, 1981.

28. By its "Memorandum and Order" dated June 12, 1981, the Licensing Board ruled on the remaining motions in this proceeding. The Licensing Board, among other things, denied Ms. Stamiris' motion for summary disposition against Consumers Power, denied Ms. Stamiris' outstanding discovery requests, and supplied the clarification of the possibility of filing TMI-related contentions which both NRC Staff and Consumers Power had requested.

29. The evidentiary hearing began in Midland, Michigan on July 7, 1981. Evidentiary hearings were held on July 7, 1981 through July 17, 1981, August 4, 1981 through August 13, 1981, and October 13, 1981 through October 16, 1981. As of this last session of evidentiary hearings, the NRC Staff, Intervenor and Consumers Power have completed their evidentiary presentation on all quality assurance aspects of the Modification Order, all managerial attitude issues raised by Ms. Stamiris in her contentions 1(a), 1(b) and 3,

and the examples outlined in Ms. Stamiris' Answers to Interrogatories, filed April 20, 1981.^{5/}

30. On September 2, 1981, Consumers Power filed its "Motion For Partial Decision On Quality Assurance Issues Of the December 6, 1979 Order and certain Contentions Involving Quality Assurance and Managerial Attitude" ("Motion for Partial Decision"). The NRC filed its response in support of Consumers Power's motion on September 22, 1981. Ms. Stamiris opposed Consumers Power's request by her response filed September 15, 1981. The Licensing Board granted permission to all parties to file proposed findings of fact and conclusions of law on the issues of quality assurance^{6/} and managerial attitude on October 8, 1981.

31. The record in this proceeding to date consists of all pleadings filed to date, all transcripts from the prehearing conferences held on September 10, 1980, January 28 and 29, 1981, and April 27, 1981, and the transcripts of the

^{5/} Additional material bearing on quality assurance and managerial attitude may be introduced in later hearings and will be the subject of supplemental proposed findings of fact as they relate to several "open items" noted in the Licensing Board's Memorandum granting Consumers Power's "Motion For Partial Decision." These items include: (1) the merits of the material false statement; (2) the acceptance criteria for remedial actions; and (3) quality assurance or managerial attitude issues which may arise in relation to technical issues. Memorandum (Concerning Telephone Conference Call of September 25, 1981 and Applicant's Motion for Partial Decision), dated October 2, 1981, at pp. 3-5.

^{6/} Although Contention 1(d) concerns quality assurance and managerial attitude, because it involves technical issues a decision on it was deferred to a later date.

evidentiary hearings held on July 7, 1981 through July 17, 1981, August 4, 1981 through August 13, 1981, and October 13, 1981 through October 16, 1981, and all the exhibits identified and admitted into evidence as listed in Appendix A to this Partial Initial Decision.

32. In making the following findings of fact and conclusions of law, the Licensing Board reviewed and considered the entire record of the proceedings and all the proposed findings of fact and conclusions of law submitted by the parties. All the proposed findings of fact and conclusions of law submitted by the parties which are not incorporated directly or inferentially in this Partial Initial Decision are rejected as being unsupported in law or fact or as being unnecessary to the rendering of this decision.

II. Findings of Fact.

A. Quality Assurance Issues Arising From the Modification Order

33. The Modification Order states that:

"the quality assurance deficiencies involving the settlement of the diesel generator building and soils activities at the Midland site ... are adequate bases to refuse to grant a construction permit and that ... suspension of certain activities under Construction Permits No. CPPR-81 and No. CPPR-82 is warranted until the related safety issues are resolved."7/

35. In June, 1981 the NRC Staff and Consumers Power entered into a stipulation pertaining to the quality assur-

7/ Modification Order at p. 4.

ance aspects of the Modification Order.^{8/} The stipulation was submitted to the Licensing Board on July 7, 1981. It follows in its entirety:

1. Prior to December, 1979, there were quality assurance deficiencies related to soil construction activities under and around safety-related structures and systems at the Consumers Power Midland Plant construction site ("Midland") in that (i) certain design and construction specifications related to foundation-type material properties and compaction requirements were not followed; (ii) there was a lack of clear direction and support between the contractor's engineering office and construction site as well as within the contractor's engineering office; (iii) there was a lack of control and supervision of plant fill placement activities which contributed to inadequate compaction of foundation material; and (iv) corrective action regarding nonconformances related to plant fill was insufficient or inadequate as evidenced by repeated deviations from specification requirements.
2. Consumers Power agrees not to contest the NRC Staff's conclusions that the events referred to in paragraph 1 constituted a breakdown in quality assurance with respect to soils placement at Midland and constituted an adequate basis for issuance of the order of December 6, 1979.
3. The quality assurance program satisfies all requisite NRC criteria. Further, as a result of revisions in the quality assurance program, the improved implementation of that program,

^{8/} Tr. 987-89, 1044-1079.

and other factors discussed in testimony submitted by James G. Keppler, the NRC has reasonable assurance that quality assurance and quality control programs will be appropriately implemented with respect to future soils construction activities including remedial actions taken as a result of inadequate soil placement.^{9/}

35. A show cause proceeding at the construction permit stage such as this presents two issues for consideration. First, we must consider whether there was justification for the Modification Order's conclusion that the quality assurance deficiencies involving soils activities at Midland "are an adequate bases to refuse to grant a construction permit." Second, if there is an affirmative finding as to the first issue, we must then determine whether the Order should be enforced, suspending certain construction activities "until the safety issues are resolved." On July 8, 1981, we formally accepted Paragraphs 1 and 2 of the stipulation.^{10/} As noted in our Memorandum and Order (Ruling Upon the Stipulation), these paragraphs essentially constitute an admission by Consumers Power of many of the facts in the Modification Order describing the soils related quality deficiencies.^{11/} Therefore, with respect at least to the first issue in the

^{9/} The stipulation does not cover assertions in the Modification Order concerning (1) material false statements and (2) failure of the Applicant to supply the NRC Staff with adequate information concerning the remedial soils measures. Tr. 1173.

^{10/} Tr. 1172-1173.

^{11/} Tr. 1174.

modification proceeding - whether the soils quality assurance deficiencies are an adequate basis for the Modification Order - we are able to make an affirmative finding.^{12/}

37. We did not formally adopt Paragraph 3 of the Stipulation. It deals with the second issue of the show cause hearing - whether the safety issues have been resolved so that the quality assurance program with respect to soils is now being properly implemented and there is reasonable assurance such implementation will continue through the construction process. As Paragraph 3 of the Stipulation itself contemplates,^{13/} both the Staff and Consumers Power presented extensive evidence for our consideration on this issue.

(1) Evidence of Reasonable Assurance

37. The principal management officials from Consumers Power with responsibility for the Midland Project and senior personnel from Bechtel Project management testified. These witnesses described the structure and involvement of Consumers Power corporate management in the Midland Project. They discussed the formation and functioning of the recently reorganized Midland Project Quality Assurance Department ("MPQAD"). They detailed the broad corrective actions taken to remedy the soils quality assurance deficiencies. Finally, they described the role of independent consultants in helping

^{12/} Id.

^{13/} Tr. 1174.

them verify the adequacy of their quality assurance implementation and improve it.

38. The NRC Staff also presented evidence supporting their finding that Midland Project would be constructed with reasonable assurance toward health and safety. The principal personnel with the most direct involvement in the Midland Project from both the NRC Inspection and Enforcement (I&E) Division, Region III, and the Nuclear Reactor Regulation (NRR) Branch described their participation in the inspection and evaluations of the Project's quality assurance program from prior to the soils incident to the present.

39. Neither Consumers Power nor the Staff limited their presentations to the narrow scope of the soils quality assurance deficiencies. The presentations of both spanned all aspects of the Project. Our findings will not attempt to detail every aspect of the evidentiary presentations. We will, however, try to place these soils settlement related quality assurance findings within the context of the operation and implementation of the project-wide quality assurance program. A finding that there is reasonable assurance that future soils construction activities including any remedial measures will be implemented in accordance with NRC regulations can only be valid within this perspective.

(2) Consumers Power's Evidence Concerning
Corporate Management

41. In 1978, at the time of the discovery of the excessive settlement of the diesel generator building,

Stephen H. Howell was the Consumers Power corporate officer directly in charge of all aspects of the Midland Project.¹⁴ He assumed this responsibility in 1972 when he became Vice President, Electric Plant Projects^{15/} and retained this responsibility as Senior Vice President, Projects, Engineering and Construction until October 1980.^{16/} These positions involved both nuclear and non-nuclear construction activities.^{17/} By the beginning of 1980, Mr. Howell determined that a reorganization of the Midland Project management was necessary to assure that Consumers Power maintained a unified direction and control of the Project activities.^{18/} The purpose of the reorganization was to provide Consumers Power with more effective supervision of Bechtel's construction efforts.^{19/} This was accomplished by involving Consumers Power management more closely in Project design, scheduling and cost control.^{20/} Thus, the reorganization spanned all phases of the Project, including quality assurance operations

^{14/} Howell, prepared testimony at pp. 2-3, following Tr. 2802.

^{15/} Id.

^{16/} Id.; at present Mr. Howell, in his position as Executive Vice President, Energy Distribution and General Services, has no direct responsibility for the Project, id.

^{17/} Id.

^{18/} Howell, prepared testimony at p. 13, following Tr. 2802.

^{19/} Id.

^{20/} Id.

and various contractor organizations.^{21/} In March, 1980 Mr. James W. Cook assumed the title of Vice President for the Midland Project, a new executive level management position. As such, he became the senior Consumers Power official with sole and direct responsibility for the construction of the Midland plant.^{22/} In October, 1980, Mr. Cook assumed the title of Vice President Projects, Engineering and Construction.^{23/} His duties with respect to the Midland Project remained unchanged.

41. Mr. Cook described the benefits derived from the Project management reorganization. Notably, it increases Consumers Power involvement and control over the subtier activities in the contractor organizations.^{24/} Since Consumers Power Project personnel now deal more closely with the contractor activities, this means that decisions are made in a more timely fashion.^{25/} In addition, this increased contact provides for earlier identification of problems and attention to them by Consumers Power's management.^{26/} Finally, the closer contact helps sensitize Consumers Power

^{21/} Cook, prepared testimony at pp. 1, 6-7, following Tr. 1693.

^{22/} Id.

^{23/} Id.

^{24/} Cook, prepared testimony at pp. 6-7, following Tr. 1693.

^{25/} Id.

^{26/} Id.

to the specific problems encountered by contractor personnel. As a result, better working relationships and mutual respect can be developed, and a single team approach can be fostered within the entire project organization.^{27/}

42. Mr. Cook also discussed the extent of the day-to-day Consumers Power management involvement in quality assurance aspects of the Project. He described the various monthly and other Project management level meetings between Consumers Power, Bechtel and other contractors in which he participates.^{28/} These meetings which concern Project progress and problems, are either partially or totally devoted to quality assurance matters.^{29/} Further, there have been and continue to be ad hoc problem-solving sessions chaired by Mr. Cook which are directly related to quality assurance matters.^{30/}

43. It is clear that Consumers Power corporate involvement is not limited to Mr. Cook. There is considerable participation in the Project by Consumers Power's Chief Executive Officer, John Selby. Shortly after the Project reorganization, bi-weekly briefings were established for Mr. Selby on all aspects of the Project, specifically including quality assurance. The majority of these briefings take

^{27/} Id.

^{28/} Cook, prepared testimony at 9, following Tr. 1693.

^{29/} Id.

^{30/} Id.

place at the construction site and include plant tours. These meetings increase the level of information flow to Consumers Power's Chief Executive Officer and were added to the Chief Executive Officer's regularly scheduled meetings regarding the Midland Project.^{31/} In addition, Mr. Selby s become actively engaged in a major program to improve, project-wide quality implementation.^{32/}

(3) Consumers Power's Evidence Concerning
Midland's Quality Assurance Organization

44. A significant step in the reorganization of the Midland Project was the restructuring of the Project's quality assurance department, in August, 1980. This involved the integration of Consumers Power's Project quality assurance organization with Bechtel's, to form the MPQAD. The MPQAD now operates as the single quality assurance entity for the entire Project.^{33/} Thus the MPQAD is maintained under the direct control of Consumers Power management^{35/} while still supporting the Bechtel Project Manager's need

^{31/} Cook, prepared testimony at p. 9, following Tr. 1693.

^{32/} See infra at pp. 40-41.

^{33/} Cook, prepared testimony at p. 8, following Tr. 1693.

^{34/} Cook, prepared testimony at p. 8, following Tr. 6193; Bird, Tr. 3072.

^{35/} Marguglio, prepared testimony at p. 8, following Tr. 1424.

for quality assurance staff.^{36/} The MPQAD continues both the primary quality assurance function of the former Bechtel organization and the overview function of the former Consumers Power organization.^{37/} The integration provides a single-point accountability for implementation of the quality assurance program.^{38/} This promotes more timely and complete involvement of the quality assurance department in both preventive and corrective actions.^{39/}

45. Benjamin W. Marguglio, Director of Quality Assurance for Projects, Engineering and Construction for Consumers Power since 1977, described the MPQAD.^{40/} His responsibilities at Midland presently relate only to establishing and maintaining the quality assurance program and to quality auditing and training.^{41/} However, Mr. Marguglio's involvement in the development of the MPQAD provided a valuable perspective on the operation of the department.

46. In order to increase management involvement in the day to day quality assurance activities, the MPQAD is divided

^{36/} Cook, prepared testimony at p. 8, following Tr. 1693; Bird, Tr. 3072.

^{37/} Howell, prepared testimony at p. 9, following Tr. 1693; Bird, Tr. 3092, 3120.

^{38/} Howell, prepared testimony at p. 9, following Tr. 2802.

^{39/} Marguglio, prepared testimony at p. 10, following Tr. 1424; Marguglio, Tr. 1425-28.

^{40/} Marguglio, prepared testimony at pp. 4-10, following Tr. 1424; See Consumers Power Exhibit No. 13.

^{41/} Marguglio, prepared testimony at p. 1, following Tr. 1424.

into sections. The off-site sections report directly to the MPQAD manager, Mr. Bird.^{42/} Those sections located at the site are supervised by site Project Superintendent, a Consumers Power employee who in turn reports to Mr. Bird.^{43/} This permits quality assurance personnel to bring their concerns to the direct attention of management.^{44/} It facilitates the communication of quality assurance improvements from management to them and allows management to concentrate on corrective action.^{45/}

47. The creation of the MPQAD increased the size of the Project quality assurance department.^{46/} It also broadened the control of Consumers Power personnel over on-line Project activities.^{47/} The current MPQAD is staffed with 73 persons: 55 permanent and contract Consumers Power personnel and 18 Bechtel employees.^{48/} Moreover, six Consumers Power quality audit employees are exclusively devoted to the Midland Project.^{49/} The Consumers Power and

^{42/} Marguglio, prepared testimony at p. 9, following Tr. 1424; Consumers Power Exhibit No. 13.

^{43/} Marguglio, prepared testimony at p. 7, following Tr. 1424.

^{44/} Marguglio, prepared testimony at p. 4, following Tr. 1424.

^{45/} Id.

^{46/} Bird, Tr. 3128.

^{47/} Bird, Tr. 3120.

^{48/} Marguglio, prepared testimony at p. 9, following Tr. 1424; in addition to these 25 persons are part of the MPQAD quality assurance and quality control staff for the HVAC section, Consumers Power Exhibit No. 1; Bird, Tr. 3088-91.

^{49/} Id.

Bechtel employees within MPQAD sections are combined together.^{50/} The sole exception concerns personnel dealing with the ASME Code work relating to the Boiler and Pressure Vessel Code, who all work for Bechtel.^{51/} To ensure continual Consumers Power control over the project the MPQAD manager, Mr. Walter R. Bird, and a significant number of MPQAD section heads are Consumers Power employees.^{52/}

48. At our request a panel of Consumers Power and Bechtel personnel testified concerning the day to day functioning of the MPQAD.^{53/} We wanted a first-hand view of whether the new integrated quality assurance department was functioning effectively. Mr. Walter R. Bird, Manager of the MPQAD and a Consumers Power employee, Mr. John S. Rutgers, Bechtel's Project Manager, and Mr. Marion Dietrich, the Bechtel Project Quality Assurance Engineer, composed the panel.^{54/} Mr. Bird described the efforts exerted by the MPQAD to coordinate MPQAD activities with the construction schedule.^{55/} MPQAD utilizes long range construction schedules, available months ahead of time, in order to evaluate its

^{50/} Marguglio, Tr. 1527.

^{51/} Dietrich, Tr. 3122-24.

^{52/} Marguglio, prepared testimony at p. 9, following Tr. 1424.

^{53/} Tr. 3057-3205.

^{54/} Id.

^{55/} Bird, Tr. 3068-69.

resources and review personnel qualifications.^{56/} More specifically there are daily and weekly meetings between Bechtel quality control personnel, MPQAD and construction management site personnel to review the manpower needed to support ongoing work.^{57/} For example, with respect to soils work, there are current meetings between MPQAD, Consumers Power's and Bechtel's Project Teams, and Bechtel Quality Control personnel to analyze the number and qualifications of persons necessary for the quality control and quality assurance aspects of the remedial soils work.^{58/}

49. MPQAD has become more efficient than the dual Bechtel/Consumers Power organization which preceded it. The single entity provides less duplication of effort through better utilization of resources.^{59/} Although the MPQAD naturally experienced start up problems, Mr. Bird discerned no significant weakness in the organization now pertaining to the interaction between Consumers Power and Bechtel personnel.^{60/} Mr. Rutgers stated the new organization in fact assisted him in fulfilling his contract responsibilities by providing crisper and cleaner lines of communication.^{61/}

^{56/} Id.

^{57/} Id.

^{58/} Bird, Tr. 3070-71.

^{59/} Bird, Tr. 3128.

^{60/} Bird, Tr. 3187-88.

^{61/} Rutgers, Tr. 3122.

(4) Consumers Power's Evidence Concerning Improvements in the Quality Assurance Program and Its Implementation

50. Messrs. Marguglio, Bird, Rutgers and Dietrich also discussed significant improvements in the quality assurance program and its implementation. Among other things, efforts were made to improve the timeliness of corrective action responses to construction problems. Although not identified as a contributor to the soils settlement problems,^{62/} this has been a matter formally raised in various consultants', NRC and internal Consumers Power audits.^{63/} Several quality assurance systems have been initiated to improve response time. First, in the last quarter of 1979, the Bechtel Midland QA organization implemented a computerized tracking system to provide visibility and accountability i. closing out open quality assurance matters.^{64/} Second, and more recently, an additional change was made to this system. Now there is a separate truncated, prioritized list of open items which warrant special management attention.^{65/} The priorities are determined by an evaluation of the problem's technical importance, schedule impact and complexity.^{66/}

^{62/} Bird, Tr. 5148-52; See Staff Exhibit No. 4 (MAC Audit); Staff Exhibit No. 1 (NRC Inspection Report 81-12).

^{63/} Bird, Tr. 5125.

^{64/} Marguglio, prepared testimony at pp. 15-16, following Tr. 1424; Bird, Tr. 5125-26.

^{65/} Marguglio, prepared testimony at p. 16, following Tr. 1424.

^{66/} Bird, Tr. 5126; Marguglio, Tr. 1539-40; Marguglio, prepared testimony at p. 16, following Tr. 1424.

This list is circulated to responsible management personnel, including James Cook and John Rutgers, thus involving management directly in the resolution of significant quality related items.^{67/}

51. MPQAD has also involved itself in the review of supplier activities. In general, the Bechtel organization conducts the procurement and inspection of supplied hardware.^{68/} In August 1980, the MPQAD began an on-line review and approval of the disposition and closure of any requests from Bechtel suppliers which resulted in either a "use as is" or repair of the nonconforming item.^{69/} This now provides the MPQAD with greater control over the correction of the root causes of supplier nonconformances.^{70/} The MPQAD has also become involved with a review of supplier documents which verify fabrication processes.^{71/} In addition, the MPQAD is presently engaged in reviewing 100% of the workmanship on each type of supplied electrical hardware.^{72/}

52. Similarly, to alleviate concerns involving the identification of the root causes of nonconformances, the

^{67/} Bird, Tr. 5126; Marguglio, prepared testimony at p. 16, following Tr. 1424.

^{68/} Marguglio, Tr. 1541-42.

^{69/} Marguglio, prepared testimony at p. 18, following Tr. 1424.

^{70/} Marguglio, prepared testimony at p. 19, following Tr. 1424.

^{71/} Id. at 27; Staff Exhibit No. 4 at pp. 5-6, 9, 127.

^{72/} Bird, Tr. 5193.

"trend analysis" program was restructured. Trend analysis involves categorization of construction nonconformances by performance area and the type of nonconformance.^{73/} It is meant to detect subtle changes in conditions in the plant workmanship over a period of time.^{74/} The nonconformances are grouped; the number occurring in each area over a period of time is counted. From this an adverse "trend" or undesirable frequency of nonconformances can be determined.^{75/}

53. In 1977, the categories into which nonconformances were trended were expanded to 30.^{76/} In addition, a system of distributing the trend reports to both Bechtel and Consumers Power management was instituted. In 1978, at the recommendation of the NRC, Phase 2 of the Trend Analysis Program was developed. In this phase nonconformances were reformulated into four classifications of defects so that broad trends could be identified.^{77/} In 1981, the program was re-examined at the direction of Mr. Donald Turnbull, the MPQAD Midland site quality assurance superintendent.^{78/} Mr. Turnbull and the department supervisors under him identified

^{73/} Marguglio, prepared testimony at p. 35, following Tr. 1424.

^{74/} Turnbull, Tr. 4282.

^{75/} Marguglio, prepared testimony at p. 35, following Tr. 1424.

^{76/} Marguglio, prepared testimony at p. 36, following Tr. 1424.

^{77/} Id.

^{78/} Turnbull, Tr. 2762-63, 2765.

several areas of concern which culminated in the development of Phase 3 of the Trend Analysis program.^{79/} Phase 3 will run concurrently with Phase 2 until its worth is proven. It expands the categorizations to 8 areas to provide a better matrix for classification.^{80/} It also defines the categories more explicitly so that there is a uniformity in identifying the type of nonconformances.^{81/} Finally, it defines the type of analysis necessary to be used in identifying trends, again to assist in uniformity.^{82/} The trending program as currently implemented has been effective in recognizing several construction problems.^{83/}

(5) Consumers Power Evidence Concerning Corrective
Actions for Soils Settlement Problems

54. The Modification Order asserts that a breakdown in quality assurance in the certain soils construction activities contributed to the settlement problems. As a part of his testimony, Mr. Marguglio attached the Consumers Power's Response to the NRC 10 CFR §50.54(f) Questions 1 and 23^{84/}

^{79/} Turnbull, Tr. 2773-74.

^{80/} Id.; Consumers Power Exhibit No. 12.

^{81/} Id.

^{82/} Id.

^{83/} Turnbull. Tr. 4283-84; see Marguglio prepared testimony at pp. 10 to 37, following Tr. 1424 for a complete description of the quality assurance program and implementation improvements recently instituted.

^{84/} Marguglio, prepared testimony, Attachment Nos. 9-10, following Tr. 1501.

which identify the deficiencies, explain their import and explore their specific programmatic and generic implications. The responses also detail the corrective actions taken to remedy and prevent further deficiencies.^{85/} The response to 10 CFR §50.54(f) Question 1 was submitted to the NRC in April, 1979.^{86/} The response to 10 CFR §50.54(f) Question 23 was submitted in November 1979 and has been amended as specific commitments to corrective actions have been completed.^{87/}

55. Part I of the response to Question 23 identifies 13 specific quality assurance deficiencies related to the soils settlement and the actions taken by Consumers Power to remedy them. Each is addressed with the same intensive effort, irrespective of its contribution to the cause of the settlement.^{88/} The deficiencies which significantly contributed to the soils settlement relate to the use of soils compaction equipment and an over-reliance on soil test results.^{89/} The thirteen deficiencies are:^{90/}

^{85/} Id.

^{86/} Marguglio, prepared testimony, Attachment No. 9, following Tr. 1501.

^{87/} Marguglio, prepared testimony, Attachment No. 10, following Tr. 1501.

^{88/} Marguglio, prepared testimony, Attachment No. 10 at p. 23-3, following Tr. 1501.

^{89/} Id.

^{90/} Marguglio, prepared testimony, Attachment No. 10 at pp. 23-1 to 23-36, following Tr. 1501.

1. A deficiency was identified in the possible interpretation resulting from the attachment of the Dames & Moore Consulting Report to the Preliminary Safety Analysis Report (PSAR). The information contained in the consultant report which conflicted with PSAR information could have been misconstrued as a construction commitment. Procedures were revised to preclude repetition of similar deficiencies. Action was initiated to insure that no other inconsistencies existed between the construction specifications in the FSAR and other consultant reports. Consultant Reports will not be attached to the SAR but portions of them are to be extracted and incorporated into the FSAR text. A program was instituted to re-review the Final Safety Analysis Report (FSAR) commitments to assure that the commitments adequately reflected project design documents. (Part 2 of Consumers Power Response to Question 23 more fully describes this.)^{91/}
2. A deficiency was identified in a conflict that existed between sections of (construction) specifications relating to a laboratory standard. Interoffice memoranda, memoranda, telexes, TWX's etc. had been used to clarify the intent of the specifications. These clarifications may have been interpreted as modifying the specifications without formally changing the wording. Midland Project personnel were re-instructed concerning the procedurally correct method of implementing specification changes. A review of interoffice memoranda, telexes, etc. was conducted to determine if any had informally modified a specification requirement. Instructions were revised to prohibit such communication methods from changing the requirements of a specification.^{92/}

^{91/} Id. at 23-6, 23-7.

^{92/} Marguglio, prepared testimony, Attachment No. 10, at pp. 23-8 to 23-9 and Part 3, p 23-80; Marguglio, prepared testimony, Attachment No. 9, Appendix I, Section D.2.b-c, at p. I-8, following Tr. 1501.

A specific review of the FSAR and specification requirements for the qualification of electrical and mechanical components was made part of the corrective action relating to Consumers Power 50.55(e) report on component qualification.93/

3. A quality assurance deficiency was identified involving inconsistency with the FSAR relating to diesel generator building fill material and settlement.94/ FSAR Revision 18 corrected this. A study was conducted examining procedures and practices for the preparation and control of the FSAR and necessary procedural changes were made. Instructions were revised to review all specification changes for consistency with the FSAR. A review and update of the PSAR Commitment List was completed and a complete re-review of the FSAR was done.95/
4. A deficiency was identified in that the final diesel generator building design configuration (as described in the FSAR) differed from the preliminary information. It was subsequently determined that the change in design would have an insignificant effect on the settlement calculations.96/ Settlement calculations after the completion of the diesel generator building surcharge operation were revised. Personnel were alerted of the need to revise or annotate calculations to reflect current design status and proce-

93/ Id.; See Marguglio, prepared testimony, Attachment No. 10, Part 3, at p. 23-8, following Tr. 1501; Marguglio, prepared testimony, Attachment No. 9, Appendix I, Section D.2.C. p. 1-8, following Tr. 1501.

94/ Marguglio, prepared testimony, Attachment No. 10, at p. 23-10 to 23-13, following Tr. 1501.

95/ Id.; See also Marguglio, prepared testimony, Attachment No. 10, Part 2, following Tr. 1501.

96/ Marguglio, prepared testimony, Attachment No. 10, at pp. 23-12 to 23-13, following Tr. 1501.

dures were revised to require that calculations be annotated to reflect current design status. Action was taken to determine if this was an isolated case. Quality Assurance audits of Geotechnical Services done in February and August 1979 determined it was. Quality Engineering surveys and Quality Assurance monitoring were instigated to verify the future coordination of design documents by Geotechnical Services and Project Engineering.^{97/}

5. A deficiency was identified in that four vertical duct banks were designed and constructed without sufficient clearance to allow for relative vertical movement between the duct banks and the building footings.^{98/} Provisions were made to allow independent vertical movement between the diesel generator building and the duct banks. Bechtel Project Engineering reviewed similar electrical duct banks. Modification design criteria required that a duct bank penetration be designed to eliminate the possibility of detrimental interaction with the structure. Drawings were revised to show horizontal and vertical clearance requirements for duct bank penetrations. Audits in the area of design coordination were conducted to assure there were no generic problems.^{99/}
6. A deficiency was identified in the insufficient compactive effort used in the backfill operation. The reason for this was that reliance put on the result of soils placement tests.^{100/} The compaction equipment was qualified.

^{97/} Id.

^{98/} Marguglio, prepared testimony, Attachment No. 10, at pp. 23-14 to 23-16, following Tr. 1501.

^{99/} Id.

^{100/} Marguglio, prepared testimony, Attachment No. 10, at pp. 23-17 to 23-18, following Tr. 1501.

Construction personnel were notified of the parameters governing the use of this equipment. Field instructions were revised to establish requirements for demonstrating and qualifying equipment. In addition, instructions were revised to include verification of the use of qualified equipment and compliance with qualified procedures. A Nuclear Quality Assurance Manual amendment to clarify the measures for qualifying equipment under specified conditions was prepared.101/

7. A deficiency was identified in the insufficient technical direction in the field.102/ Remedial action was taken by assigning a full-time onsite Geotechnical Soils Engineer to provide technical direction and monitor the process. Instructions established responsibilities for performing soils placement and compaction. Pertinent procedures were reviewed for clarity.103/ A review of design documents, instructions, and procedures for those activities which require in-process controls was conducted.104/
8. A deficiency was identified with respect to inadequate Quality Control inspection of the placement of fill caused by the lack of sufficient specificity in requirements for the preparation of inspection instructions.105/ Instructions were revised to incorporate the specific characteristics to be

101/ Id.

102/ Marguglio, prepared testimony, Attachment No. 10, at pp. 23-19 to 23-20, following Tr. 1501.

103/ Id.; See also Marguglio, prepared testimony, Attachment No. 10, Part 3, at p. 23-80, and Attachment No. 9, Appendix I Section 0.2, following Tr. 1501.

104/ Marguglio, prepared testimony, Attachment No. 10, at pp. 23-20.

105/ Marguglio, prepared testimony, Attachment No. 10, at pp. 23-21 to 23-22.

verified. An in-depth soils investigation program was instituted to provide verification of the acceptability of the soils or identify any nonconformance requiring further remedial action. The requirements were revised to provide for inspection planning specificity and for the utilization of scientific sampling rather than percentage sampling. An ongoing over-inspection program in the soils area was instituted.^{106/} In addition, there were ongoing reviews to clarify the following areas: field procedures, QCIs, the adequacy of construction and the Bechtel inspection process, and the adequacy of onsite subcontractor QA manuals.^{107/}

9. A deficiency was identified in inadequate soil moisture testing in that a control document did not require sufficient specificity for establishing an inspection program and for the preparation of inspection instructions.^{108/} The specifications were revised to provide more definitive requirements for soil moisture testing and verification. Revisions were provided for inspection planning specificity and for the utilization of scientific sampling rather than percentage sampling. Instructions were revised to provide controlled and uniform interpretation of specification requirements. Personnel were reinstructed concerning the procedurally correct methods of implementing specification changes. A review of Quality Control Instructions ascertained that provisions were consistent with the revised control document.

^{106/} Marguglio, prepared testimony, Attachment No. 10, Part 3, at p. 23-89; Attachment No. 9, Appendix I, Section C.2.b. at p. I-11; Section C.1.c. at p. I-16, following Tr. 1501.

^{107/} Marguglio, prepared testimony, Attachment No. 10, Part 3, at p. 23-90; Attachment No. 9, Appendix A, Section D.5.b-e at p. I-19, following Tr. 1501.

^{108/} Marguglio, prepared testimony, Attachment No. 10, at pp. 23-23 to 23-25, following Tr. 1501.

A review of interoffice memoranda, telexes, etc. relating to specifications for construction and selected procurements of Q-listed items ensured that no informal clarifications modified a specification requirement.^{109/}

10. A deficiency was identified in the incorrect soil test results because surveillance and test report reviews did not identify errors and inconsistencies.^{110/} The type of testing errors made were identified. The requirements for the control of testing were adjusted and a specification change issued. More stringent requirements for in-process inspection of U.S. Testing's soil testing activities were instituted. An in-depth soils investigation program provided verification of the acceptability of the soils and identified any nonconformances requiring further remedial action. Guidelines for the surveillance of testing operations were developed and included in the Field Instructions. U.S. Testing was required to demonstrate that testing procedures, equipment, and personnel used for quality verification testing (for other than NDE and soils) were, and are, capable of providing accurate test results. U.S. Testing's test reports were sampled to ascertain that results evidence conformance to testing requirements. An evaluation of Quality Control Instructions ensured that the documentation characteristics to be inspected (i.e., surveillance and review callouts) were clearly specified. These revisions to instructions were made where necessary.^{111/} Specific over-inspection of the U.S. Testing soils

^{109/} Id.

^{110/} Marguglio, prepared testimony, Attachment No. 10 at pp. 23-26 to 23-28, following Tr. 1501.

^{111/} Id.; Marguglio, prepared testimony, Attachment No. 10, Part 3 at p. 23-89 and Attachment No. 9, Appendix I, Section C.3.c at p. I-17, following Tr. 1501.

testing activities and reports, utilizing a specific plan, was instituted.112/

11. A deficiency was identified in inadequate subcontractor test procedures.113/ The requirements for the control of testing were adjusted and a specification change was issued. A full-time onsite Geotechnical Soils Engineer was assigned to review U.S. Testing's procedures and monitor their implementation. Field instructions established responsibility for performing surveillance of testing operations. A review of design documents, instructions, and procedures for those activities requiring in-process controls to assess the adequacy of existing procedural controls and technical direction was conducted. Consumers Power implemented an over-inspection plan to independently verify the adequacy of construction and the Bechtel inspection process with the exception of civil activities.114/ Consumers Power, also, reviewed on-site subcontract QA manuals and covers their work in the audit process.115/
12. A deficiency was identified in inadequate corrective action for repetitive nonconforming conditions in that the conditions under which nonconformances are considered to be repetitive were not adequately defined in the control

112/ Marguglio, prepared testimony, Attachment No. 10 at p. 23-28 and Part 3 at p. 23-82 and Attachment No. 9, Appendix I, Section D.3.a, at p. I-18 and Section D.1 at p. I-18, following Tr. 1501.

113/ Marguglio, prepared testimony, Attachment No. 10 at pp. 23-29 to 23-31, following Tr. 1501.

114/ Marguglio, prepared testimony, Attachment No. 10, Part 3 at p. 23-90, Attachment No. 9, Appendix I, Section D.5.c at p. I-19, following Tr. 1501.

115/ Marguglio, prepared testimony, Attachment No. 10, Part 3 at p. 23-90 and Attachment No. 9, Appendix I, Section D.5.d at p. I-9, following Tr. 1501.

documents.^{116/} These were revised to provide an improved definition of implementing requirements for identifying repetitive nonconforming conditions. An in-depth training session was given to Midland QA Engineers covering the settlement problem and methods to identify similar conditions in the future.^{117/} An in-depth review of the trend program data was undertaken to ensure the identification of any other similar areas that were not analyzed in sufficient depth in the past reviews.^{118/}

13. A deficiency was identified in inadequate quality assurance auditing and monitoring of plant fill work activities. It was found that auditing and monitoring were oriented more toward evaluating the degree of compliance with established procedures than toward the assessment of policy and procedural adequacy or toward the assessment of product quality.^{119/} Consumers Power revised the Quality Assurance audit and monitoring program to emphasize the need for evaluating policy and procedural adequacy and assessment of product quality. A specialized audit training program was developed to implement guidance for this. In addition, an in-depth training session was given to all Consumers Power and Bechtel QA Engineers and Auditors to increase their awareness of the settlement problem and to discuss auditing

^{116/} Marguglio, prepared testimony, Attachment No. 10, at pp. 23-32 to 23-33, following Tr. 1501.

^{117/} Marguglio, prepared testimony, Attachment No. 10, Part 3 at p. 23-81, Attachment No. 9, Appendix 1, Section D.1. b at p. I-22, following Tr. 1501.

^{118/} Marguglio, prepared testimony, Attachment No. 10, Part 3 at p. 23-82; Attachment No. 9, Appendix 1, Section D.1. at p. I-22, following Tr. 1501.

^{119/} Marguglio, prepared testimony, Attachment No. 10, at pp. 23-34 to 23-35, following Tr. 1501.

and monitoring techniques to increase audit effectiveness.^{120/}

52. Part 2 of Consumers Power's Response to 10 CFR §50.54(f) Question 23 detailed the examination or "re-review" Consumers Power undertook to assure the validity of the FSAR.^{121/} During the course of the re-review over 1,000 sections of the FSAR were re-inspected to determine whether its commitments were consistent with the plant design.^{122/} Consumers Power performed three specific audits to verify the accuracy of the effort.^{123/} The audit conducted in March 1980 with two-thirds of the re-review completed identified a procedural irregularity. However, it was confirmed that the purpose of the re-review was being fulfilled.^{124/} The second and third audits also verified that the re-review was adequate.^{125/}

56. In Parts 3 and 4 of Consumers Power Response to the NRC's 10 CFR §50.54(f) Question 23, Consumers Power outlined why the quality assurance deficiencies in the soils areas did not have significant generic implications to the remainder of the quality assurance program and its implementa-

^{120/} Marguglio, prepared testimony, Attachment No. 10, Part 3 at p. 23-82 and Attachment 9, Appendix I, Section D.2 at p. I-22, following Tr. 1501.

^{121/} Marguglio, prepared testimony, Attachment No. 10, Part 2 at pp. 23-37 to 23-48, following Tr. 1501.

^{122/} Id., Landsman, Tr. 4848.

^{123/} Bird, Tr. 3147-48.

^{124/} Bird, Tr. 3147; Landsman, Tr. 4849.

^{125/} Bird, Tr. 3147-48; Landsman, Tr. 4849-51.

tion.^{126/} These sections explain the differences between soils and other work and provide a list of several commitments made to assure such confidence.^{127/} Two-thirds of these commitments and those made in Consumers Power's Response to NRC 10 CFR §50.54(f) Question 1 have been completed, inspected by the NRC and successfully closed out.^{128/}

(6) Consumers Power's Evidence Concerning
Consultant Reports and Recommendations

57. In order to independently verify the effectiveness of the implementation of their quality assurance program and to improve it, Consumers Power sought the special assistance of two outside consulting firms. The Management Analysis Co. (MAC) was engaged in March 1981 to perform an extensive assessment of the adequacy of the implementation of corrective actions taken by the MPQAD in past years.^{129/} Consumers Power also hired Philip Crosby and Associates, a quality consulting firm, to improve the entire Project's approach toward quality implementation.^{130/}

^{126/} Marguglio, prepared testimony, Attachment No. 10, Part 3 at pp. 23-50 to 2-90, following Tr. 1501.

^{127/} Id.

^{128/} Gallagher, NRC Staff prepared testimony in response to Stamiris Contention No. 3, Attachment No. 3, following Tr. 1754.

^{129/} Marguglio, prepared testimony at pp. 37-38, following Tr. 1424; Marguglio, Tr. 1532-33.

^{130/} Cook, prepared testimony at p. 17, following Tr. 1693; Gilray, Tr. 3801.

58. In May 1981, MAC completed a three month special audit of the MPQAD's implementation of the quality assurance program.^{131/} The MAC team consisted of eight auditors who specifically assessed three areas of a quality assurance program implementation. First, they reviewed the adequacy and timeliness of corrective actions involving Consumers Power Company 10 C.F.R. §50.55(e) reports to the NRC.^{132/} Second, they examined the degree to which supplied components meet quality requirements.^{133/} Third, they evaluated the overall adequacy of the Quality Assurance Program, including an assessment of MPQAD corrective actions, supplier documentation review efforts, testing activity and personnel qualifications.^{134/}

59. The MAC overall assessment found that the MPQAD program implementation is "somewhat above average" for the nuclear industry,^{135/} particularly in comparison to plants started at the same time as Midland.^{136/} Specifically, it found that the quality assurance program met NRC requirements and was adequate for the control of safety related hardware.^{137/} It was the auditors' view that the MPQAD

^{131/} Marguglio, Tr. 1532.

^{132/} Staff Exhibit No. 4 at p. 1.

^{133/} Id.

^{134/} Id.

^{135/} Id. at p. 10.

^{136/} Id.

^{137/} Id.; Marguglio Tr. 1532-33.

correctly identified the root cause of quality problems and with few exceptions, adequately addressed the problems' specific and generic implications.^{138/} The MAC assessment found the Consumers Power and Bechtel quality assurance personnel properly qualified for their tasks. It rated the completeness of their qualification information as superior.^{139/} The auditors observed that the quality assurance program may require further action in the area of timeliness of implementing the corrective actions.^{140/}

60. Walter Bird, the MPQAD Manager, testified that Consumers Power was aware of a need to improve the timeliness of the implementation of corrective actions. He described measures taken by Consumers Power both before and after the MAC Audit to improve the MPQAD performance in the area.^{141/} Mr. Bird outlined the actions by the MPQAD and Consumers Power's quality assurance audit section to assure that each of the specific findings and action items identified in the MAC Audit were included within the regular MPQAD process for corrective action.^{142/}

60. In an effort to further foster quality awareness Consumers Power has retained the Philip Crosby & Associates

^{138/} Staff Exhibit No. 4, at p. 8.

^{139/} Id. at p. 10.

^{140/} Id. at p. 9.

^{141/} Bird, Tr. 5119-5200.

^{142/} Bird, Tr. 5119-5200.

firm.^{143/} Mr. Crosby is a nationally known quality consultant who is assisting Consumers Power and Bechtel develop a specialized quality improvement program.^{144/} In the initial stage of the Crosby program, fourteen senior management officials from Consumers Power and Bechtel, including among others, John Selby, James Cook, Benjamin Marguglio, and Walter Bird from Consumers Power Company, and Howard Wahl and John Rutgers from Bechtel, participated in a two day seminar conducted by Mr. Crosby and his associates.^{145/} In this seminar they learned techniques he developed for communicating quality objectives.^{146/} Later, still more extensive seminars were conducted with Consumers Power and Bechtel middle management teams.^{147/} In November of this year, with the visible involvement of Mr. Selby and Mr. Wahl and other senior management officials from both Consumers Power and Bechtel, an all-inclusive project-wide quality campaign will be introduced to all employees.^{148/}

(7) Staff Assessments of Consumers Power Company
Management and MPQAD

61. All the NRC officials who testified concerning quality assurance agreed that there is reasonable assurance

^{143/} Cook, Tr. 2507; Cook, prepared testimony at p. 17, following Tr. 1693.

^{144/} Cook, Tr. 2516-17.

^{145/} Bird, Tr. 5213.

^{146/} Cook, Tr. 2517.

^{147/} Bird, Tr. 5213.

^{148/} Bird, Tr. 5220-24; 5235-56.

that the Midland quality assurance program is and will be appropriately implemented. This includes Region III's Inspection and Enforcement Branch officials who have the responsibility for evaluating the implementation of the quality assurance program:^{149/} Mr. James Keppler, the Director of Region III,^{150/} and the inspectors for the Region most involved with Midland, Mr. Cordell Williams,^{151/} Dr. Ross Landsman,^{152/} and Mr. Eugene J. Gallagher.^{153/} It also included John Gilray, the official from the NRR Branch of the NRC charged with evaluating the quality assurance program^{154/} and Darl S. Hood the NRC's Manager of the Project.^{155/} Each member of the NRC Staff who testified explicitly discussed the bases for their reasonable assurance finding. They described both the strength and the weaknesses they perceived in the quality assurance program implementation. This was done to permit the Licensing Board to evaluate the substance of their judgment.^{156/}

^{149/} Keppler, Tr. 1870-71.

^{150/} Keppler, prepared testimony at pp. 8-9, following Tr. 1864; Keppler, Tr. 1913, 1981-83, 2018.

^{151/} Williams, Tr. 2229, 2245-56.

^{152/} Landsman, Tr. 4905-06.

^{153/} Gallagher, Tr. 2452-55.

^{154/} Gilray, Tr. 3788-90, 3777, 3871.

^{155/} Hood, Tr. 4370-72.

^{156/} See, e.g., Keppler Tr. 2000.

(8) Staff Assessment of Consumers Power
Corporate Management

62. The Staff expressed substantial confidence in the capabilities of the present Consumers Power management to fulfill its quality assurance commitments. Director Keppler stated that he viewed the management reorganization effort at Midland "as [a] positive management commitment to further improve the effectiveness of the quality assurance."^{157/} Director Keppler noted that past commitments by Consumers Power management had been kept.^{158/} This weighed heavily in his evaluation.^{159/}

63. Mr. Gallagher concurred in Director Keppler's assessment of Consumers Power management.^{160/} It was his opinion that the current management attitude is consistent with the adequate implementation of quality assurance with respect to the resolution of the soils settlement problem.^{161/} Although Mr. Gallagher expressed dissatisfaction with former Consumers Power management,^{162/} he acknowledged that the past deficiencies he cited had been recognized by that

^{157/} Keppler, prepared testimony at p. 9, following Tr. 1864.

^{158/} Keppler, Tr. 2075.

^{159/} Keppler, Tr. 1977-78.

^{160/} Gallagher, NRC Staff prepared testimony in response to Stamiris Contention No. 3 at p. 5, following Tr. 1754; Gallagher, Tr. 2333.

^{161/} Gallagher, Tr. 2590-94.

^{162/} Gallagher, Tr. 2307-08.

management and corrected.^{163/} The appointment of James Cook to head the Midland Project and Mr. Cook's day to day involvement in Project decisions was a major basis for Mr. Gallagher's present opinion.^{164/}

64. John C. Gilray stated that his confidence in the quality assurance program and its integrity were heightened with the recent organization changes. The appointments of Mr. Cook and Mr. Rutgers and the involvement of Mr. Selby further bolstered this confidence.^{165/} He underscored the willingness of both Bechtel personnel and Consumers Power management to participate in the Crosby Associates quality improvement program. He identified this as an excellent indicator of management's ability to fulfill its quality assurance commitments.^{166/} In addition, Mr. Gilray cited the improved relationship between the NRC and senior officials of both Bechtel and Consumers Power as evidence of strong management support to the quality assurance effort.^{167/}

65. It is the position of the Staff that the corporate management now responsible for the Midland Project is structured so that it adequately meets NRC regulations.^{168/} Two

^{163/} Gallagher, Tr. 2420-21.

^{164/} Gallagher, Tr. 2334.

^{165/} Gilray, Tr. 3717, 3875-76, 3790.

^{166/} Gilray, Tr. 3715, 3753.

^{167/} Gilray, Tr. 3754.

^{168/} Keppler, Tr. 2053-54.

members of the NRC Staff, Mr. Gilray and Mr. Gallagher, however, speaking only for themselves, and not NRC management,^{169/} made a further suggestion. They thought it would be desirable if Mr. Selby, Consumer Power's Chief Executive Officer, reported directly to the NRC concerning the resolution of the soils issue. Mr. Gallagher felt some sort of routine reporting by Mr. Selby could be helpful.^{170/} He thought that this would mean that a corporate officer would be held personally responsible for the future work.^{171/} Mr. Gilray believed that this sort of reporting would give the staff confidence that Mr. Selby would execute his assigned responsibilities.^{172/} He, however, would condition it on a concurrent requirement that the senior NRC management respond specifically to Mr. Selby's report.^{173/} However, both Mr. Gilray and Mr. Gallagher had confidence in the project organization and ability of Mr. Cook, the senior Consumers Power officer now personally accountable for the Project.^{174/}

(a) Staff Assessment of Consumers Power
Quality Assurance Program and Organization

66. Messrs. Gilray, Keppler and Gallagher emphasized that the adequacy of the Midland quality assurance program

^{169/} Gallagher, Tr. 2439; Gilray, Tr. 3850.

^{170/} Gallagher, Tr. 2439.

^{171/} Gallagher, Tr. 2440.

^{172/} Gallagher, Tr. 3878.

^{173/} Gilray, Tr. 3851-54, 3877.

^{174/} Gallagher, Tr. 2334; Gilray, Tr. 3875-76, 3878.

has never been questioned by the NRC.^{175/} The program was reviewed several times by the NRC. Consumers Power revised and improved it over the years to comply with stricter NRC standards.^{176/} The NRC reviews have always found the quality assurance program adequate.^{177/}

67. The Staff witnesses testified that the MPQAD, in uniting both the Consumers Power and Bechtel quality assurance entities, "had formed an effectively integrated and coordinated construction and quality management team."^{178/} This finding was based on their continuing evaluation of quality assurance implementation from before the Modification Order was issued to the present.^{179/} The evaluation demonstrated that even prior to 1979, the overall quality assurance implementation was adequate.^{180/} The new integrated organization was an added improvement.^{181/} The conclusion was verified by the NRC in its own inspection of the operation of the organization in May 1981.^{182/} Its

^{175/} Gilray, prepared testimony at p. 2, following Tr. 3718; Gilray, Tr. 3834; Keppler, prepared testimony at p. 9, following Tr. 1864; Gallagher, Tr. 2291.

^{176/} Gilray, Tr. 3834; Keppler, Tr. 2075-76.

^{177/} Keppler, Tr. 2075-76; Gallagher, Tr. 2291.

^{178/} Keppler, prepared testimony at p. 7, following Tr. 1864.

^{179/} Keppler, prepared Tr. 1975-76, 1882.

^{180/} Keppler, Tr. 1975-76.

^{181/} Id.; Gilray, Tr. 3714.

^{182/} Keppler, prepared testimony at pp. 7-8, following Tr. 1864.

confidence was further confirmed by the extensive audit performed by the MAC team.^{183/} According to Mr. Gilray, the MAC audit was done by some of the best quality assurance engineers in the industry.^{184/} This added considerably to the value of the auditors' favorable assessment of the quality assurance implementation.^{185/} Although the MAC audit outlined some areas of weakness in the quality assurance program, in Mr. Gilray's opinion, none was of a substantial nature.^{186/}

68. In discussing the possible disadvantages of the integrated organization, Mr. Gilray cited potential ambiguities concerning commercial risk allocation^{187/} and internal dissension.^{188/} No evidence was presented, however, that any of these problems actually exist.^{189/} Mr. Gilray also agreed that the advantages in the MPQAD organizational structure outweighed any possible disadvantages.^{190/} Finally, the reporting procedure whereby the manager of the MPQAD, Walt Bird, reported directly to James

^{183/} Keppler, Tr. 1992, 2143.

^{184/} Gilray, Tr. 3841-42.

^{185/} Gilray, Tr. 3841-42.

^{186/} Gilray, Tr. 3715-16.

^{187/} Gilray, Tr. 3849, 3875.

^{188/} Gilray, Tr. 3875.

^{189/} Id.

^{190/} Gilray, Tr. 3849.

Cook, the Consumers Power Vice President with responsibilities for Project costs and scheduling, was determined to be in accordance with the NRC requirements set forth in 10 CFR Part 50, Appendix B.^{191/}

(10) Staff Assessment of the Implementation of the Quality Assurance Program

69. Although citing the overall effectiveness of the Project's quality assurance implementation, Director Keppler stated that two notable quality related problems had been identified since the Modification Order.^{192/} The first problem related to the failure of anchor bolts in the reactor pressure vessel.^{193/} The problem originated in 1973 when the bolts, manufactured by a vendor in 1975, were inadequate heat treatments.^{194/} Upon installation in 1979, the bolts fractured after being put under tension.^{195/} This was the first opportunity to discover the problem after the procurement.^{196/} The MPQAD is currently engaged in an extensive supplied-items evaluation effort, including improved surveillance of fabrication.^{197/} The second quality related

^{191/} Keppler, Tr. 2053-54.

^{192/} Keppler, prepared testimony at p. 4, following Tr. 1864.

^{193/} Id.

^{194/} Id.; Keppler, Tr. 2039.

^{195/} Id.; Keppler, Tr. 2039.

^{196/} Keppler Tr. 1964-65 and 2039.

^{197/} Staff Exhibit No. 4; Marguglio, prepared testimony at pp. 25-30, following Tr. 1424.

problem involved the work and inspections of the Zack Corporation, an onsite subcontractor for the plant HVAC system.^{198/} The MPQAD has effectively assumed all quality assurance functions from the subcontractor in order to assure that the work is satisfactorily performed.^{199/} In addition they perform the initial quality control inspections.^{200/}

(11) Staff Assessment of Soils Quality Assurance
Corrective Actions

70. The particular corrective actions, both specific and generic, taken by Consumers Power with respect to the soils related quality assurance differences were acceptable to the Staff. They determined that the detailed answers supplied by Consumers Power in its response to 10 CFR §50.54(f) Question 23 adequately addressed concerns involving root cause identification and appropriate specific and generic corrections of the problems.^{201/} Mr. Gilray testified that his initial reluctance to accept Consumers Power's response to Question 23 related only to a lack of documentation of the actions taken to support its commitments.^{202/} Once he received verification of the effective implementation of the

^{198/} "HVAC" indicates the quality related Heating, Ventilating and Air Conditioning system for the plant.

^{199/} Bird, Tr. 3088-92.

^{200/} Id.

^{201/} Gilray, Tr. 3709, 3739-42.

^{202/} Gilray, Tr. 3712; 3835-36, 3763.

quality assurance program through the MAC report,^{203/} the hiring of Philip Crosby and Associates^{204/} and an update from Consumers Power on its quality assurance program improvements,^{205/} Mr. Gilray considered the Consumers Power response to Question 23 satisfactory.^{206/}

71. Mr. Gallagher testified that he found the quality assurances corrections with respect to the soils work satisfactory.^{207/} In particular, soils testing safeguards have been in place since 1980; Mr. Gallagher had confidence that these procedures will be appropriate in the future.^{208/} Finally, Mr. Gallagher stated that the subcontractors charged with performing the remedial soils work are fully capable of performing such work successfully.^{209/}

(12) Staff Inspections

72. The NRC conducted several extensive inspections to verify the effectiveness of the Midland quality assurance program implementation. In particular, these investigations covered the periods during some soils placement in 1977,

^{203/} Gilray, Tr. 3712-13.

^{204/} Id.

^{205/} Id.

^{206/} Id.; Gilray, Tr. 3709.

^{207/} Gallagher, Tr. 2590.

^{208/} Id.

^{209/} Gallagher, Tr. 2439.

after the soils problems were discovered in 1978^{210/} and after the issuance of the Modification Order.^{211/} The results of these investigations verified that there had been no overall quality assurance breakdown at Midland.^{212/} Investigations conducted subsequent to the Modification Order confirmed that Consumers Power's quality assurance program and its implementation had been improved and strengthened to meet the problems identified during the soils settlement investigations.^{213/}

73. In 1977, five NRC Region III inspectors inspected the Midland site.^{214/} Their consensus was that although some noncompliances with 10 CFR Part 50, Appendix B criterion were identified, the quality assurance "program and its implementation for Midland were considered to be adequate."^{215/} In December, 1978, Director Keppler wrote a letter responding to concerns about Midland quality assurance implementation raised by the soils settlement problems. In this letter, Mr. Keppler stated that quality assurance deficiencies "were isolated rather than generic in nature, were

^{210/} Consumers Power Exhibits Nos. 4, 5 and 6.

^{211/} NRC Staff prepared testimony in response to Stamiris Contention No. 3, Attachment Nos. 3 and 4; Staff Exhibit No. 1.

^{212/} Keppler, Tr. 1975-76; 1882, Board Exhibit No. 1(a), at pp. 10, 13.

^{213/} Gilray, Tr. 3714; Keppler, Tr. 1976.

^{214/} Board Exhibit No. 1(a), at p. 10.

^{215/} Id.

resolved in a responsible manner and did not represent a serious breakdown in quality assurance."216/

74. In October 1978217/ and December 1978-January 1979,218/ Mr. Gallagher conducted investigations into the soils settlement problems. He concluded that several quality assurance deficiencies contributed to the problems.219/ In February 1979, after Mr. Gallagher's investigations,220/ and in conjunction with an NRC meeting in Washington, Director Keppler prepared a summary of Region III's assessment of Midland's quality assurance implementation.221/ This summary represents the consensus of all the Region III inspectors involved with the Midland Project and Director Keppler.222/ It identifies two "common threads" concerning the quality assurance deficiencies experienced at Midland: Consumers Power's overreliance on Bechtel and an insensitivity on the part of both organizations to the generic implications of an incident.223/ However, the report reemphasizes that the quality assurance problems at Midland, including those associated with soils settlement,

216/ Consumers Power Exhibit No. 5, paragraph 2.

217/ Stamiris Exhibit No. 3, Attachment No. 2.

218/ Stamiris Exhibit No. 3, Attachment No. 7.

219/ Stamiris Exhibit No. 3, Attachment Nos. 2 and 7.

220/ See Stamiris Exhibit No. 5, Attachment Nos. 2 and 7.

221/ Keppler, Tr. 1869-70.

222/ Board Exhibit No. 1(a); Keppler, Tr. 2031-35.

223/ Board Exhibit No. 1(a), at 13.

"are not indicative of a broad breakdown in the overall quality assurance program. Admittedly deficiencies have occurred which should have been identified earlier...but the licensee's program have been effective in the ultimate identification and subsequent correction of [them]."224/

75. The NRC Staff conducted three inspections pertinent to the soils matters subsequent to issuance of the Modification Order. Quality assurance deficiencies were identified in each of these, but the nature of the deficiencies was not significant enough to impact on the total program and its implementation.^{225/}

76. In December 1980, an inspection team of Messrs. Gallagher, Gilray and Dr. Landsman reviewed Consumers Power's implementation of the corrective action commitments made in Consumers Power's responses to NRC 10 CFR §50.54(f) Questions 1 and 23.^{226/} The inspection identified two non-compliances consisting of four items. None of them was found to be substantial in nature.^{227/} The most notable related to a procedural irregularity in the FSAR re-review effort. It was determined, however, that the re-review

^{224/} Id.

^{225/} Gilray, Tr. 3787-88; Gallagher, Tr. 2362-63, 2419-29; Keppler, prepared testimony at pp. 7-8, following Tr. 1864; Keppler, Tr. 1884-85; Williams, Tr. 2227.

^{226/} Gallagher, NRC Staff prepared testimony in response to Stamiris Contention No. 3, Attachment No. 3, following Tr. 1754.

^{227/} Gilray, Tr. 3743.

itself was sound.^{228/} An inspection in October 1981 verified that all these items were properly corrected.^{229/}

77. A January 1981 NRC inspection also found only minimal quality assurance concerns. The two items specifically related to soils were promptly resolved. Mr. Gallagher stated that the soils procedures questioned in the report were adequate at the time of his testimony.^{230/} The deviation was satisfied when the geotechnical engineer whose qualifications the NRC questioned was replaced.^{231/}

78. In May 1981 the NRC conducted a special in-depth inspection to determine the effectiveness of the MPQAD.^{232/} Nine experienced NRC inspectors were sent to investigate the implementation of the quality assurance program in a variety of areas.^{233/} Fifty to sixty man days were devoted to this effort.^{234/} The NRC inspectors were familiar with other plants and construction sites^{235/} and were encouraged to be vigorous in their evaluations.^{236/} While isolated deficiencies

^{228/} Gallagher, Tr. 2359-64; Landsman Tr., 4851; Gilray, Tr. 3745.

^{229/} Landsman, Tr. 4851; NRC Staff Exhibit No. 1, at p. 4.

^{230/} Gallagher, Tr. 2438-39, 2589-09.

^{231/} Keeley, Tr. 1396-1400.

^{232/} Keppler, prepared testimony at pp. 5-8, following Tr. 1864; See NRC Staff Exhibit No. 1.

^{233/} Keppler, Tr. 1884.

^{234/} Id.

^{235/} Id.

^{236/} Keppler, Tr. 2078.

were cited, they were not serious or broad enough to challenge the NRC assessment of the adequacy of the MPQAD's quality assurance implementation.^{237/}

79. In light of the experience of his inspection team, Director Keppler expected the investigation to find considerably more problems than were found.^{238/} The inspection results reinforced the conclusion that quality assurance implementation was adequate and that Consumers Power was in control of the Project.^{239/} None of the particular deficiencies identified by the investigation related specifically to the soils area, the concern of the present hearing. It should be noted that two of the deficiencies -- qualifications of quality assurance/quality control personnel and small bore piping -- were characterized as industry-wide concerns not specific to Midland.^{240/} In the latter instance an "Immediate Action Letter" was issued.^{241/} Consumers Power has met the commitments of this letter.^{242/} In the case of another item, trending analysis, Consumers Power had already identified areas of the program requiring improvement and were in the process of implementing the improvements at the time of the inspections.^{243/}

^{237/} Keppler, Tr. 1884-85.

^{238/} Id.

^{239/} Id.

^{240/} Williams, Tr. 2212; Keppler, Tr. 2007.

^{241/} William , Tr. 2235-36.

^{242/} Williams, Tr. 3027-28.

^{243/} Turnbull, Tr. 2773-74.

80. In addition to Consumers Power's commitments, the NRC has itself made several commitments to assure the quality assurance performance at Midland. Director Keppler asserted that if at any time the adequacy of proposed resolutions are in question, he will not hesitate to stop the work involved.^{244/} He stated that, if the situation required it, he would recommend against licensing the Midland Plant, regardless of the financial implications.^{245/} Mr. Williams, head of Region III civil engineering division, stated that a full-time inspector will be assigned to the remedial measures alone.^{246/}

(13) Licensing Board Findings As To Reasonable Assurance

81. The evidence establishes that Consumers Power is presently implementing its Quality Assurance program in compliance with NRC regulations. Further, we find there is reasonable assurance that the future soils construction activities including the remedial actions taken as a result of inadequate soils placement will be accomplished in accordance with quality assurance principals of public health and safety.

82. The 1980 corporate reorganization of the Midland Project Office strengthened the Consumers Power's control over all aspects of the Project. Also significant is the

^{244/} Keppler, Tr. 2147.

^{245/} Keppler, Tr. 2146, 1895-99.

^{246/} Williams, Tr 2209-10; See also Gallagher Tr. 2589-90.

participation of John Selby, Consumers Power's Chief Executive Officer in the Project. His leadership in the Philip Crosby and Associates quality improvement program presently being implemented and his bi-weekly plant site visits assures us of his continuing support. In this regard we find there is no necessity for us to order the specific participation of Mr. Selby in resolution of the soils settlement issues, by way of reporting personally to the NRC Staff or otherwise. Mr. Selby is currently deeply involved in the ongoing activities of the Midland Project, including enhanced quality awareness and resolution of the soils settlement issues. The project reorganization presently provides for the direct accountability for the Project in a single corporate officer, James Cook. His appointment was cited by several NRC witnesses as a basis for their confidence in the Project. His testimony before this Board convinced us of his ability to assure that the Midland quality assurance program will be implemented in accordance with all regulatory requirements.

83. The integration of Consumers Power and Bechtel quality assurance departments to a single entity, the MPQAD, under Mr. Bird's direction also contributes to our finding that the quality assurance program will be adequately implemented. MPQAD has introduced significant improvements into the quality assurance implementation at the Project. In particular, we find that the corrective actions implemented to correct the specific soils deficiencies adequately address all concerns raised by the numerous Consumers Power

and NRC investigations. We have confidence that it now effectively operates to identify root causes of deficiencies and their generic implications. Our confidence is further enhanced by the independent assessments of Midland's quality assurance implementation by both the outside consulting firm, MAC, and the NRC. The MAC audit concludes that the MPQAD's performance was above average. The absence of the finding of significant deficiencies in the recent NRC inspections confirms this assessment.

84. Based on the foregoing evidence, we approve Paragraph 3 of the stipulation. We find that the current Midland quality assurance program satisfies all requisite NRC criteria, including the requirements set forth in 10 CFR Part 40, Appendix B. Further, as a result of revisions in the quality assurance program and its present implementation, there is reasonable assurance that the quality assurance and quality control programs will be appropriately implemented with respect to future soils construction activities, including remedial actions taken as a result of inadequate soil placement.

B. Contested Contentions

1. Contention No. 1

85. Ms. Barbara Stamiris, an intervenor, submitted three Contentions alleging attitudes by Consumers Power management which she characterized as inconsistent with the public health and safety. She supplemented these contentions with incidents she claims are examples of this inappropriate management attitude in her Answers to Interrogatories submitted April 20, 1981. The first of the Contentions relates to Consumers Power's management attitude in providing information to the NRC Staff concerning the soils settlement problems. It concludes that the examples provided indicate a need for "stricter than usual regulatory supervision to assure appropriate implementation of the remedial steps...." This contention and aspects of Contentions 2 and 3 as well concern Consumers Power's management attitude as it affects quality assurance. Witnesses from both Consumers Power and the NRC Staff testified about the incidents alleged in the Contention. The evidence covers the entire three year history of the discovery of the settlement problems at the Project and the arduous efforts by both the company and the Staff to resolve them. We have not confined our review, however, solely to the history of the settlement problems and specific examples listed by Ms. Stamiris. The scope of our inquiry also includes our personal observations of the witnesses and evaluations of their answers to questions at the hearing, in an effort to determine whether Consumers Power's management attitude is

consistent with continued construction of the Midland Project in accordance with NRC regulatory requirements.

1. Contention No. 1(a)

Consumers Power Company statements and responses to NRC regarding soil settlement issues reflect a less than complete and candid dedication to providing information relevant to health and safety standards with respect to resolving the soil settlement problems, as seen in:

- (a) The material false statement in the FSAR (Order of Modification, Appendix B).

86. Appendix B of the Modification Order describes an "apparent item of noncompliance" relating to an inconsistency in the Final Safety Analysis Report (FSAR) submitted by Consumers Power. The FSAR stated that fill and backfill for support beneath structures, including the diesel generator building would be "clay or controlled cohesive fill compacted, at a minimum, to 95% of ASTM D 1556-67 T."^{247/} However, the NRC asserts that these criteria were not actually followed.^{248/} This, they allege, constitutes a material false statement in the FSAR.

87. A material false statement is a term of art with legal connotations derived from language in NRC orders and opinions.^{249/} Here it would have to mean that the FSAR inconsistency influenced the Staff's analysis and approval of

^{247/} FSAR Table 2.5-9 and Table 2.5-14.

^{248/} Hood, NRC Staff prepared testimony in response to Stamiris Contention No. 1 at pp. 5-6, following Tr. 1560.

^{249/} Howell, prepared testimony at pp. 16-18, following Tr. 2802; Hood, Tr. 2668; Virginia Electric Power Co. (North Anna Power Station, Units 1 and 2) LBP-75-54, 2 NRC 498 (1975), affirmed in part, modified in part, revised in part ALAB-324, 3 NRC 347 (1976).

the FSAR.^{250/} However, as such, it reflects neither Consumers Power's deliberate falsification of information nor Consumers Power's intentional withholding of information.^{251/}

88. According to Darl S. Hood, the NRC Senior Project Manager for Midland, inconsistencies in the FSAR of nuclear power plants during construction are not uncommon.^{252/} He described the particular FSAR inconsistency in question as unintentional. Mr. Hood rejected the statement in the Contention that the inconsistency reflected a less than complete and candid dedication to providing information with respect to resolving soil settlement problems.^{253/} The FSAR is a document of 20 volumes, each 3 to 3-1/2 inches thick. In the 10 years of developing its information, over 30 revisions have been made. In such a context, Mr. Howell of Consumers Power characterized the inconsistency as inadvertent.^{254/}

89. Subsequent to the identification of the soils settlement problem, but before the issuance of the Modification Order, inconsistencies in the FSAR were identified. The one cited as a material false statement and the subject

^{250/} Id.; Hood, NRC Staff, prepared testimony in response to Stamiris Contention No. 1 at pp. 5-7, following Tr. 1560.

^{251/} Id.; Hood, Tr. 2729-30.

^{252/} Hood, Tr. 2667.

^{253/} Hood, NRC Staff prepared testimony in response to Stamiris Contention No. 1 at pp. 5-7, following Tr. 1560.

^{254/} Howell, prepared testimony at pp. 16-18, following Tr. 2802.

of this Contention was among them. As a result of the identification of the error in April 1979, Consumers Power management ordered an extensive re-review of the FSAR for inconsistencies and errors in all its facets.^{255/} The project involved 340 people, and took 12 months to complete, at a significant cost of manpower and dollars.^{256/} Consumers Power performed three audits to verify the results of the re-review program.^{257/} The audits confirmed the success of the effort.^{258/} Dr. Ross Landsman, an NRC Region III Inspector, investigated the re-review effort and the audits.^{259/} He concluded that the re-review was successful.^{260/} In addition to the re-review, procedures were implemented to prevent the recurrence of such inconsistencies.^{261/}

90. We concur with Consumers Power's and the Staff's position concerning this contention example. We find that the FSAR inconsistency identified in Appendix B of the Modification Order does not reflect adversely on Consumers Power's management's attitude and dedication to providing relevant health and safety information with respect to soils

^{255/} Marguglio, prepared testimony, Attachment No. 10 at p. 23-36, following Tr. 1501.

^{256/} Howell, prepared testimony at pp. 15-18, following Tr. 2802.

^{257/} Bird, Tr. 3147-48.

^{258/} Bird, Tr. 3148.

^{259/} Landsman, Tr. 4848-51.

^{260/} Id.

^{261/} Gallagher, Tr. 1824.

settlement issues. We note that once the inconsistency was identified Consumers Power promptly implemented actions to correct the specific item and to prevent and correct any similar problems. The extensive FSAR re-review program to identify and correct FSAR inconsistencies started before the Modification Order issued. It demonstrates dedication on the part of Consumers Power management to assure that relevant health and safety information is correct and complete.

(2) Contention No. 1(b)

Consumers Power Company statements and responses to NRC regarding soil settlement issues reflect a less than complete and candid dedication to providing information relevant to health and safety standards with respect to resolving the soil settlement problems, as seen in

(b) the failure to provide information resolving geological classification of the site which is pertinent to the seismic design input on soil settlement issues (Responses to FSAR Questions 361.4, 361.5, 361.7 and 362.9).

91. Consumers Power took an initial position in the FSAR that the plant site should be geologically classified in a tectonic province called the Michigan Basin. This classification would define a controlling earthquake to be used in the Operating License Stage seismic review of the plant. The NRC Staff initially determined that another tectonic province -- the Central Stable Region -- was proper.^{261A/}

^{261A/} See Howell, prepared testimony, Attachment Nos, 3, 4, 5 and 6 at pp. 18-19, following Tr. 2802. The Staff and Consumers Power have resolved this issue. They are now in agreement that the Central Stable Region can be subdivided into smaller tectonic provinces. On the basis of expert consultant opinion, however, Consumers Power persists in its characterization of the province as the Michigan Basin. See Holt, prepared testimony, following Tr. 4539; Kimball, NRC Staff prepared testimony, following Tr. 4690.

92. To explore the basis for Consumers Power position, the NRC Staff submitted several questions (FSAR Questions 361.4, 361.5 and 361.7) to Consumers Power concerning the Michigan Basin.^{262/} FSAR Question 361.4 requested Consumers Power to provide an outline of those characteristics distinguishing the Michigan Basin from the Central Stable Region.^{263/} FSAR Question 361.5, among other things, requested an analysis of certain seismic disturbances and a comparison of the seismicity of the region within 200 miles of the site with other areas in the Central Stable Region.^{264/} In FSAR Question 361.7, the Staff requested that the comparative quantitative analysis of the seismicity within 200 miles of the site to other Central Stable Areas be actually computed.^{265/} Consumers Power responded to each of these questions.^{266/}

93. Stephen Howell described the exchange of information in FSAR Questions 361.4, 361.5 and 361.7 and Consumers

^{262/} Kimball, NRC Staff prepared testimony in response to Stamiris Contention No. 1 at pp. 6-7, following Tr. 1560.

^{263/} Id.

^{264/} Kimball, NRC Staff prepared testimony in response to Stamiris Contention No. 1, Attachment No. 4, following Tr. 1560. This answer was updated in October 1980; Kimball, NRC Staff prepared testimony in response to Stamiris Contention No. 1, Attachment No. 5, following Tr. 1560.

^{265/} Kimball, NRC Staff prepared testimony in response to Stamiris Contention No. 1 at pp. 6-7, Attachment No. 6, following Tr. 1560; Howell, Tr. 2939-40.

^{266/} Id.

Power responses to them as an "honest difference of opinion among experts."^{267/} Consumers Power disclosed to the Staff all the information which was requested of it. The fact that the seismic question remained unresolved derived not from lack of information but from a disagreement as to what that information meant.

94. Jeffrey K. Kimball, a seismologist/geophysicist on the NRC Staff, emphasized that Consumers Power "did not fail to provide information in responding to Questions 361.4, 361.5 and 361.7 as alleged" in the contention.^{268/} Rather, he recognized that this exchange of information was due to a difference of opinion between the Staff and Consumers Power experts as to the proper site seismic classification.^{269/} As such, the Staff did not view these as examples of a "less than complete and candid dedication" to providing information relevant to the soils settlement matter.^{270/}

94. We find that Consumers Power's responses to Questions 361.4, 361.5 and 361.7 do not reflect a management attitude of less than complete and candid dedication to

^{267/} Howell, prepared testimony at p. 18, following Tr. 2802.

^{268/} Kimball, NRC Staff prepared testimony in response to Stamiris Contention No. 1 at pp. 6-7, following Tr. 1560. Jeffrey Kimball's credentials are attached to NRC Staff prepared testimony, Attachment No. 1, following Tr. 1560.

^{269/} Id.

^{270/} Id.

providing information.^{271/} Rather, the responses indicate a difference of opinion among experts. These disputes are not uncommon. Consumers Power is not required to accept, without question, every position the Staff asserts. The technical questions to which the Staff requested Consumers Power respond and the company's responses are examples of the process by which such issues are resolved.

(3) Contention No. 1, Interrogatory "Example" No. 1

Consumers Power Company statements and responses to NRC regarding soil settlement issues reflect a less than complete and candid dedication to providing information relevant to health and safety standards with respect to resolving the soil settlement problems, as seen in:

Examples of CPCo reluctance to provide requested information

1. 3/31/80 NRC meeting notation of Applicant's reluctance to provide NRC consultants with requested information.

95. On March 31, 1980, the NRC Staff distributed its summary of a meeting held on February 27-28, 1980 between the NRC Staff, NRC consultants, Consumers Power, Consumers Power consultants, and Bechtel.^{272/} In reference to some

^{271/} The contention also includes Question 362.9 as a seismic design Question. Intervenor Stamiris does not provide any evidence as to why this question should be classified as a "seismic" inquiry. See, Kimball, NRC Staff prepared testimony in response to Stamiris Contention No. 1, Attachment No. 7, following Tr. 1560. It is our understanding that it pertains to structural settlement measurements from benchmarks. This has no relationship to seismic classification and we have not addressed it in our findings.

^{272/} NRC Staff prepared testimony in response to Stamiris Contention No. 1, Attachment No. 9, following Tr. 1560.

information regarding the remedial work, the Staff noted that although it had access to documents containing the information through audit mechanisms, the documents could be made available through the application process.^{273/} The summary stated:

The staff noted that such documents as above are needed by its consultants for their independent assessment of the adequacy of the proposed remedial measures and requested that these be made publicly available. The applicant indicated a reluctance to this end, and noted that these were available through the I&E audit mechanism. The staff will issue^{274/} a formal request for these documents.

In light of Intervenor Stamiris' failure to present affirmative evidence regarding this Contention example, we assume that her example refers to this statement.

96. Daryl Hood from the NRC Staff described the discussion which gave rise to this comment. At the meeting it was noted that much of the documentation the Staff requested was not normally placed in the the license application material sent to Washington.^{275/} The voluminous nature of the Staff request increased the expense and burden entailed in including the documents in the application.^{276/} Consumers Power requested that the audit mechanism be used, which

^{273/} Id.

^{274/} Id.

^{275/} Hood, NRC Staff prepared testimony in response to Stamiris Contention No. 1 at p. 8, following Tr. 1560.

^{276/} Id.

would permit the NRC to examine the documents at a local record center such as Bechtel's offices in Ann Arbor, Michigan.^{277/}

97. On April 1, 1980, the NRC Staff formally requested several of these documents through the application process, on behalf of its consultants, the U. S. Army Corps of Engineers, the U.S. Naval Surface Weapons Center and the Energy Technology Engineering Center.^{278/} Part of this included a request for 40 copies each of "all reports... meeting summaries and other written communications, with or by consultants" involving soils and remedial measure tests and investigations. A several page list of 20 examples of the sorts of information desired was included.^{279/} The list contained a request for a Bechtel report on "Qualification of Compaction Equipment."^{280/}

98. Consumers Power responded on May 5, 1980, forwarding all but five of the items requested.^{281/} Consumers Power's efforts in relation to four of these items are not questioned.^{282/} The fifth item was the Bechtel report

^{277/} Id.

^{278/} NRC Staff prepared testimony in response to Stamiris Contention No. 1, Attachment No. 10, following Tr. 1560.

^{279/} Id., Attachment No. 10, Enclosure No. 1.

^{280/} Id.

^{281/} Gallagher, Tr. 2603; NRC Staff prepared testimony in response to Stamiris Contention No. 1 at pp. 8-10, following Tr. 1560.

^{282/} Hood, Tr. 2675, 2734; Gallagher, Tr. 2603.

concerning compaction equipment qualification tests. This document was formally submitted to the NRC on August 15, 1980.^{283/}

99. The information requested in February 1980 was similar to a request initially made by the NRC resident inspector in December, 1978. He had asked for a list of the equipment, "with a discussion of the compacting capability and limitations of each, which had been used for compacting the fill of the DGB from elevation 618 to 628."^{284/} However, such a report did not exist.^{285/} At that time all actual soils activity at the work site had ceased.^{286/} In order to develop the document, compaction equipment would have to be mobilized and soils fillings and testing operations instituted.^{287/} When the NRC was informed that the original compaction equipment qualification list did not exist, they changed their request in mid-1979 to include any equipment which was to be subsequently used in any future soils work.^{288/} In July, 1979, Consumers Power committed to the NRC Staff not to do any soils work until the compaction

^{283/} NRC Staff prepared testimony in response to Stamiris Contention No. 1, at pp. 8-10, following Tr. 1560.

^{284/} Id., Attachment No. 11, p. 4.

^{285/} Gallagher, Tr. 2549, 2550.

^{286/} Gallagher, Tr. 2552.

^{287/} Gallagher, Tr. 2552.

^{288/} Gallagher, Tr. 2577.

equipment was qualified.289/ Consumers Power has kept this commitment.290/

100. As of April, 1980, Eugene Gallagher was in contact with Don Horn, the Consumers Power site civil quality assurance supervisor, concerning the report.291/ Mr. Horn was trying very hard to obtain the report for Mr. Gallagher.292/ Mr. Gallagher never asked anyone besides Mr. Horn to expedite his request for the equipment qualification list.293/ Although Mr. Gallagher concluded that the March meeting notes cited in the contention did not reflect an overall deficiency in "managerial attitude" in providing information, he felt that the delay in supplying the compaction equipment information did reflect adversely "on the responsible officials involved in execution of CPCo's quality assurance program."294/

101. We have examined the sequence of events resulting from the March 1980 meeting notes. It leads us to reject example 1 of Contention 1 as evidence of a poor management attitude on the part of Consumers Power. No evidence was proffered by anyone demonstrating any reluctance on the part of Consumers Power management to give NRC consultants information. On

289/ Gallagher, Tr. 2604.

290/ Id.

291/ Gallagher, Tr. 2598-99.

292/ Id.

293/ Gallagher, Tr. 2604-06.

294/ Gallagher, NRC Staff prepared testimony in response to Stamiris Contention No. 1 at p. 10, following Tr. 1560.

the contrary, NRC Staff testimony indicates the "reluctance" quoted in the summary text merely reflected a discussion between the NRC and Consumers Power concerning the method of supplying the information. It did not involve any reluctance on the part of Consumers Power to give information in the first place.

102. When the NRC made its formal request for documents in April 1980, Consumers Power's response was prompt, especially in light of the volume of documents requested. We do not accept the episode involving the NRC Staff's request for a compaction equipment qualification report as reflecting adversely on Consumer Power's quality assurance or management personnel. First, Mr. Gallagher could not identify any Consumers Power quality assurance or management personnel who either hampered his request, ignored his request or demonstrated any reluctance to provide the information or any inattention to the Staff's request. On the contrary, Mr. Gallagher stated that Mr. Horn, the only Consumers Power employee he contacted, was trying his hardest to obtain the report. Second, while there might have been a delay in supplying the report to the NRC, the evidence does not indicate Consumers Power's quality assurance department was involved in the delay or in any way exacerbated it.

(4) Contention No. 1 Interrogatory "Example" 2

Consumers Power Company statements and responses to NRC regarding soil settlement issues reflect a less than complete and candid dedication to providing information relevant to health and safety standards with respect to resolving the soil settlement problems, as seen in:

Examples of CPCo. reluctance to provide requested information

2. Vol. III, tab 65 50-54f, 8/6/79 meeting, attitude that "needlessly conservative decisions may be formulated on the 'what if' type questions" by the NRC on dewatering.

108. This example pertains to a phrase which appears in summary notes of a meeting held on June 27, 1979. Three Bechtel employees, three Bechtel consultants and Tom Cook from Consumers Power attended the meeting.^{294A/} The last paragraph in its entire context, notes;

"A brief discussion then followed concerning possible liquefaction regarding utilities, sand backfill around buildings, tank farm, railroad bay and control tower, etc. For the tank farm, railroad bay and control tower a safety factor of 1.5 is generally acceptable. However, if for any reason the acceleration criteria goes up in the future, Dr. Peck [a consultant] felt that it may be difficult to prove no liquefaction problems. The borings may not be completely satisfactory for the purpose of proving beyond a shadow of a doubt that everything was satisfactory because needlessly conservative decisions may be formulated on the "what if" type of questions. The consultants noted that they were still in favor of a general dewatering program, especially in light of possibly more stringent seismic requirements in the future..."^{295/}

104. Ms. Stamiris did not present any evidence on this example. Darl S. Hood testified that, although he was not present at the meeting, it was his understanding the phrase reflected the intent of the consultants and not of Consumers

^{294A/} NRC Staff prepared testimony in response to Stamiris Contention No. 1 at pp. 10-11, Attachment No. 13, following Tr. 1560.

^{295/} Id.

Power.^{296/} If so, the view of Bechtel consultants could not be a reflection on Consumers Power's dedication to providing information or its management attitude.^{297/} In fact, in Mr. Hood's opinion, the phrase did not even pertain to providing information to the NRC.^{298/}

105. Dr. Ralph Peck, a consultant to Bechtel concerning the soils settlement problem, did attend the June 27, 1979 meeting.^{299/} He could not recall making the particular statement concerning the "what if" type questions.^{300/} According to him, the phrase applies not to dewatering, as the example suggests, but to the question of liquefaction.^{301/} He stated that it was probably somebody's characterization of a general discussion which took place at the meeting.^{302/} It was his belief that the "what if" phrase related to the ambiguities of soil boring results.^{303/}

106. We cannot find that this particular example relates at all to Consumers Power's management attitude and dedica-

^{296/} Hood, NRC Staff prepared testimony in response to Stamiris Contention No. 1 at pp. 10-11, following Tr. 1560.

^{297/} Id.

^{298/} Id.

^{299/} NRC Staff prepared testimony in response to Stamiris Contention No. 1, Attachment No. 13.

^{300/} Peck, Tr. 3420-21.

^{301/} Peck, Tr. 3421.

^{302/} Peck, Tr. 3419-20, 3468.

^{303/} Peck, Tr. 3421-22.

tion to responding to NRC information requests. First, in the context of the paragraph, it is clear that the statement does not even pertain to the views of Consumers Power management. Second, the premises underlying the example are incorrect. Dr. Peck, and a plain reading of the context in which this statement was made, indicate that the statement concerns liquefaction, not dewatering as the contention suggests. Moreover, the example states that the "what if" type questions would be made "by the NRC." Neither the text of the entire paragraph nor any testimony relates the phrase to the NRC. Based on the above analysis, we cannot conclude that example two of contention 1 in any way reflects a less than a complete and candid dedication on the part of Consumers Power to providing to the NRC safety information concerning soils settlement problems.

(5) Contention No. 1, Interrogatory "Example" No. 3

Consumers Power Company statements and responses to NRC regarding soil settlement issues reflect a less than complete and candid dedication to providing information relevant to health and safety standards with respect to resolving the soil settlement problems, as seen in:

Examples of CPCo. reluctance to provide requested information.

3. The 11/24/80 S.A.L.P. assessment on CPCo - NRR interface as presented by D. Hood in the following statements regarding soil settlement issues:

"A big contributor to the inability to make meaningful progress in this matter is the quality of responses gotten. We have set some kind of record on the number of questions re-asked, which speaks poorly for CPCo-NRR interface....The bottomline is there seems to be a lack

of appreciation or support of Staff review necessities and a tendency to push ahead despite the lack of proper assurance."

107. On November 24, 1980, the NRC conducted a meeting of the "Systematic Assessment of Licensee Performance" (SALP) Board for Consumers Power Midland Plant.^{304/} Its purpose was to inform Consumers Power of its overall evaluation of Midland.^{305/} Darl Hood, a participant in the meeting, made the statement quoted in the contention.^{306/} In his prepared testimony, Mr. Hood cited two examples of the "bottomline" phrase in the quote: (1) Consumers Power placement and removal of diesel generator building surcharge "without first providing an adequate response to 50.54(f) Request 4," and (2) Consumers Power construction of the Borated Water Storage Tanks without first performing the analysis for variable foundation properties and cracks as discussed in the response to 50.54(f) Request 14.^{307/}

Re-Asked Questions

108. Darl Hood testified that the part of his comments regarding "re-asked" questions and the poor Consumers Power - NRR interface was not intended to indicate that "lack of progress" was solely the fault of Consumers Power.^{308/} Mr.

^{304/} Hood, NRC Staff prepared testimony in response to Stamiris Contention No. 1 at pp. 11-13, following Tr. 1560.

^{305/} Id.

^{306/} Id.

^{307/} Id.

^{308/} Hood, Tr. 2700.

Hood stated that early in the reviewing process for the Midland remedial measures, in October, 1979, the Three Mile Island accident occurred. This accident affected scheduling of the NRC's Midland review.309/ Other problems within the NRC also contributed to the insufficiency of their review.310/ For example, during January 1980, the Army Corps of Engineers were hired as consultants to the Staff. It took the Army Corps of Engineers time to familiarize themselves with soils settlement problems.311/ By the time the Army Corps of Engineers had become familiar with the Midland settlement, more than eighteen months had passed since the excess settlement was first reported to the NRC Staff.312/ This was reflected in "insufficient progress" in the NRC technical review of Midland.313/ The NRC Staff technical review was also delayed by the replacement of NRC geotechnical expert in late 1979.314/ Finally, Mr. Hood suggested that the portion of his statement referring to the number of questions asked and re-asked was drawn from the early stages of the operating licensing review and was not limited to the soils settlement issue.315/

309/ Hood, Tr. 2747-48.

310/ Hood, Tr. 2703-04.

311/ Hood, Tr. 2706.

312/ Id.

313/ Hood, Tr. 2704-05.

314/ Hood, Tr. 2709.

315/ Hood, Tr. 2707-08.

Diesel Generator Building Preload Example

109. The first example of the "bottomline" phrase in the quote Mr. Hood gave relates to the placement and removal of the preload from the diesel generator building. He stated that this was done without Consumers Power providing an adequate response to NRC 10 CFR §50.54(f) Request No. 4 (Question 4). A brief history of Staff and Consumers Power exchange of information concerning this is necessary. In early December 1978, individuals from the Geosciences branch of the NRR of the NRC met with Consumers Power, Bechtel and Bechtel consultants concerning the diesel generator building preload. At that meeting, Consumers Power and its consultant, Dr. Peck, presented extensive evidence concerning he proposed diesel generator preload.^{316/} The NRC was given a prediction by Dr. Peck, based on his experience with the preload procedure, of the probable settlement of the building during and after the preload.^{317/} The NRC was told that Consumers Power intended to begin preloading the structure soon.^{318/} At that time, no one from the Staff or Staff representative told Consumers Power not to proceed with its surcharge.^{319/} Further, no one from

^{316/} Hood, NRC Staff prepared testimony in response to Stamiris contention No. 1, Attachment No. 11, following Tr. 1560.

^{317/} Hood, Tr. 2685.

^{318/} Hood, Tr. 2664, 4169.

^{319/} Hood, Tr. 2678.

the Staff or a representative from the Staff suggested to Consumers Power that its review would be more difficult because of the preload program.^{320/} Indeed, the Staff never even requested that Consumers Power delay starting the preload until after it could formulate further questions.^{321/} At the conclusion of that meeting, the NRC informed Consumers Power that the proposed preload would be done at Consumers Power's own financial risk.^{322/} These risks are not peculiar to Consumers Power but are inherent in any action taken by any licensee with respect to changes in the construction of a nuclear facility.^{323/}

110. The preload remedial solution can be characterized as an "observational method" of procedure.^{324/} In this method, information concerning the success of the procedure is developed from the very behavior of doing the procedure, i.e., information acquired throughout the procedure yields data for its verification.^{325/} It is sometimes called a proof test.^{326/} In a proof test procedure, such as the

^{320/} Id.

^{321/} Id.

^{322/} NRC Staff prepared testimony in response to Attachment No. 11 at p. 7, following Tr. 1561.

^{323/} Hood, Tr. 2679; Hood NRC Staff prepared testimony in response to Stamiris Contention No. 1, Attachment No. 11, following Tr. 1560.

^{324/} Hood, Tr. 2679.

^{325/} Id.

^{326/} Hood, Tr. 2680.

preload, one is able to tell whether the remedial action was successful only by observation after the preload has been removed.^{327/}

111. The Staff generally sees its reviewing role in terms of a two-part process. First, the Staff determines from supplied predictive criteria before a procedure is begun whether the procedure will reasonably achieve the end product, and whether the method of doing it will endanger the health and safety of the public.^{328/} Second, after the procedure is finished, it checks the results. Mr. Hood agreed that the dispute between the Staff and Consumers Power with regard to the preload was essentially one of technical differences concerning the efficacy of the program. The Staff wanted more predictive information so it could satisfy what it defined as the first part of its review process. The nature of the preload proof test itself prevented the development of that information before the preload began.

112. Consumers Power began placing its preload on the diesel generator building in January of 1979.^{329/} The NRC did not issue requests for information about the surcharge in the form of "Request 4" (10 CFR §50.54(f) Question 4) until March, 1979.^{330/} Mr. Hood claimed that Consumers

^{327/} Id.

^{328/} Hood, Tr. 2600.

^{329/} Hood, Tr. 2676.

^{330/} Id.

Power's timeliness in supplying information was part of the technical dispute.^{331/} He admitted, however, that Consumers Power had no choice but to place the preload without having responded to the NRC's request for information since Consumers Power had not even received "Request 4" until after the preload had begun.^{332/}

113. On July 16, 1979, another meeting took place between the NRC Staff and representatives of Consumers Power, Bechtel and the consultants.^{333/} Several NRC officials including Mr. James Knight, Assistant Director of Components and Structures and Systems for the NRC, attended this meeting. At this meeting, there was a discussion about the timing of the removal of preload.^{334/} No NRC Staff representatives indicated to Consumers Power that the preload had not been in place long enough or requested deferral of the surcharge removal.^{335/} Similarly, no one from the Staff suggested they had not received an adequate response to Question 4 or that Consumers Power refrain from further remedial work on the diesel generator building until they did.^{336/} Mr. Knight told Consumers Power that the informa-

^{331/} Hood, Tr. 2712.

^{332/} Hood, Tr. 2676-77.

^{333/} Hood, Tr. 2686.

^{334/} Hood, Tr. 2687.

^{335/} Hood, Tr. 2687-88.

^{336/} Hood, Tr. 2688.

tion the NRC had received at this meeting was significant and requested it be documented.337/ Consumers Power responded by letter within 30 days of the meeting on August 10, 1979.338/ On August 15, 1979, removal of the preload began.339/ Removal was completed at the end of August.340/

114. On August 24, 1979, there was an internal NRC meeting to discuss the Midland project.341/ According to Mr. Hood's meeting notes, Mr. Knight reported that the technical solutions proposed by Consumers Power for the major structures, including the diesel generator building, were basically sound if properly implemented.342/ Mr. Hood could not recall any discussion as to whether Consumers Power had removed the diesel generator building surcharge without first providing the NRC with an adequate response to Request 4.343/

Borated Water Storage Tank Example

115. The second example Mr. Hood mentioned pertains to the construction of the borated water storage tanks without, according to Mr. Hood, performing analysis for variable

337/ Hood, Tr. 2689.

338/ Id.

339/ Hood, Tr. 2690.

340/ Id.

341/ Id.

342/ Id.; See also Consumers Power Exhibit No. 9, Memorandum of August 24, 1979 meeting.

343/ Hood, Tr. 2696.

foundation properties and cracks as discussed in Response to Request 14 (10 CFR §50.54(f) Question 14).^{344/} By March 1979, the foundation ring of the borated water storage tank had already been constructed; the steel portion of the borated water storage tank, which rests on the foundation ring, had not.^{345/} Mr. Hood limited his statement in his prepared testimony to the steel tank itself.^{346/} In March, 1979, the NRC submitted Question 14, asking, among other things, that an evaluation be made of the effects of the the existing and/or anticipated cracks in any of the category 1 (safety-related) structures on the performance of such structures.^{347/} This included the borated water storage tanks.

116. In the summer of 1979, Consumers Power conducted an investigation of the cracks as they existed in the borated water storage tank foundation ring and concluded that the cracks were localized and not significant; their widths did not exceed two-hundredths of an inch.^{348/} A crack map of this investigation was provided to the NRC.^{349/} In addition to this investigation, Consumers Power evaluated the fill

^{344/} Hood, NRC Staff prepared testimony in response to Stamiris Contention No. 1 at pp. 11-13, following Tr. 1560.

^{345/} Hood, Tr. 2713.

^{346/} Id.

^{347/} Hood, Tr. 2713-16.

^{348/} Hood, Tr. 2715.

^{349/} Hood, Tr. 2716.

material under the borated water storage tank foundation and found it satisfactory.^{350/} The results of the investigation were also provided to the NRC prior to September, 1979.^{351/} Consumers Power informed the Staff that construction of the borated water storage tanks would begin in September, 1979.^{352/} Upon completion Consumers Power planned to conduct a preload test by filling the tanks with water and monitoring settlement.^{353/} The Staff began its review of the crack and soils investigations before the construction of the borated water storage tanks.^{354/} Mr. Hood stated that at this time the Staff wanted a "finite element analysis" of the cracks to provide assurance for the ring structure.^{355/} However, Mr. Hood admitted that Question 14 did not request a finite element analysis.^{356/} Rather, Question 14 asked Consumers Power to provide an evaluation of the abilities of category I structures to withstand increased differential settlement and an evaluation showing in which structures Consumers Power expected settlement in excess of that originally intended.^{357/} In September, 1979, when the construction of

^{350/} Hood, Tr. 2716-17.

^{351/} Hood, Tr. 2717-18.

^{352/} Hood, Tr. 2717-18.

^{353/} Hood, Tr. 2713.

^{354/} Hood, Tr. 21717-18.

^{355/} Hood, Tr. 2721.

^{356/} Hood, Tr. 2721.

^{357/} Hood, Tr. 2723-24.

the borated water storage tank began, Consumers Power did not expect to experience settlement for the structure's foundation ring in excess of that originally anticipated.^{358/} At the time the tanks were constructed, the Staff never communicated to Consumers Power that it believed excessive settlement with respect to the borated water storage tank foundation was going to occur.^{359/} No one from the Staff communicated to Consumers Power any dissatisfaction with the investigations conducted on the structure.^{360/} No one from the Staff communicated to Consumers Power that there was a lack of reasonable or proper assurance with respect to the borated water storage tank foundation ring before construction of the tanks began.^{361/} No one from the Staff told Consumers Power that the Staff lacked an opportunity to review the information Consumers Power had given it about the borated water storage tanks.^{362/}

117. Mr. Hood testified that Consumers Power used proof tests such as the one used in the borated water storage tanks and the diesel generator building on other structures. Specifically, Mr. Hood recalled the incident where the diesel oil fuel underground structures were filled and

^{358/} Id.

^{359/} Id.

^{360/} Hood, Tr. 2719-20.

^{361/} Hood, Tr. 2725, 2727.

^{362/} Hood, Tr. 2725-26.

settlement observed for a period of six months.^{363/} No excessive settlement for these safety-related structures was observed.^{364/} The Staff accepted the results of this test as demonstrating that the fill material under the diesel oil fuel tanks was satisfactory.^{365/}

118. From the foregoing evidence, we cannot agree that the example demonstrates a reluctance on the part of Consumers Power management to provide requested information to the NRC regarding soils settlement issues. In regard to the "re-asked" questions phrase, even Mr. Hood does not place the blame solely on Consumers Power. Mr. Hood testified as to the problems the NRC experienced with regard to resource allocation because of the TMI incident and the change of consultants during the period of the NRC review. Furthermore, Mr. Hood associated this part of his statement primarily with the problems the NRC encountered with reviewing the FSAR for the operating license proceeding, rather than with soils issues as the commission does. No examples of the questions that needed to be re-asked nor any description of how Consumers Power management contributed to the problems of communication were provided. Based on this evidence, we cannot accept the "re-asked questions" phrase as demonstrating Consumers Power's reluctance to provide safety and public health information concerning soils settlement issues.

^{363/} Hood, Tr. 2759.

^{364/} Id.

^{365/} Hood, Tr. 2759-60.

119. Further, we find that Mr. Hood's concerns about the NRC requests for diesel generator building and the borated water storage information reflect only a technical disagreement between the Staff and Consumers Power. They do not demonstrate a reluctance on the part of Consumers Power to provide information. In the diesel generator building, Consumers Power chose an observational or proof test method to solve excessive settlement problems. The Staff has apparently accepted the results of such a proof test with regard to the diesel fuel oil tanks. Because the observational method was used, Consumers Power was unable to supply the kind of predictive information the Staff requested. To censure Consumers Power for a failure to provide this information is to suggest they exhibited poor management attitude in choosing the observational method over the acceptance criteria method.

119A. We cannot accept such a suggestion for several reasons. First, although the Staff was well aware that the preload would begin, there is no evidence that they communicated to Consumers Power any reservations about it. In light of this, we cannot say there was a tendency to "push ahead despite proper assurance"; in fact, there was property assurance. Second, it is illogical to suggest that Consumers Power "pushed ahead" with the diesel generator building preload without providing an adequate response to the NRC's request for information. The Staff did not request this information until after the preload was in place. Third, if the Staff position is

accepted, the observational method or proof test solution -- because it cannot supply the type of acceptance criteria the Staff would require -- could never be used in the construction of nuclear power plants. We do not read the regulations to preclude such an approach.

120. With regard to the borated water storage tanks, a similar analysis is possible. The Staff never asked Consumers Power for the information about "finite element analysis" it now asserts was lacking in Consumers Power crack and soils investigation. We find it impossible to censure Consumers Power for not providing information they never received a request for. Based on its soils investigation results Consumers Power expected the settlement of the fabricated tanks to be normal. Under these conditions, the NRC Request 14 did not demand detailed analysis. Finally, Consumers Power intended to test its investigation of the soils with a proof test similar to that used on the diesel generator building and the diesel oil storage tanks. In the latter instance the NRC found the method of settlement analysis sufficient. There was no reason to reject it in the case of the borated water storage tanks.

(b) Contention No. 1, Interrogatory "Example" No. 4

Consumers Power Company statements and responses to NRC regarding soils settlement issues reflect a less than complete and candid dedication to providing information relevant to health and safety standards with respect to resolving the soils settlement problems, as seen in:

Examples of CPCo. reluctance to provide requested information:

4. The perfunctory manner in which CPCo deponents answered questions. (I will tabulate examples from the depositions.)

121. Intervenor Stamiris never presented any tabulations of any examples demonstrating the manner in which Consumers Power deponents answered questions.

122. The NRC submitted testimony that stated that without the tabulated examples of the "perfunctory manner in which Consumers Power deponents answered questions", the Staff was unable to address or even evaluate this contention.^{366/}

123. There is no evidence that Consumers Power officials were reluctant to provide information requested of them at depositions. In light of this, we must reject Contention 1, Example 4 as evidence of a reluctance on the part of Consumers Power management to provide information to the NRC.

(7) Contention No. 1, Interrogatory Example No. 5

Consumers Power Company statement and responses to NRC regarding soils settlement issues reflect a less than complete and candid dedication to providing information relevant to health and safety standards with respect to resolving the soils settlement problems, as seen in:

Examples of information withheld or incorrectly given:

5. The failure of CPCo to discuss the Administration Building settlement problem with the NRC, as early as they did with their consultants, in the early meetings on the DGB settlement.

^{366/} Hood, NRC Staff prepared testimony in response to Stamiris Contention No. 1 at p. 13, following Tr. 1560.

124. In August 1977, Consumers Power Company discovered that a grade beam on the Administration Building exhibited excessive settlement.^{367/} The Administration Building is a non-safety related structure; as such, there was no requirement to report the problem to the NRC.^{368/} Bechtel conducted an investigation to determine the source of the settlement problem and its implications.^{369/} The investigation revealed that the original fill under the Administration Building grade beams had been subsequently re-excavated to to permit placement of concrete for a steam tunnel into the building.^{370/} It was determined that inadequate soils compaction of the re-excavated fill under one of the seven grade beams had caused it to settle.^{371/} The inadequately compacted soil under the columns supporting the failed beam was removed and replaced with lean concrete.^{372/} The investigation further considered whether the settlement problem was localized or whether it had generic, plant-wide implications.^{373/} The two grade beams adjacent to the failed beam were load tested.

^{367/} Keeley, prepared testimony at p. 4, following Tr. 1163.

^{368/} Keeley, Tr. 1315; Gallagher, Tr. 2356, 2404-11.

^{369/} Keeley, prepared testimony at p. 5, following Tr. 1163; Kane, Tr. 4300; Gallagher, Tr. 2556.

^{370/} Keeley, prepared testimony at p. 5, following Tr. 1163; Kane, Tr. 4300; Gallagher, Tr. 2534.

^{371/} Keeley, prepared testimony at p. 5, following Tr. 1163.

^{372/} Keeley, prepared testimony at p. 5, following Tr. 1163.

^{373/} Gallagher, Tr. 2561; Keeley, prepared testimony at p. 5, following Tr. 1163.

No indications of problems occurred after these tests.^{374/} Then seven borings were taken into the soil to test conditions.^{375/} Five borings were taken around the adjacent beam;^{376/} two borings were taken outside the area of the Administration Building to broaden the investigation.^{377/} One of these was taken near the Diesel Generator Building and the other near the evaporator building.^{378/} The borings indicated no soils problems. No other buildings on the site at that time indicated any unusual settlement.^{379/} Based upon the results of the investigation, the nature of the failure and the information available at the time, it was concluded that the grade beam failure of the Administration Building was a localized problem.^{380/} The NRC admitted that there was nothing to show that the investigation was skewed.^{381/} The U.S. Testing Company, the Bechtel subcontractor which had tested the

^{374/} Keeley, prepared testimony at p. 5, following Tr. 1163; Gallagher Tr. 2592.

^{375/} Gallagher, Tr. 2556; Keeley prepared testimony at p. 5, following Tr. 1163.

^{376/} Gallagher, Tr. 2556.

^{377/} Kelley, prepared testimony at p. 5, following Tr. 1163; Gallagher, Tr. 2556 and 2591-92.

^{378/} Id.

^{379/} Gallagher, Tr. 2556.

^{380/} Keeley, prepared testimony at p. 5, following Tr. 1163; Gallagher Tr. 2556.

^{381/} Gallagher, Tr. 2557.

soils under the Administration Building beam, was notified of the investigation results and its personnel received retraining to prevent recurrence of the problem.^{382/}

125. Eugene Gallagher testified he thought that Consumers Power withheld information concerning the Administration Building grade beam from the NRC. He initially claimed such information was relevant to the full understanding of the diesel generator building settlement.^{383/} In his prepared testimony he stated he first learned about the problem in January, 1979, from a Bechtel design supervisor.^{384/}

126. On cross-examination, Mr. Gallagher admitted that he was in error regarding the date on which he was first informed of the Administration Building grade beam settlement. He recalled that he in fact learned of the Administration Building settlement grade beam failure in December, 1978.^{385/} Mr. Gallagher initially spoke to the Bechtel design supervisor sometime before December 21, and on December 21, 1978 he discussed the grade beam failure with Don Horn, a Consumers Power employee.^{386/}

^{382/} Keeley, Tr. 1198.

^{383/} Gallagher, NRC Staff prepared testimony in response to Stamiris Contention No. 1 at p. 14, following Tr. 1560.

^{384/} Gallagher, NRC Staff prepared testimony in response to Stamiris Contention No. 1 at p. 13, following Tr. 1566.

^{385/} Gallagher, Tr. 2336-38.

^{386/} Id.

127. Steven H. Howell testified that while he had responsibility for Midland he never instructed any of his employees to withhold the information concerning the Administration Building grade beam failure settlement from the NRC.^{387/} In fact, Mr. Howell could recollect no instance where anyone within Consumers Power or Bechtel ever raised the question of whether the NRC should be informed of the Administration Building grade beam failure in the first place.^{388/} Similarly, Mr. Keeley, the Consumers Power Project Manager, testified that there had never been an intent or effort to keep the information concerning the Administration Building grade beam failure from the NRC.^{389/}

128. Mr. Gallagher agreed that he had no evidence and no reason to believe that anyone from Consumers Power intentionally withheld information concerning the Administration Building grade beam failure from him.^{390/} He admitted that no one from the NRC ever expressed a concern about the withholding of the Administration Building information to Consumers Power Company prior to the filing of his prepared testimony.^{391/} Nor was the Administration Building ever a subject of any investigation report.^{392/}

^{387/} Howell, Tr. 2929.

^{388/} Howell, Tr. 2929.

^{389/} Keeley, Tr. 1319.

^{390/} Gallagher, Tr. 2594-95; 2557-58; 2357-42.

^{391/} Gallagher, Tr. 2554.

^{392/} Gallagher, Tr. 2554-55.

129. The example goes on to allege that Consumers Power discussed the Administration Building settlement problem with their consultants prior to informing the NRC of the problem. This implies that Consumers Power considered it important enough to discuss it with their own soils consultants. In support of this, Ms. Stamiris submitted Exhibit 6, a summary of a meeting held on September 28, 1978, between Consumers Power consultants, including Dr. Peck, and Bechtel and Consumers Power employees.^{393/} No NRC personnel were present at that meeting.^{394/} The subject of the meeting was "settlement of structures supported by fill."^{395/} A notation in the document states "the Southwest corner of the Turbine Building has settled three-quarters of an inch since May of 1977. It may have been influenced by the adjacent excavation for the Administration Building."^{396/} Although he was not at the meeting, Mr. Gallagher gave his opinion that the excavation discussed at the meeting had to do with the Administration Building settlement.^{397/}

130. Dr. Ralph B. Peck could not recall ever receiving or studying any Bechtel reports on the Administration Building settlement.^{398/}

^{393/} Stamiris Exhibit No. 6.

^{394/} Gallagher, Tr. 2533.

^{395/} Gallagher, Tr. 2533.

^{396/} Gallagher, Tr. 2533; Stamiris Exhibit No. 6, at p. 2, paragraph B.

^{397/} Id.

^{398/} Peck, Tr. 3439.

131. Dr. Alfred H. Hendron, another Bechtel soils consultant, testified that he learned of the problem with the visit to the plant site, in October of 1978.^{399/} However, he could not recall whether he was affirmatively told about this by the Consumers Power or Bechtel personnel or whether through his own questioning he elicited the response from them.^{400/} He could not remember, either, who told him about the Administration Building settlement, or what detail he was given.^{401/}

132. Mr. Gallagher stated that no adverse health or safety problems arose because of any delay in the NRC learning about the Administration Building grade beam settlement.^{402/} Further, even if there had been a delay from October 1978 to December 1978 in informing the NRC of the Administration Building settlement, Mr. Gallagher admitted it neither affected his review of the diesel generator building settlement nor raised any safety concerns.^{403/} Finally, Mr. Gallagher agreed that the NRC was able to identify, with sufficient depth and understanding, the problems associated with the diesel generator building, without prior knowledge of the Administration Building.^{404/}

^{399/} Hendron, Tr. 4075.

^{400/} Hendron, Tr. 4076-77.

^{401/} Hendron, Tr. 4078.

^{402/} Gallagher, Tr. 2555-56.

^{403/} Gallagher, Tr. 2571.

^{404/} Gallagher, Tr. 2571.

133. We cannot agree that this example evidences Consumers Power management withholding information from the NRC. More importantly, no evidence has been produced to show that, if there was a withholding of information, it in any way was "relevant to health and safety standards with respect to resolving the soils settlement problem," as the contention alleges. The testimony of both Consumers Power and the NRC shows that the Administration Building problem was not required to be reported to the NRC under any existing regulations. Furthermore, the NRC has testified that even if there was a delay in its learning about the settlement from October to December 1978, that delay has no safety implications.

134. We find it difficult to understand the implication in the contention that the Administration Building settlement problem was relevant enough to discuss with the Consumers Power consultants but was actually withheld from the NRC. The consultants' testimony on this matter indicates that they and Consumers Power Company found little, if any, relevance in the Administration Building settlement. Dr. Peck could not recall discussing the Administration Building at all. Dr. Hendron stated that it was mentioned to him at his first visit, but he could not recall the circumstances of this discussion. Indeed, Mr. Gallagher could not describe any implication regarding management attitude to the fact that one or two of the consultants might have been informed

of the Administration Building grade beam failure prior to the NRC.

135. We find that Consumers Power management did not withhold information concerning the Administration Building grade beam failure from the NRC. And, although the NRC learned of the Administration Building grade beam failure only upon a second visit to the Project in 1978, we cannot say this is significant enough to form the basis of a finding that the management attitude at Consumers Power is inadequate in regard to reporting information.

(8) Contention No. 1, Example No. 6

Consumers Power Company statements and responses to NRC regarding soils settlement issues reflect a less than complete and candid dedication to providing information relevant to health and safety standards with respect to resolving the soils settlement problems as seen in:

Examples of information withheld or incorrectly given:

The false FSAR statements beyond the one cited as a "material false statement" in the December 6, 1979 Order, as discussed in the 4/3/79 Keppler-Thornburg memo and the 6/13/79 Thornburg-Thompson memo.

136. This contention example cites a series of inconsistencies discovered in the FSAR submitted by Consumers Power Company to the NRC.^{405/} The memoranda noted in it were prepared as part of the decisional process within the

^{405/} See Hood, NRC Staff prepared testimony in response to Stamiris Contention No. 1, Attachment Nos. 15 and 16, following Tr. 1560.

NRC to determine if these were "material false statements" and whether a civil penalty should be levied.406/

137. Darl Hood testified that none of cited FSAR statements, except the one the NRC alleges in Appendix B of the Modification Order, were material.407/ This means these statements could not have had an influence upon a safety conclusion of NRC personnel reviewing the FSAR.408/ Steven H. Howell described the process by which the FSAR is prepared.409/ He stated that the enormity of the FSAR in size and detail make such inconsistencies inadvertent.410/ Although both Mr. Hood and Mr. Gallagher asserted that the actual inconsistencies in the FSAR could have been avoided, Mr. Hood admitted that inconsistencies in the FSAR of other projects are not uncommon.411/ Mr. Gallagher also testified that, although inconsistencies can be prevented by attention to detail, they are inevitable in some cases because of the FSAR's size.412/

406/ Hood, Tr. 2643-47.

407/ Hood, Tr. 2647-49; Hood, NRC Staff prepared testimony in response to Stamiris Contention No. 1 at 14-15 and Attachment No. 17, following Tr. 1560.

408/ Id.

409/ Howell, prepared testimony at pp. 16-18, following Tr. 2802.

410/ Id.

411/ Hood, Tr. 2666-2667.

412/ Gallagher, Tr. 2414-16.

138. We cannot agree with the contention that the statements cited in the memoranda are indicative of Consumers Power management's lack of dedication to complete disclosure of information. As noted above, once the inconsistencies were made known to Consumers Power management, they instituted an extensive FSAR review program to verify the accuracy of its commitments. As a part of the program, all inconsistencies that were located were corrected, and procedures were established to prevent any further inconsistencies. Finally, as the NRC admits, these examples have no safety implications. We cannot, therefore, accept these examples as providing support for the contention.

(9) Consumers Power's Management Attitude
Regarding Providing Information to the NRC

139. We find that none of the examples cited by Ms. Stamiris in her Contention 1 either separately or taken as a whole support the premise that Consumers Power management was somehow remiss in providing safety information to the NRC. At most, some of them present technical judgment disputes between the NRC and Consumers Power. But none rises to the level of any sort of recalcitrance on the part of company management requiring a supervision beyond that already mandated by law and regulation. The evidence sponsored by both Consumers Power and the Staff show there has been at times a tension between them on various technical issues, including resolution of soils settlement issues. However, we cannot attribute that tension to an improper attitude on the part of Consumers Power management. The

Consumers Power witnesses impressed us as men who are and have been earnestly attempting to resolve their difference with the Staff. Based on the evidence we heard, the information supplied by Consumers Power to the Staff has been extensive and has attempted to address the technical issues raised by the Staff. In view of the detailed nature of this investigation, it is not surprising to observe certain isolated instances in which the Staff complained about the speed with which Consumers Power supplied information. As a whole, however, the company's effort to provide the Staff with soils settlement data has been effective and the isolated incidents in which there have been disagreements do not represent a pattern which could be attributed to improper management attitude. We therefore cannot agree that any "stricter than usual regulatory supervision" is needed for assurance that the soils settlement remedial measures are adequately effectuated.

1. Contention No. 2

140. In Contention No. 2, Ms. Stamiris sets forth a series of instances which she alleges exhibit the adverse effect that financial and scheduling pressures have had on the resolution of the soils settlement issues. She contends that these pressures have caused Consumers Power to compromise NRC health and safety regulations. Supplementing the incidents listed in her contentions is a series of examples from her Answers to Interrogatories filed April 20, 1981.

141. The Licensing Board received, and has now reviewed, extensive testimony and evidence presented on the issues of whether cost and scheduling pressures adversely affected either Consumers Power's managerial attitude or its resolution of the soils settlement issues. While the Staff and Consumers Power presented evidence directly addressing the examples contained in Ms. Stamiris's Answers to Interrogatories, the evidence presented by Staff and Consumers Power went well beyond the scope of these examples. Accordingly, our findings on the issues raised by Contention No. 2 are not limited to the examples enumerated by Ms. Stamiris, but deal with and are dispositive of the general issues of whether financial and scheduling pressures adversely affected resolution of soils settlement issues and led to the compromising of NRC health and safety regulations.

(1) Contention No. 2A, Example No. 1

Consumers Power Company's financial and time schedule pressures have directly and adversely affected resolution of soil settlement issues, which constitutes a compromise of applicable health and safety regulations as demonstrated by:

2A. Further examples of the effect of financial and time pressures on soil settlement issues:

1. 11/7/73 Bechtel action item: "proceed with preparations for preload as rapidly as possible"

142. This example is based on a portion of "Meeting Notes No. 882" by Mr. B.C. McConnel of Bechtel for a November 7, 1978 meeting between Consumers Power, Bechtel and Bechtel's consultants, which reads: "proceed with preparations for preload as rapidly as possible." Ms. Stamiris contends that the preparation for the preload in accordance with this memorandum adversely affected the resolution of soil settlement issues because "root causes were not adequately investigated and organizational deficiencies were not eliminated prior to proceeding with remediation."

143. The Staff has testified that matters of relevance to the quality assurance program were not completed prior to proceeding with the surcharge program.^{413/} The Staff contends that they expressed this concern to Consumers Power during a meeting held on December 4, 1978. At this meeting, the Staff stated that "while attention to remedial action is important determination of the exact cause is also quite

^{413/} Hood, NRC Staff prepared testimony in response to Stamiris Contention No. 2, following Tr. 2530.

important for verifying the adequacy of the remedial action, assessing the extent of the matter relative to other structures, and in precluding repetition of such matters in the future."^{414/} This testimony does not suggest that Consumers Power had not sufficiently investigated root causes prior to the institution of the surcharge.

144. Dr. Peck, one of the consultants upon whose recommendation Consumers Power adopted the preload remedy, testified as to the type of information he needed to know in order to have evaluated the technical adequacy of the surcharge remedy. This information included the general nature of the soils material which comprised the fill, the fact that the soils settlement had occurred under the fill's own weight, and the fact that the diesel generator building was partially completed.^{415/} This information was available to Dr. Peck when he recommended the surcharge option. This information was sufficient to determine that the preload was the appropriate remedy.^{416/}

145. With respect to any potential organization deficiencies, Dr. Peck testified that he was not concerned that the same personnel who had been involved in compacting the soils underlying the diesel generator building might also have been involved with the placement of the surcharge.^{417/}

^{414/} Id.

^{415/} Peck, Tr. 3219-20.

^{416/} Peck, prepared testimony at p. 2, following Tr. 3211.

^{417/} Peck, Tr. 3221-22.

This was because the previous compaction procedures were unrelated to the preload program and Dr. Peck would be in a position to review the preload program on an ongoing basis.^{418/}

146. Moreover, with respect to Ms. Stamiris' allegation that the preload was prematurely placed, it was only after Consumers Power had determined the cause of the soils settlement that the preload program was begun and construction work on the diesel generator building resumed.^{419/} Indeed, Consumers Power was aware of the Staff's findings in Inspection Report 78-20 before institution of the surcharge.^{420/} At the time the surcharge was approved, Consumers Power management was not aware of any deficiencies in either the quality assurance program or personnel qualifications as they related to the surcharge program.^{421/} The Staff also had no concerns with the quality assurance aspects of the preload program.^{422/}

147. Finally, the Staff was informed at the December 3 and 4, 1978 meeting that Consumers Power was going to proceed with the surcharge program.^{423/} The Staff never objected to the placement of the surcharge or claimed it was applied in haste.^{424/}

^{418/} Peck, Tr. 3221-23.

^{419/} Howell, prepared testimony at p. 21, following Tr. 2802.

^{420/} Gallagher, Tr. 2325.

^{421/} Howell, Tr. 2941.

^{422/} Hood, Tr. 4435.

^{423/} Hood, Tr. 4169, 2664.

^{424/} Hood, Tr. 2678.

148. Accordingly, the Board concludes that the root causes had been sufficiently investigated prior to the institution of the preload program, that there were no organizational deficiencies that had a bearing on the preload program and that these two factors did not adversely affect resolution of the soils settlement issues.

(2) Contention No. 2A, Example No. 2

Consumers Power Company's financial and time schedule pressures have directly and adversely affected resolution of soil settlement issues, which constitutes a compromise of applicable health and safety regulations as demonstrated by:

2A. Further examples of the effect of financial and time pressures on soil settlement issues:

2. 11/7/78 decision to fill pond "immediately, because the amount of river water available for filling is restricted"

149. This example is also based upon the "Meeting Notes No. 882" of Mr. B. C. McConnel, an employee of Bechtel, of the November 7, 1978 meeting between Consumers Power, Bechtel and Bechtel's consultants, which refers to the decision to fill the cooling pond "immediately, because the amount of river water available for filling is restricted." Ms. Stamiris alleges that raising the level of the cooling pond adversely affected the resolution of soil settlement issues since it "affected piezometric measurements during preload."

150. The record clearly establishes the scientific and technical reasons for Consumers Power's consultants' recommendation to raise the level of the cooling pond. The presence of large amounts of air in the plant fill would

have dramatically increased the complexities of measuring the settlement induced by the surcharge program. Both Dr. Hendron and Dr. Peck concurred in the decision to eliminate those complexities by submerging the tips of the piezometers by allowing the cooling pond level to rise. The effect of the presence of air in the fill soils would thus be minimized.^{425/}

151. While the Licensing Board agrees that a constant groundwater level would have been a convenience,^{426/} the record also demonstrates that this would have been extremely difficult, if not impossible, and was not in fact necessary for successfully monitoring the surcharge program.

152. First, there is no evidence that the groundwater levels beneath the diesel generator building would have reached a stable elevation.^{427/} Indeed, Dr. Peck testified that he would be surprised if an equilibrium could have been reached and preserved during the course of the preload because of construction activities.^{428/} Even if there had been no external events influencing ground water levels, it was impossible to predict how long it would take groundwater to reach an equilibrium.^{429/} There was no practical method

^{425/} Peck, prepared testimony at p.3, following Tr. 3211. .

^{426/} Peck, prepared testimony at p.3, following Tr. 3211.

^{427/} Peck, prepared testomony at p.3, following Tr. 3211.

^{428/} Peck, Tr. 3234.

^{429/} Peck, Tr. 3234.

for predicting how long it would take ground water levels to stabilize.^{430/}

153. Second, and more importantly, a constant ground-water level was not necessary for successfully monitoring soil settlement. A stable groundwater level would not have improved the accuracy of the interpretations of the piezo-meter readings.^{431/} As it was, there is no indication on the record that Consumers Power had any difficulty interpreting such data.^{432/}

154. Based on the foregoing considerations, Dr. Peck recommended at the November 7, 1978 meeting that the cooling pond level be allowed to rise as rapidly as possible. Dr. Peck also recommended that Consumers Power proceed with the surcharge program.^{433/} Dr. Peck testified that he had intended at this meeting to convey the need to both place the surcharge and raise the cooling pond level. These two operations could be carried out either concurrently or consecutively.^{434/}

155. It must be noted that the Staff testified that the best sequence for raising the level of the cooling pond and placing the surcharge was not used and that this may have

^{430/} Kane, Tr. 4421.

^{431/} Peck, Tr. 3252.

^{432/} Peck, Tr. 3464-65; Kane, Tr. 4415.

^{433/} Peck, prepared testimony at p.3, following Tr. 3211.

^{434/} Peck, Tr. 3464.

adversely affected the resolution of the soils settlement issues.^{435/} The Staff has not testified, however, and indeed there is no indication anywhere in the record, that the sequence actually used by Consumers Power did in fact adversely affect the resolution of the soils settlement issues. Moreover, it is not necessary that the best sequence be utilized, only an adequate one. The testimony was uncontroverted that an adequate sequence was actually used.

156. Accordingly, the Licensing Board finds that there was adequate technical support for Consumers Power's decision to concurrently raise the cooling pond level and place the surcharge, and rejects example 2 as any indication that financial and time pressures on Consumers Power adversely affected the resolution of soil settlement issues.

(3) Contention No. 2A, Example No. 3

Consumers Power Company's financial and time schedule pressures have directly and adversely affected resolution of soil settlement issues, which constitutes a compromise of applicable health and safety regulations as demonstrated by:

2A. Further examples of the effect of financial and time pressures on soil settlement issues:

3. 11/7/78 "5 month period is available in the schedule for preloading"

157. This example is also based on the aforementioned November 7, 1978 minutes. These minutes include the statement that a "5 month period is available in the schedule for preloading." Ms. Stamiris contends that NRC health and

^{435/} NRC Staff prepared testimony in response to Stamiris Contention 2 at p. 14, following Tr. 2530.

safety regulations were compromised by Consumers Power's decision to remove the surcharge at the end of this five month period, despite the NRC's lack of satisfaction that secondary consolidation had been achieved.

158. This example raises three distinct, albeit related, issues. The three questions are: (1) whether Consumers Power's decision to remove the surcharge was dictated by financial and scheduling considerations; (2) whether Consumers Power's action to remove the surcharge despite NRC disagreement as to whether secondary consolidation had been achieved compromises NRC health and safety regulations; and (3) whether the placement of the surcharge was of sufficient duration to adequately compact the soils underlying the diesel generator building.

159. It must be remembered that the subject of this partial initial decision is Consumers Power's managerial attitude and quality assurance program. Accordingly, findings as to the adequacy of the duration of the surcharge program will be deferred until after later hearings to be held on the adequacy of Consumers Power's remedial actions.

160. With respect to the first issue, there is no indication on the record that there were time constraints set which dictated and limited the duration of the surcharge program. Dr. Peck testified that no time constraints were set as to how long the preload could be left on.^{436/} Con-

^{436/} Peck, Tr. 3236, 3349.

struction personnel at the Midland site may have indicated that a preload program of five months duration would not significantly interfere with the construction schedule.^{437/} Dr. Hendron testified that the surcharge placement was not limited to this period, however, and that he and Dr. Peck did not pay any attention to such comments.^{438/} Removal of the surcharge was not approved until settlement and piezometric data conclusively demonstrated to the satisfaction of Drs. Peck and Hendron that the settlement induced by the surcharge had completed primary consolidation.^{439/} The timing of this approval was apparently unrelated to any predetermined duration.^{440/}

161. With respect to the second issue, nothing in the record indicates that the procedure by which Consumers Power decided to remove the surcharge, despite the NRC's disagreement as to whether secondary consolidation had been achieved, compromised NRC health and safety regulations.

162. Gilbert Keeley testified that the NRC was kept apprised on the progress of the preload program.^{441/} Indeed, the duration of the surcharge was discussed at a meeting held between the NRC Staff, Bechtel, Consumers Power, and

^{437/} Peck, Tr. 3236, 3349.

^{438/} Hendron, Tr. 4050; Peck, Tr. 3236, 3348-3349.

^{439/} Peck, prepared testimony at p. 4, following Tr. 3211.

^{440/} Id.

^{441/} Keeley, Tr. 1408.

the consultant on July 16, 1979.^{442/} Dr. Peck informed Staff when he felt the surcharge could be removed.^{443/} The Staff did not tell Consumers Power that the surcharge had not been on for a sufficient period^{444/} and in fact did not convey any negative comments or problems concerning surcharge removal.^{445/} Consumers Power, Bechtel and the consultants all had the impression that the Staff had accepted the surcharge program.^{446/} The Staff was notified of Consumers Power's intention to remove the preload prior to actual removal. The Staff did not object to its removal.^{447/}

163. There still remains a technical dispute between Staff and Consumers Power as to whether secondary consolidation of the fill material was achieved under the surcharge. Resolution of this issue, however, must await completion of the hearings on the adequacy of Consumers Power's remedial actions. The Licensing Board only finds, at this point, that financial and scheduling pressures, if in fact they existed, had no bearing on the duration of the surcharge, and the manner in which Consumers Power decided to remove the surcharge did not adversely affect resolution of the

^{442/} Hood, Tr. 2687.

^{443/} Keeley, Tr. 1408.

^{444/} Hood, Tr. 2687.

^{445/} Keeley, Tr. 1409.

^{446/} Keeley, Tr. 1409.

^{447/} Kane, NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p. 15, following Tr. 2530.

soils settlement issues and certainly did not compromise NRC health and safety regulations.

(4) Contention No. 2A, Example No. 4

Consumers Power Company's financial and time schedule pressures have directly and adversely affected resolution of soils settlement issues, which constitutes a compromise of applicable health and safety regulations as demonstrated by:

2A. Further examples of the effect of financial and time pressures on soils settlement issues:

4. Failure to grout gaps prior to cutting of duct banks, failure to cut condensate lines when first suggested, failure to break up mudmat at DGB.

164. This example enumerates three omissions which Ms. Stamiris contends resulted in additional stresses to the DGB which could have been avoided. Each omission is dealt with individually below.

(A) Failure to grout gaps prior to cutting of duct banks

165. Mr. McConnel's meeting notes of the November 7, 1978 meeting between representatives of Consumers Power, Bechtel and the Consultants includes the statement that "[i]t was pointed out that from a safety and a building distress point of view, it would be advisable to grout existing gaps [under the diesel generator building] prior to releasing duct banks."^{448/}

166. Grouting was an alternative which, on further consideration after the November 7 meeting, was determined

^{448/} Stamiris Exhibit No. 16

to be unnecessary.^{449/} There was uncertainty as to whether grouting would have been beneficial or not. The decision not to grout likely allowed some immediate stress relief to portions of the diesel generator building when the duct banks were released. There is uncertainty as to whether there would have been a beneficial reduction in stress to other portions of the diesel generator building had grouting actually occurred.^{450/} Failure to grout does not appear to have affected in any way the effectiveness of the preload program.^{451/} The Staff was unable to conclude that the grouting would have been the better approach.^{452/}

167. While the records demonstrate that Consumers Power did not grout the diesel generator building, there is no indication either that this alternative was rejected due to financial and scheduling pressures, rather than good cause, or that failure to grout compromised NRC health and safety regulations.

(B) Failure to cut condensate lines when first suggested

168. There are two condensate pipes which pass under the diesel generator building. Prior to institution of the

^{449/} Peck, Tr. 3365-66; Kane, NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p. 17, following Tr. 2530.

^{450/} Kane, NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p. 17-18, following Tr. 2530.

^{451/} Hendron, Tr. 4102-03.

^{452/} Kane, NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p. 17-18, following Tr. 2530.

preload, there was a concern that the condensate pipes under the north side of the diesel generator building were preventing the diesel generator building from settling uniformly, i.e. acting as a "hard spot", and thus imposing stress on the diesel generator building.^{453/} To remedy the situation, the condensate pipes under the north side were cut and this was apparently sufficient to relieve building stress.^{454/} The condensate lines on the south side were not cut because it was not thought to be necessary.^{455/}

169. Dr. Hendron was the consultant who originally recommended that the condensate pipes under the diesel generator building be cut. Dr. Hendron testified that Consumers Power followed his recommendation.^{456/}

170. There is no evidence that Consumers Power's decision not to cut the condensate pipes under the south side of the diesel generator building was even influenced, much less caused, by financial or scheduling pressures. Neither is there evidence that Dr. Hendron's recommendation concerning the condensate pipes was not followed when first suggested, or even that the failure to cut the south-side pipe had health and safety implications.

^{453/} Hood, Tr. 4181.

^{454/} Id.

^{455/} Id.

^{456/} Hendron, Tr. 4059.

(C) Failure to break up mudmat

171. Ms. Stamiris alleges that Consumers Power's decision not to break up the mudmat under the diesel generator building exemplifies how financial and scheduling pressures have adversely affected resolution of soils settlement issues and compromised health and safety regulations. This allegation cannot be supported in light of the evidence of record.

172. The mudmat underlying the diesel generator building was poured on the surface of the fill and served to keep mud out of construction work. The thickness of the concrete varied from a few inches to approximately a foot and was placed as the construction work progressed.^{457/}

173. Neither Dr. Peck nor Dr. Hendron could recall having recommended breaking the mudmat up.^{458/} These consultants were unsure whether breaking up the mudmat was even desirable.^{459/} It may be that the decision not to break up the mudmat lessened the stress on the diesel generator building during the surcharge.^{460/} The record is clear, however, that the fact that the mudmat might have remained intact is of no significance. The mudmat has nothing to do

^{457/} Peck, Tr. 3383-84.

^{458/} Peck, Tr. 3383; Hendron, Tr. 4078.

^{459/} Peck, Tr. 3383.

^{460/} Kane, NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p. 18-19, following Tr. 2530.

with the structural behavior of the diesel generator building^{461/} and, were the mudmat to crack at some later date, it would not affect the diesel generator building.^{462/}

174. In summary, the Licensing Board finds that none of the items listed by Ms. Stamiris in Example Four adversely affected resolution of soils settlement issues, were the result of financial or schedule pressures, or compromised NRC health and safety regulations.

- (5) Contention No. 2A, Examples Nos. 5 and 9, and
Contention No. 2D

Consumers Power Company's financial and time schedule pressures have directly and adversely affected resolution of soil settlement issues, which constitutes a compromise of applicable health and safety regulations as demonstrated by:

- 2A. Further examples of the effect of financial and time-pressures on soil settlement issues:
 - 5. Choice to continue construction of DGB
 - 9. Installation of preload instrumentation was subject to time pressure assoc. with frost protection considerations
- 2D. continued work on the diesel generator building while unresolved safety issues existed, which precluded thorough consideration of Option 2 - Removal and Replacement Plan.

175. These contentions deal with the general allegation that Consumers Power did not thoroughly consider the removal and replacement option, that is the removal and replacement of the current compacted fill, because Consumers Power continued construction on the diesel generator building and

^{461/} Peck, Tr. 3385.

^{462/} Hendron, Tr. 4103.

expended money for instrumentation to monitor the surcharge program prior to its formal decision to implement the preload program.

176. Construction of the diesel generator building began in October 1977.^{463/} Construction of the diesel generator building was suspended on August 23, 1978, shortly after discovery of the diesel generator building's excess settlement.^{464/} As of that date 55% of the concrete for the generator building had been placed, including the walls up to an elevation of 30 feet above grade, the generator pedestals, the mudmat poured inside the building, and the electrical duct banks. The underground piping in the area under and adjacent to the diesel generator building had also been installed and the backfill placed up to grade level.^{465/}

177. Shortly after the settlement problem was discovered, a Task Force made up of Consumers Power and Bechtel personnel was formed to resolve the technical issues relating to foundation soils.^{466/} In September, 1978, Drs. Ralph Peck and Alfred Hendron were retained as consultants and members of the Task Force to assist in the evaluation of data and feasibility of corrective actions.^{467/} The first major

^{463/} Keely, prepared testimony at p. 5, following Tr. 1163.

^{464/} Keely, prepared testimony at p. 6, following Tr. 1163.

^{465/} Id.

^{466/} Keeley, prepared testimony at p. 7, following Tr. 1163.

^{467/} Keeley, prepared testimony at p. 8, following Tr. 1163.

issue facing the task force was to determine what was to be done about the diesel generator building settlement problem.^{468/}

178. Ms. Stamiris contends that the removal and replacement option was eliminated, for all practical purposes, sometime in October 1978. One of her bases for this contention is a letter Dr. Hendron wrote to Sharif Afifi, a Bechtel engineer. This letter summarized a meeting held in Champaign, Illinois on November 7, 1978 between Consumers Power, Bechtel, and their consultants. This letter set forth the alternatives for remedying the soils problem considered at this meeting. This letter did not include the option of the removal and replacement of the soil, although it does contain a discussion of the removal and replacement of the diesel generator building.^{469/}

179. Dr. Hendron testified that this letter does not accurately reflect the discussion at the November 7 meeting because the removal and replacement of both the fill and the diesel generator building was discussed.^{470/}

180. Ms. Stamiris also cited Consumers Power's expenditures on preload instrumentation and the continued construction on the diesel generator building to support her allegation that Consumers Power did not thoroughly consider the removal and replacement option.

^{468/} Id.

^{469/} Stamiris Exhibit No. 22.

^{470/} Hendron, Tr. 4044-48.

181. The fact that Consumers Power installed preload monitoring instrumentation prior to formally adopting the preload option does not mean that financial or scheduling processes prematurely bound Consumers Power to the surcharge program.

182. Dr. Hendron testified that all options, including that of removal and replacement, had been discussed openly at the November 8, 1978 meeting. Dr. Hendron also stated that the preload had not, for all practical purposes, been selected in October 1978, despite the installation of the preload related instrumentation.^{471/}

183. Moreover, Stephen Howell testified, and the Licensing Board agrees, that it was reasonable to move forward on acquiring this instrumentation before making the final decision as the appropriate remedial action.^{472/} The Task Force decided instrumentation associated with the proposed surcharge should be installed prior to the placement of frost protection.^{473/} The so-called "frost protection" consists of the placement of a thin layer of fill over existing grade to protect lower layers from freezing. "Frost protection" is a necessary first step in the preload process.^{474/} Because some of the instrumentation to be

^{471/} Hendron, Tr. 4074.

^{472/} Howell, Tr. 2885-86.

^{473/} Keeley, prepared testimony at pp. 8-9, following Tr. 1163.

^{474/} Id.

installed in connection with the proposed surcharge required excavation or sub-surface installation, it was advantageous to install such instrumentation prior to placement of the frost protection layer.^{475/} It is often prudent for an organization to move down parallel courses until a final decision is made.^{476/} Such was the situation in this case when the instrumentation installation cost involved was minimal^{477/} and the lead time had to be considered to preserve the option of the preload program.^{478/} The Staff has concluded that installation of the equipment prior to the formal adoption of the preload program did not adversely affect resolution of the soil settlement issues.^{479/}

184. Ms. Stamiris attempts to buttress her contention that financial and scheduling pressures forced Consumers Power to choose the preload option by contending that notes of the January 13, 1979 meeting demonstrate that Dr. Peck considered the removal and replacement alternative the best remedial option. These notes read, in pertinent part, that "short of removing all the fill above the hard glacial fill, a preload program would be the best approach."^{480/}

^{475/} Id.

^{476/} Howell, Tr. 2885-86.

^{477/} Keeley, prepared testimony at pp. 8-9, following Tr. 1163.

^{478/} Howell, Tr. 2885-86.

^{479/} Kane, NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p. 21, following Tr. 2530.

^{480/} Peck, Tr. 3341.

185. Dr. Peck testified that this portion of the meeting notes did not accurately represent his views.^{481/} Moreover, the record demonstrates that, contrary to Ms. Stamiris' allegation, that Drs. Hendron and Peck recommended the surcharge program after considering the removal and replacement option, and with no doubt that the surcharge program was the best option available.^{482/}

186. The removal and replacement option was not recommended because it would have led to a less satisfactory foundation than the compacted soils the preload program has provided.^{483/} Any fill compacted for the first time and then loaded will settle more on the first application of the load than subsequent applications of the same load.^{484/} Thus, the diesel generator building will settle less on the currently surcharged fill than it would on entirely new fill material. This is true even if the new fill material was compacted better than the original fill material.^{485/} The new fill material would still be susceptible to a certain amount of settlement under its own weight. Dr. Peck also testified that he took into account cost and schedule considerations in making his preload recommendation.^{486/} These

^{481/} Peck, Tr. 3343.

^{482/} Peck, Tr. 3387-89; Hendron, Tr. 4104.

^{483/} Peck, Tr. 3337-38.

^{484/} Peck, Tr. 3338.

^{485/} Peck, Tr. 3338-39; Hendron, Tr. 4047.

^{486/} Peck, Tr. 3354.

are appropriate considerations when evaluating alternative engineering solutions.^{487/}

187. The record also establishes that Consumers Power chose the surcharge option because it was the preferable alternative and not because of any financial or scheduling pressures.^{488/} The surcharge program was technically feasible, it was capable of solving the settlement problem and, because instrumentation could record its results, it was capable of producing physical proof in order to verify the surcharge results.^{489/} This is not to say, however, that cost and scheduling considerations did not weight in Consumers Power's decision to implement the surcharge program. These considerations were only taken into account, however, after the determination had been made that the preload was a technically viable solution.^{490/} The options for remedial work chosen by Consumers Power are naturally affected by such considerations, and, as the staff testified, this is not inappropriate so long as there is reasonable assurance that the health and safety of the public will be protected.^{491/}

188. Finally, the surcharge program was a prudent choice since it did not preclude the removal and replacement

^{487/} Id.

^{488/} Howell, prepared testimony at pp. 24-25, following Tr. 2802.

^{489/} Howell, prepared testimony at p.22, following Tr. 2892.

^{490/} Id.

^{491/} Kane, NRC Staff prepared testimony in response to Stamiris contention No. 2, at p. 21, following Tr. 2530.

option if in fact the preload failed to remedy the settlement difficulties.^{492/} This remained true even after work on the diesel generator building resumed. As noted in the staff's testimony, the removal and replacement option remains viable even now while construction on the diesel generator building continues, should it prove necessary.^{493/}

189. Once the preload was chosen, work on the diesel generator building recommenced.^{494/} The continuance of the work on the diesel generator building was done in accordance with the conclusion that the preloading of the building provided a safe and technically adequate means of remedying the settlement.^{495/} The concept of preloading involves adding excess weight to the building to force its ultimate settlement by compacting the soils beneath it.^{496/} Finishing the work on the building could only add to its weight -- and therefore aid the end result of the remedy.^{497/} This was done in accordance with the recommendations of Consumers Power's experts.^{498/} Furthermore, the Staff testified that

^{492/} Howell, prepared testimony at p.22, following Tr. 2802.

^{493/} Hood, NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p. 11, following Tr. 2530.

^{494/} Howell, prepared testimony, p. 21.

^{495/} Id.

^{496/} Id.

^{497/} Id.

^{498/} Id.

the decision to continue construction of the diesel generator building did not eliminate the removal and replacement option and it did not have an adverse effect on the resolution of the soil settlement problem.^{499/}

190. Therefore, the Licensing Board finds that financial and scheduling pressures did not preclude Consumers Power from thoroughly evaluating the removal and replacement option, and, further, the fact that Consumers Power continued construction on the diesel generator building and installed monitoring instrumentation prior to formally deciding to implement the surcharge program did not compromise NRC health and safety regulations.

(6) Contention No. 2A, Example No. 6

Consumers Power Company's financial and time schedule pressures have directly and adversely affected resolution of soil settlement issues, which constitutes a compromise of applicable health and safety regulations as demonstrated by:

- a) the admission (in response to §50.54(f) question #1 requesting identification of deficiencies which contributed to soil settlement problems) that the FSAR was submitted early due to forecasted OL intervention, before some of the material required to be included was available;
- 2A. Further examples of the effect of financial and time pressures on soil settlement issues:
Table A
- 6. Early FSAR submittal and inadequate review of FSAR

^{499/} Kane, NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p.19, following Tr. 2530; Kane, Tr. 4308.

191. These two contentions are drawn from Consumers Power's response to 50.54(f) Request 1, Part b (page 1-2 of NRC Requests Regarding Plant Fill) which explained certain contradictions between the Midland PSAR and FSAR. This response reads, in pertinent part, that:

The Midland FSAR was submitted to the NRC at an earlier point in the project schedule than would have normally occurred, in order to provide additional time for the operating license hearings due to the forecasted intervention. Consequently, some of the material required to be included in the FSAR was not available at the time of its initial submittal, or was supplied based upon preliminary design information. As the design and construction continued, the appropriate sections of the FSAR were revised or updated to include the necessary information.^{500/}

192. Ms. Stamiris regarded this as an "admission" that "the FSAR was submitted early due to forecasted OL intervention, before some of the material required to be included was available." Ms. Stamiris contends that the FSAR's early submittal and its inadequate review adversely affected soil settlement issues by precluding early detection of inconsistencies, the detection of which could have prevented some of the soil settlement problems.

193. Consumers Power submitted the FSAR for the Midland units to the NRC on August 29, 1977.^{501/} The NRC performed an acceptance review pursuant to 10 CFR §2.101 and by letter dated November 11, 1977, advised Consumers Power that the

^{500/} NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p. 7, following Tr. 2530.

^{501/} Hood, NRC Staff prepared testimony in response to Stamiris Contention 2, at p. 7, following Tr. 2530.

tendered FSAR was sufficiently complete to be accepted for docketing. The Midland FSAR was docketed on November 18, 1977.^{502/}

194. Mr. Stephen Howell, Executive Vice President, Energy Distribution and General Services, for Consumers Power, explained that the FSAR was submitted early in order to provide adequate time for technical review of the FSAR by the NRC Staff while still accomodating an anticipated protracted hearing.^{503/}

195. This contention alleges no conduct that is in any way improper. As noted, Consumers Power's early submission of the FSAR was prompted by an appropriate regard for the decisional process involved in deciding on an application for an operating license in a contested hearing. Section 2.101 of 10 CFR Part 2 clearly provides for supplementing or amending filed license applications, including FSAR's.^{504/} It is not unusual for the staff to accept an FSAR with the understanding that additional information will be submitted at a later date.^{505/}

196. Furthermore, there is no evidence on the record to indicate that the early submission of the FSAR resulted in

^{502/} Hood, NRC Staff prepared testimony in response to Stamiris Contention 2, at p. 19, following Tr. 2530; Hood, Tr. 3644.

^{503/} Howell, prepared testimony, p. 19-20, following Tr. 2802.

^{504/} NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p. 20, following Tr. 2802.

^{505/} Hood. Tr. 3692-93.

the failure to detect the inconsistencies between the Mid-land PSAR and FSAR or compromised NRC health and safety regulations. First, the contradictions were due to the inaccuracy of certain statements included in the FSAR and not because of information excluded from the early versions of the FSAR.^{506/}

197. Second, there was no evidence that had the FSAR been submitted at a later date that the inconsistencies would have been detected. FSAR sections are "inactive" and are not reviewed when they refer to design, procurement or construction activities which have been completed and when there are no recent document changes or NRC questions to prompt review. Consumers Power, in its response to 50.54(f) Request 1, page 1-3 of "Response to NRC Requests Regarding Plant Fill, Volume 1," stated that the FSAR and PSAR contained inconsistencies which related to the soils settlement issues and which were inactive during the time period from August 1977 to August 1978. During this period all major plant backfill operations were completed, no significant revisions to the related specifications or calculations were made and the two NRC questions received at the time related only to seismic considerations.^{507/} The NRC testified that had the FSAR been tendered as late as August 1978, rather than

^{506/} Hood, NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p. 8, following Tr. 2530.

^{507/} Hood, NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p. 20, following Tr. 2530.

August 1977, little or no detection of inconsistencies with respect to the soil settlement problems would have occurred. 508/

198. Accordingly, the Licensing Board finds that the FSAR as submitted was sufficiently complete, and that early submittal of the FSAR was not made for improper motives and did not preclude an early detection of inconsistencies. Thus, early submittal of the FSAR did not adversely affect resolution of soil settlement issues and did not constitute a compromise of applicable health and safety regulations.

(7) Contention No. 2A, Example No. 7

Consumers Power Company's financial and time schedule pressures have directly and adversely affected resolution of soil settlement issues, which constitutes a compromise of applicable health and safety regulations as demonstrated by:

2A Further examples of the effect of financial and time pressures on soil settlement issues:

7. Failure to reconstruct geometry of area prior to fill placement, failure to await NRC approval before proceeding with Preload, selection of "least costly feasible alternative" for DGB.

199. In this example, Ms. Stamiris sets forth three "failures" which she contends adversely affected the resolution of soil settlement issues and which assertedly illustrate how Consumers Power sacrificed varying degrees of caution and conservatism in favor of cost and schedule advantages. Each "failure" is dealt with individually.

- (A) Failure to reconstruct geometry of area prior to fill placement.

200. The Staff stated that since it was uncertain as to the meaning of "reconstruct geometry of area" it was unable to respond to this aspect of the contention.^{509/} Consumers Power likewise could not respond. Ms. Stamiris offered no evidence on this contention. The Licensing Board agrees with both the Staff and Consumers Power. This allegation is vague, uncertain and unable to be dealt with. Accordingly, this Licensing Board finds that Ms. Stamiris has not defined this issue sufficiently to warrant this Board's consideration.

- (B) Failure to await NRC approval before proceeding with preload.

201. This alleged "failure" raises the question whether Consumers Power's decision to proceed with the preload program prior to receiving NRC approval illustrates how financial and scheduling pressures adversely affected resolution of the soils settlement issues and compromised health and safety regulations. The Licensing Board concludes that it does not.

202. First, there is no indication that Consumers Power's decision to proceed with the surcharge program at the time that it did was dictated by financial or scheduling pressures. Second, nothing in the record indicates that the procedure by which Consumers Power decided to proceed with

^{509/} Kane, NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p. 20, following Tr. 2530.

the preload was improper or compromised health and safety regulations.^{510/}

203. Prior to placement of the surcharge, Consumers Power personnel, Bechtel Engineers and consultants met with NRC personnel, including Darl Hood and Dr. Lyman Heller, the NRC's chief geotechnical reviewer, at Midland, Michigan on December 3 and 4, 1978.^{511/} At this meeting, the history of the soil problem was reviewed, the site exploration program was described and various aspects of the preload program were described and discussed.^{512/} The NRC Staff did not tell Consumers Power not to proceed with the preload.^{513/} Further, the Staff has concluded that the failure to await NRC approval before proceeding with the preload did not adversely affect resolution of the soil settlement issues.^{514/} Consumers Power was not required to await NRC approval. Both Consumers Power and the NRC staff recognized that the preload was done at Consumers Power's financial risk.^{515/} If Consumers Power does not satisfy the NRC Staff or this Board that the preload program has resulted in reasonable

^{510/} Kane, NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p. 20, following Tr. 2350.

^{511/} Keeley, prepared testimony at p. 9, following Tr. 1163.

^{512/} Id.

^{513/} Hood, Tr. 2678.

^{514/} Kane, NRC Staff prepared testimony in response to Stamiris Contention 2 at p. 21, following Tr. 2530.

⁵¹⁵ Howell, Tr. 2829; Hood, Tr. 2678-79.

assurance that the fill material has been adequately compacted so that there is reasonable assurance that the public health and safety is protected, Consumers Power can be required to pursue the removal and replacement option at that time.

204. Therefore, the Licensing Board finds that the failure to await NRC approval before proceeding with the preload was not dictated by financial and scheduling pressures, and has not adversely affected resolution of the soils issues.

(C) Selection of least costly feasible alternative for DGB.

205. The issues surrounding the manner in which Consumers Power chose the surcharge option to remedy the diesel generator building excess settlement were considered in the foregoing section which dealt with Stamiris Contentions 2A, examples 5 and 9, and 2D.

(8) Contention No. 2A, Example No. 8

Consumers Power Company's financial and time schedule pressures have directly and adversely affected resolution of soil settlement issues, which constitutes a compromise of applicable health and safety regulations as demonstrated by:

2A. Further examples of the effect of financial and time pressures on soil settlement issues:

8. Failure to excavate loose sands as committed to in PSAR

206. On February 24, 1978, the NRC issued FSAR Request No. 362.2 which sought documentation concerning Consumers Power's PSAR commitment to remove naturally occurring loose

sand (sand with less than 75% relative density), if any, from beneath Class I and certain non-Class I structures.^{516/} The sands referred to are naturally occurring sands that were not placed as part of the fill.^{517/}

207. According to the Staff, the documentation concerning the loose sand removal supplied by Consumers Power in response to this request failed to demonstrate that all loose sands had been removed.^{518/} As a result, Consumer Power took steps, including an analysis of borings, to ensure that loose sands were not present, and documented its results for the NRC in its response to FSAR Request 362.2.^{519/} On the basis of this analysis, it was concluded that the naturally occurring sands at the site met density requirements (they were not classified as "loose"), with the exception of a few isolated lenses of no significance to Category I Structures.^{520/} The matter was discussed with the NRC

^{516/} Keeley, prepared testimony p. 16, following Tr. 1163; Kane, NRC Staff prepared testimony in response to Stariris Contention No. 2 at p. 22, following Tr. 2530.

^{517/} Kane, Tr. 4366.

^{518/} Keeley, prepared testimony at p. 16; Kane, NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p. 22, following Tr. 2530. Kane, Tr. 4364-65.

^{519/} Keeley, prepared testimony at p.16, following Tr. 1163.

^{520/} Keeley, prepared testimony at p. 16, following Tr. 1163. Kane, Tr. 4365.

Geotechnical Section on April 10, 1979, and was considered a closed issue.^{521/}

208. On the basis of these facts the Staff was unable to conclude either that Consumers Power had failed to excavate "loose" sands or, even assuming the presence of loose sands, that a failure to remove such sands contributed to the inadequacy of the subsoils.^{522/}

209. With respect to Ms. Stamiris' Contention, an examination of the record reveals that "financial and time pressures" had no bearing at all on the resolution of the loose sands question.^{523/} Quite the contrary, Consumers Power took the necessary steps and incurred the necessary expense, in terms of both time and money, to ensure that this question was satisfactorily resolved.^{524/}

210. Consequently, the Licensing Board finds that the resolution of the loose sands question had no relationship to financial and time pressures and did not compromise applicable health and safety issues, and that there is no basis for concluding that it contributed to the inadequacy of the subsoil.

^{521/} Keeley, prepared testimony at p. 16, following Tr. 1163.

^{522/} Kane, NRC Staff prepared testimony in response to Stamiris Contention No. 2 at p. 22, following Tr. 2530; Kane, Tr. 4381.

^{523/} Keeley, prepared testimony at pp. 16, 17, following Tr. 1163.

^{524/} Id.

(9) Contention No. 2A, Example No. 10.

Consumers Power Company's financial and time schedule pressures have directly and adversely affected resolution of soil settlement issues, which constitutes a compromise of applicable health and safety regulations as demonstrated by:

2A Further examples of the effect of financial and time pressures on soil settlement issues:
Table A

10. Appeals to NRC to consider financial plight and schedule deadlines as in Seismic Deferral Motion.

211. We start by reiterating this Board's previous statements made in connection with the admission of Ms. Stamiris' contentions, that Consumers Power's legitimate exercise of

legal rights or processes under law is not subject to our scrutiny.^{525/}

212. On March 18, 1981, Consumers Power filed a motion to defer consideration of certain seismic questions until the operating license hearing ("seismic deferral motion"). Consumers Power's reasons for filing the seismic deferral motion are set out in the motion itself and in the supporting affidavits. Briefly, Consumers Power maintained that it would be beneficial to the overall public interest, and to its own interest, to defer consideration of certain issues relating to the seismic criteria to be used at the Midland Project.

213. Shortly after the motion was filed, Consumers Power and the NRC Staff entered into a stipulation resolving the seismic deferral issues; the Board later adopted this stipulation as a satisfactory resolution of the issues raised in the Consumers Power's motion.^{526/}

214. The record contains no support for Ms. Stamiris' allegation that the filing of the seismic deferral motion adversely affected the resolution of soils issues, or was motivated by a desire to elevate cost and schedule concerns over the safe and proper resolution of soil settlement issues.

^{525/} Prehearing Conference Order ruling on Contentions and on Consolidation of Proceeding (October 24, 1980), pp. 5-6.

^{526/} Tr. 930 - 943.

215. Mr. Darl Hood, the NRC's Midland Project Manager, testified that the adoption of the stipulation involved no compromise of the applicable health and safety regulations. He noted that even after the resolution of the seismic deferral motion, the Staff was still receiving all the information it needed to conduct a proper seismic review.^{527/}

216. Accordingly, the Licensing Board finds that Consumers Power's seismic deferral motion was not motivated by financial and time pressures and did not adversely affect resolution of soil settlement issues.

(10, Contention No. 2A, Example No. 11

Consumers Power Company's financial and time schedule pressures have directly and adversely affected resolution of soil settlement issues, which constitutes a compromise of applicable health and safety regulations as demonstrated by:

2A. Further examples of the effect of financial and time pressures on soil settlement issues:

11. Depth and breadth of surcharge limited by practical consideration of DGB, Turbine B. structures.

217. Ms. Stamiris contends that the depth and breadth of the surcharge was limited by practical considerations of the diesel generator building and Turbine Building Structures, and that this afforded less than optimum conditions for the surcharge. The record does not support this allegation.

218. Dr. Peck stated that when surcharging was being considered, a review of available space was made to determine

^{527/} Hood, Tr. 4368; Hood, NRC Staff prepared testimony in response to Stamiris Contention No. 2, at p. 22, following Tr. 2530.

whether there was insufficient area to place the amount of surcharge fill needed to achieve the necessary stress levels in the subsoil.^{528/} The review demonstrated that there was adequate area and vertical space available to obtain needed surcharge stresses, with the exception of the area immediately adjacent to the Turbine Building.^{529/} There a retaining wall system was constructed to permit placement of enough surcharge to achieve the needed stress levels.^{530/} Thus conditions for the surcharge were fully sufficient to achieve the desired result.^{531/} The fact that Consumers Power spent the time and money necessary to build the retaining wall illustrates that the preload program was not adversely affected by financial and time schedule pressures.

219. Dr. Hendron testified that his concerns and recommendations regarding reinforcement of the turbine building wall were followed.^{532/} He also testified that he did not believe that the limitations on preload due to the turbine building in any way affected the ultimate settlement of the diesel generator building.^{533/} The fact that the diesel generator building settled less on the side nearest

^{528/} Peck, prepared testimony at p. 5, following Tr. 3211.

^{529/} Id.

^{530/} Id.; Hendron, Tr. 4064.

^{531/} Peck, prepared testimony at p. 5, following Tr. 3211; Hendron, Tr. 4108, 4064.

^{532/} Hendron, Tr. 4063.

^{533/} Hendron, Tr. 4064.

the Turbine Building (the north side) was due to the type of soils underneath that side of the diesel generator building rather than the magnitude of the preload.^{534/} Moreover, the surcharge loads were adequate for they exceeded the expected load of the diesel generator building at all points.^{535/}

220. The NRC Staff agrees with Consumers Power that the smaller amount of settlement that was experienced on the north side of the diesel generator building was not the result of surcharge load.^{536/} Joseph Kane agreed with Dr. Hendron that the cause of the differential settlement was compressibility of the underlying materials.^{537/}

221. The Board concludes that conditions adequate to accomplish the purposes of the surcharge program, not optimum conditions, were what was necessary for surcharge placement; that such conditions existed; that Consumers Power disregarded financial and time schedule pressures when it constructed the retaining wall; that the placement of the surcharge given the location of the diesel generator building and location of the turbine building did not adversely affect the resolution of the soil settlement issues.

^{534/} Id.

^{535/} Hendron, Tr. 4108.

^{536/} Kane, Tr. 4363.

^{537/} Id.

(11) Contention No. 2A, Example No. 12

Consumers Power Company's financial and time schedule pressures have directly and adversely affected resolution of soil settlement issues, which constitutes a compromise of applicable health and safety regulations as demonstrated by:

2A. Further examples of the effect of financial and time pressures on soil settlement issues:

12. Changes to design (DGB foundation), material, or procedural specifications without proper approval.

222. Ms. Stamiris's example No. 12 is vague and it is unclear whether "prior approvals" refers to approvals by the NRC or approvals within Consumers Power's or Bechtel's organization.

223. There is no evidence that the design changes to the diesel generator building foundation were carried out without proper Bechtel internal approvals. The evidence of record established that the design changes to the diesel generator building foundation had no effect on settlement calculations or other design parameters.^{538/}

224. Problems with procedures for modifying specifications were addressed by Consumers Power in its Response to Questions 23, 23-8-9^{539/} and the record indicates that this Response was adequate.^{540/}

^{538/} Marguglio, prepared testimony, Attachment No. 10 at pp. 23-12 through 23-13, following Tr. 1501.

^{539/} Marguglio, prepared testimony, Attachment No. 10 at 23-8 to 23-9, following Tr. 1501.

^{540/} Gilray, Tr. 3709.

225. Moreover, the record shows that Consumers Power was not required to await NRC approval before making changes to design, material or procedural specifications. Further such changes Consumers Power may have made to specifications were not motivated by financial or time pressures.^{541/}

226. The Licensing Board concludes that example No. 12 does not exemplify a situation where financial and time schedule pressures affected resolution of the soils settlement issues.

(12) Contention No. 2B

Consumers Power Company's financial and time schedule pressures have directly and adversely affected resolution of soil settlement issues, which constitutes a compromise of applicable health and safety regulations as demonstrated by:

2B. the choice of remedial actions being based in part on expediency, as noted in Consumer's Power Company consultant R. B. Peck's statement of 8-10-79.

227. Contention 2B is drawn from a presentation made by Dr. Ralph Peck at a meeting with the NRC Staff in July, 1979 in Bethesda, Maryland. This presentation was transmitted to the NRC Staff via a 10 CFR 50.55e Report dated August 10, 1979. Neither the report containing Dr. Peck's remarks nor the remarks themselves were offered into evidence.

228. The NRC Staff's understanding of Dr. Peck's statement is that the "proposed operations to underpin the electrical penetration area structures and feedwater isolation

^{541/} Hood, Tr. 4430.

valve pits were suitable for being completed within the construction schedule which existed at the time."^{542/}

229. The Staff did not regard Dr. Peck's statement as evidencing improper cost and schedule considerations affecting the remedial actions for the diesel generator building, since the statement itself did not eliminate the need for both NRC approval for a proper underpinning design and high quality construction with appropriate controls.^{543/}

230. Accordingly, the Licensing Board finds, as did the Staff, that Dr. Peck's statement was not indicative of cost and schedule concerns which had an adverse impact on the resolution of soil settlement issues.

(13) Contention No. 2C

Consumers Power Company's financial and time schedule pressures have directly and adversely affected resolution of soil settlement issues, which constitutes a compromise of applicable health and safety regulations as demonstrated by:

2C. the practice of substituting materials for those originally specified for "commercial reasons" (NCR QF203) or expediency, as in the use of concrete in electrical duct banks (p. 23 Keppler Report)*;

231. Stamiris Contention 2C identified two alleged instances where materials different from those originally specified were substituted for reasons of expediency. One such instance supposedly gave rise to NCR QF 203. According to uncontroverted testimony on the record, Ms. Stamiris' contention is premised on a misreading of NCR QF203.

^{542/} Kane, Tr. 3681-82.

^{543/} Id.

232. The NCR, which was written by Consumers Power's own quality assurance department, was written because materials ostensibly not in compliance with construction specifications were improperly accepted for use on the Midland Project.^{544/} The materials initially appeared to have been improperly received because they did not meet the standards found in the "receiving inspection plan" which is an internally developed document. After investigation, however, it was found that the materials in question complied with applicable construction specifications as outlined in design documents.^{545/} The receiving inspection plan, in this instance, was more stringent than the construction specification, which is the controlling document. Thus, the receiving inspection plan was incorrect and there was never any substitution of material.^{546/} Thus, NCR 203 is representative of the proper functioning of a quality assurance program, which operates by issuing NCR's, audit findings, and other written records of its discoveries.

233. The second instance identified in Example 12 is the substitution of lean concrete for Zone 2 material in the plant fill. Mr. Eugene Gallagher, who participated as a member of the NRC investigation team which inquired into the

^{544/} Marguglio, prepared testimony at p. 40-41, following Tr. 1424.

^{545/} Marguglio, prepared testimony at pp. 40-41, following Tr. 1424.

^{546/} Id.

circumstances surrounding the use of lean concrete, testified that this substitution had nothing to do with commercial expediency. Rather, the substitution occurred, in Mr. Gallagher's view, because of a design interface problem.^{547/} Moreover, Consumers Power testified that the specification in question clearly permitted the substitution of concrete, a point uncontested on this record.^{548/} Hence, there was no substitution of materials inconsistent with a specification, and the substitution which did occur was not because of commercial expediency.

234. Consumers Power disagreed with Mr. Gallagher's finding that the use of lean concrete were caused by a design interface problem. According to Consumers Power:

Use of lean concrete in restricted areas is a normal construction practice and was controlled by the field engineer's approval after inspection of the subgrade. Correspondence (BBBC-668 dated December 27, 1974) addresses the use of lean concrete as an acceptable replacement for Zone 1 and 2 materials only in areas of dike disturbed due to trenches or temporary excavations.^{549/}

Consumers Power, therefore, had an honest technical belief, which it still holds, that the substitution was technically sound.

^{547/} Gallagher, Tr. 2563-2567.

^{548/} Marguglio, prepared testimony at pp. 40-41, following Tr. 1424.

^{549/} Stamiris Exhibit B, Item 5, NRC Preliminary Finding 11.

235. Therefore, the Licensing Board finds that there is no evidence of poor attitude, and that the instances referred to in Example 12 do not indicate that financial and time pressures either encouraged Consumers Power to compromise health and safety regulations or adversely affected resolution of soils settlement problems.

Scheduling and Financial Pressures

236. We find that none of the instances set forth by Ms. Stamiris in her Contention No. 2 indicate that financial and scheduling pressures have adversely affected either Consumers Power's managerial attitude or its resolution of the soils settlement issues. We have also received into the record extensive evidence directly addressing the examples contained in Ms. Stamiris's Answers to Interrogatories. We have attempted to evaluate the record as a whole in determining whether financial and schedule considerations improperly influenced Consumers Power's management attitude and resolution of soils settlement issues. We find that they did not and that cost and schedule considerations were properly taken account of. They did not compromise proper resolution of the soils settlement issues.

3. Contention No. 3

237. Contention 3 lists a series of incidents which Ms. Stamiris alleges demonstrate a management attitude inappropriate to proper quality assurance implementation. According to the contention, the attitude is reflected in the "pattern of frequency" of quality assurance deficiencies during the construction of the plant which are continuing even today. The list includes: items identified in the NRC's initial soils Investigation Report 78-20, basis of the noncompliances in Appendix A of the Modification Order; the quality assurance deficiencies cited by the NRC in inspection reports and the SALP evaluation subsequent to the Modification Order; and the investigation conducted concerning the 1977 Administration grade beam settlement. The contention concludes that these represent a failure on the part of Consumers Power management to keep commitments they made in the past concerning quality assurance. It suggests that a similar commitment of proper quality assurance implementation involving soils settlement should only be evaluated in light of these asserted management failures in the past. We deal first with the specific instances cited by Ms. Stamiris. We conclude by making an overall appraisal of Consumers Power management attitude which cuts across the specific matters dealt with in each of the examples put forward by Ms. Stamaris.

(1) Contention No. 3(a)

Consumers Power Company has not implemented its Quality Assurance Program regarding soil settlement issues according to 10 CFR Part 50, Appendix B regulations, and this represents a repeated pattern of quality assurance deficiency [sic] reflecting a managerial attitude inconsistent with implementation of Quality Assurance Regulations with respect to soil settlement problems, since reasonable assurance was given in past cases (ALAB-100, ALAB-106 and LBP-74-71) that proper quality assurance would ensue and it has not.

The Quality Assurance deficiencies regarding soil settlement include:

- (a) 10 CFR Part 50, Appendix B, Criteria III, V, X as set forth in the Order of Modification.

238. Appendix A of the Modification Order lists several quality assurance Criteria from NRC regulations in 10 CFR Part 50, Appendix B and outlines specific incidents said to constitute infractions of these. Under "Criterion III -- Design Control" are cited six inconsistencies in the license application or design basis documents. Under "Criterion V -- Instructions, Procedures, and Drawings", Appendix A identifies one incomplete instruction and two incidents where the activities were not accomplished according to the instructions. Under "Criterion X -- Inspection," it alleges that a procedure failed to include inspection hold points. Under "Criterion XVI -- Corrective Action" it states that effective measures were not taken to preclude the repetition of several soils placement nonconformances. All these quality assurance deficiencies were identified in NRC Inspection Report IE-78-20. This documented the NRC investigation into the soils settlement at Midland's diesel generator

building during December 1978 and January 1979.^{550/} In paragraph 2 of the Stipulation, Consumers Power agreed not to contest the legal or factual basis for the Modification Order as it applied to quality assurance.^{551/}

239. Consumers Power responded to these specific quality assurance deficiencies in April and November 1979 in its responses to the 10 CFR §50.54(f) Questions 1 and 23.^{552/} Part I of the response to question 23 identifies the nature of each deficiency, its reference in Inspection Report 78-20, and the quality assurance program criteria in the NRC Regulations and Consumers Power quality assurance manual to which it relates.^{553/} It further establishes the root cause of each deficiency and the corrective actions taken to remedy the specific problem, and any programmatic and generic implications it might have had.^{554/}

Criterion III - Design

240. Three incidents under this criterion in the Modification Order -- items 1(a), 1(c) and 1(d) -- allege inconsis-

^{550/} Stamiris Exhibit No. 3, Attachment No. 7.

^{551/} NRC Staff/Consumers Power Quality Assurance Stipulation at 2, following Tr. 1175; LPB Memorandum and Order, Tr. 1172.

^{552/} Marguglio, prepared testimony, Attachment Nos. 9 and 10, following Tr. 1501.

^{553/} Id., Attachment No. 10.

^{554/} Id.

tencies in the Midland Project FSAR. Item 1(a) deals with an inconsistency in the FSAR-predicted settlement of the diesel generator building. Item (c) involves a conflict in the projected load density for the building as identified in a design document and the FSAR. Item 1(d) concerns a disagreement in the two indices of compressibility for diesel generator plant fill within the FSAR.

241. Item 1(b) of the Modification Order identifies an inconsistency in calculations in the primary design document for the diesel generator building and for the borated water storage tanks. It notes that the foundation calculations for these structures were at variance with the design assumptions for their foundations. Items 1(e) and 1(f) allege that certain Preliminary Safety Analysis Report ("PSAR") commitments were not properly translated into design documents. The specifications in design documents conflicted with those in a consultant report (Dames and Moore) submitted by Consumers Power as an attachment to the PSAR.^{555/}

242. Dr. Ross Landsman, a Region III Inspector, and John Gilray described at length the purposes and the NRC's use of the FSAR and associated design documents.^{556/} The FSAR is not used in the design of the plant itself. Rather it is a rendition or "history" of the way the plant was

^{555/} Marguglio, prepared testimony Attachment No. 9 at I-3 and Attachment No. 10 at 23-6, following Tr. 1501.

^{556/} Landsman, Tr. 4915-8.

built.^{557/} When the design documents conflict with the FSAR, generally it is the FSAR which is changed to reflect the information in design documents.^{558/} For example, in his review of construction activities, Dr. Landsman relies on the design document information, not the FSAR.^{559/} Ultimately, the NRR Staff employs the FSAR to conduct its operating license review of the plant. According to Dr. Landsman, the FSAR has little utility to the Staff prior to then.^{560/} Mr. Gilray, a reviewer from the NRR Branch concurred with this assessment. According to Mr. Gilray, within the context "of his terms," only a major FSAR modification can be viewed as "input."^{561/}

243. Consumer Powers' responses to 10 CFR §50.54(f) Questions 1 and 23 admit to the FSAR and design document inconsistencies.^{562/} The responses specify the particular

^{557/} Id.

^{558/} Id.

^{559/} Id.

^{560/} Id.

^{561/} Gilray, Tr. 5063.

^{562/} Item 1(a) is addressed in Consumers Power Response to 10 CFR §50.54(f) Question 23, Paragraph 3.3, Category I, item 3, p. 23-10 et seq., Marguglio, prepared testimony Attachment No. 10. at 23-10 et seq., following Tr. 1501; items 1(c) and 1(d) are addressed in Consumers Power Response to 10 CFR §50.54(f) Question 1, at 1-6-9, Marguglio, prepared testimony, Attachment No. 9 at 1-6-9, following Tr. 1501. Item 1(b) is addressed in Consumers Power response to 10 CFR §50.54(f) question 23 pp. 23-12 to 23-14, Marguglio, prepared testimony, Attachment No. 10 at 23-12, following Tr. 1501; items 1(e) and 1(f) are addressed in Consumers Power response to 10 CFR §50.54(f) question 1, Marguglio, prepared testimony, Attachment No. 9, following Tr. 1501.

procedural changes which have been implemented to prevent recurrence of the inconsistencies.^{563/} Among other things, the persons primarily responsible for reviewing documents for consistency are now specifically identified.^{564/} Because of the refinements in the system, and because one person is now held accountable for a task, the system provides better enforcement of procedures designed to maintain consistency between the FSAR and design documents.^{565/} Eugene Gallagher, the Region III inspector involved in the initial NRC soils investigation, inspected and approved the changes.^{566/}

244. Although admitting that inconsistencies in the FSAR are inevitable,^{567/} Mr. Gallagher stated that the existence of these particular inconsistencies reflected poorly on management's attention to detail during the time those portions of the FSAR were developed.^{568/} However, any concerns he may have had with this have been remedied. According to Mr. Gallagher, the present Consumers Power management is effectively controlling the design documents and the development of the FSAR.^{569/} The present Consumers

^{563/} Id.

^{564/} Gallagher, Tr. 1825.

^{565/} Gallagher, Tr. 1825.

^{566/} Gallagher, Tr. 1823-24.

^{567/} Gallagher, Tr. 2413-19.

^{568/} Gallagher, Tr. 2302.

^{569/} Id.

Power management's attitude, he testified, is consistent with the implementation of quality assurance regulatory requirements.^{570/}

245. Consumers Power question 23 response also describes the FSAR "re-review" effort.^{571/} This was an all-inclusive examination of over 1000 sections of the FSAR and the design documents used to develop the FSAR, intended to eradicate inconsistencies both within the FSAR and design documents.^{572/} Mr. Gallagher characterized it as a massive, "long and exhaustive task."^{573/} Although a procedural irregularity in the form reviewers used to document their work was discovered, the re-review itself was accurate.^{574/}

Criterion V - Instructions, Procedures, and Drawings

246. Appendix A of the Modification Order, Criterion V, dealing with instructions, procedures and drawings, lists three items as deficiencies. Item 2(a) concerns a field instruction which permitted lean concrete to be substituted for the other types of plant fill material. It alleges that the specifications should have included the conditions under

^{570/} Gallagher, prepared testimony at p. 5, following Tr. 1751.

^{571/} Maruguglio, prepared testimony, Attachment No. 10, Part 2, following Tr. 1501.

^{572/} Id.; Landsman, Tr. 4848.

^{573/} Gallagher. Tr. 2364.

^{574/} Gilray, Tr. 3745; Landsman, Tr. 4851; Bird, Tr. 3150-52; supra at p. 39-40.

which the substitution could be made. Item 2b(1) involved the use of informal methods for modifying construction specifications in use at the time of soils placement. Item 2(b)(2) cited the absence of a qualified geotechnical engineer during soils placement at the diesel generator building. Consumers Power had committed to have one present during soils work. By November 1979, in its response to 10 CFR §50.54(f) Question 23 Consumers Power had addressed all these items. Specifically, procedures for material substitutions were revised.^{575/} Formal procedures for modifying construction specifications were developed.^{576/} A review of old specifications were instituted to formalize any informal modifications made in the past.^{577/} Other procedures now require that a qualified geotechnical engineer be present at all soils placement activities.^{578/}

Criterion X - Inspection

247. Under Criterion X, Appendix A of the Modification Order identified a deficiency relating to an absence of

^{575/} Marguglio, prepared testimony, Attachment No. 10, following Tr. 1501; Staff Exhibit 1, at p. 4, item (6). See also supra p. 139.

^{576/} Id., Attachment No. 10, at p. 23-29.

^{577/} Id.

^{578/} Id., Attachment No. 10 at pp. 23-19 to 23-20.

"hold points" in soils activities. Consumers Power addressed this in its response to 10 CFR §50.54(f) Question 23. To remedy it, specific instructions now carefully regulate the quality control inspector's duties in evaluating soils activities.^{579/}

Criterion XVI - Corrective Action

248. Appendix A to the Modification Order under Criterion XVI, identified two items in which "soils conditions of adverse quality" were not corrected to preclude repetition. Item 4(a) alleged the absence of proper "moisture testing" procedures. Item 4(b) alleged that actions taken by Consumers Power were not adequate in preventing repeated non-conformances.

249. Consumers Power addressed these items in its response to 10 CFR §50.54(f) Question 23. The cause of the problem in item 4(a) was Bechtel's practice of conducting moisture tests following compaction rather than during compaction, as required by the specification.^{580/} The Staff has determined that the soil testing procedures are now adequate.^{581/} Consumers Power response to Item 4(b) con-

^{579/} Id., Attachment No. 10 at pp. 23-19, 23-20.

^{580/} Id., Attachment No. 10 at p. 23-23.

^{581/} Gallagher, Tr. 2594.

cerning repetitive nonconformances was directed at improving the "trending analysis" aspect of its quality assurance program.^{582/}

(2) Contention No. 3(b)

Consumers Power Company has not implemented its Quality Assurance Program regarding soil settlement issues according to 10 CFR Part 50, Appendix B regulations, and this represents a repeated pattern of quality assurance deficiency reflecting a managerial attitude inconsistent with implementation of Quality Assurance Regulations with respect to soils settlement problems, since reasonable assurance was given in past cases (ALAB-100, ALAB-106 and LBP-74-71) that proper quality assurance would ensue and it has not.

The Quality Assurance deficiencies regarding soils settlement include:

(b) 10 CFR Part 50, Appendix E, additional criteria denoted by roman numerals below:

- I. The Applicant has failed to assume responsibility for execution of the QA program through its failure to verify and review FSAR statements (pp. 6-8 and p. 21, Keppler Report) and through its reliance on final test results not in accordance with specified requirements (p. 16, Keppler Report);
- II. The QA program was not carried out according to written policies, procedures and instructions, in that oral directions were relied upon and repeated deviations from policies occurred regarding compaction procedures (p. 9-14, Keppler Report);
- VII. Control of purchased material has not been maintained, in that examination and testing of backfill materials did not occur in accordance with regulations (NCR QF 29, NCR QF 147);

^{582/} Marguglio, prepared testimony, Attachment No. 10 at pp. 23-32, following Tr. 1501; see supra, pp. 28-35.

- IX. Control of non-destructive testing was not accomplished by qualified personnel using qualified procedures regarding
 - (a) moisture control (Keppler Report p. 14-16; QA Request SD40, NCR QFS52, 127, 174 and 199);
 - (b) compaction procedures (Keppler Report, p. 9; NCR QFS 68, 120 and 130); and
 - (c) plant fill work (pp. 24 and 25, Keppler Report);
- XI. Test programs did not incorporate requirements and acceptance limits adequately in the areas referenced in a, b and c above, and do not meet these requirements regarding soil settlement remedial actions;
- XIII. Measures were not adequately established to prevent damage or deterioration of material regarding frost effects on compacted fill (pp. 16 and 17, Keppler Report);
- XV. Measures were not taken to control non-conforming material in order to prevent the inadvertent use (NCR QF 29 and QF 127).

250. Most of the items included in Contention 3(b) repeat the allegations in Appendix A to the Order (and thus Contention 3(a)). Contention 3(b) merely reclassifies them under different 10 CFR Part 50, Appendix B Quality Assurance Criteria. The Board finds that the substance of a deficiency, rather than its legal classification under criteria of Appendix B, is controlling. The items in Stamiris Contention 3(b) which were previously the subject of findings by the Board are hereby catalogued with cross references to the appropriate findings: Contention item 3(b)I has been discussed in paragraphs 240 to 245; Contention item 3(b)II has

been discussed in paragraph 246; Contention item 3(b)IX(a) (b) and (c) has been discussed in paragraph 248; Contention item 3(b)XIII has been discussed in paragraph 248; and Contention item 3(b)XI has been discussed in paragraph 247.

251. Four of the items were not specifically included in Appendix A of the Modification Order. These include item 3(b)VII which cites certain nonconformance reports (NCRs) apparently relating to soils testing written by the Consumers Power quality assurance department. The NCRs were not admitted into evidence, and thus are not before this Board. However, we note that the NRC requires the MPQAD to evaluate and close out all NCRs.^{583/} Mr. Gallagher testified that he is presently satisfied with Consumers Power's testing procedures.^{584/} Hence, Consumers Power has apparently taken appropriate corrective action. Items 3(b)IX(b) and 3(b)XI represent alleged deficiencies in soils placement, compact and testing. They cite NCRs as well. NCR No. 120 and NCR No. 130 relate to the use of incorrect "lift thicknesses" in soils placement. NCR No. 68 relates to the use of incorrect maximum dry density in soils placement standards.^{585/} The substance of these items were addressed in great detail in Consumers Power response to Question 23,

^{583/} Keeley, Tr. 1361.

^{584/} Gallagher, Tr. 2594.

^{585/} Stairis Exhibit No. 3, Attachment No. 7.

category 3, item 3.^{586/} No specific testimony concerning these items was taken. However, based upon the response to Question 23 and the NRC's finding that soils testing is now being conducted with appropriate procedures,^{587/} we find these matters have been resolved.^{588/}

(3) Past Soils Quality Assurance
Deficiencies and Management Attitude

252. Consumers Power has taken specific corrective action with regard to each deficiency listed in Appendix A of Modification Order. The NRC Staff, is, after thorough inspections, satisfied with the corrective actions taken.^{589/} However, the thrust of the contention is that these past soils deficiencies display a pattern of conduct by Consumers Power's management of failure to properly implement the quality assurance program. This pattern, it is alleged, presently demonstrates an attitude inconsistent with the principles of quality assurance as articulated in Appendix B to the NRC regulations 10 CFR Part 50. Consumers Power admits certain quality assurance deficiencies in connection with soils placement and compaction both in its response to 10 CFR §50.54(f), Question 23,^{590/} and has stipulated that it does not contest that these deficiencies constituted a

^{586/} Marguglio, prepared testimony, Attachment No. 10 at pp. 23-26, following Tr. 1501.

^{587/} Gallagher, Tr. 2594.

^{588/} Gallagher, Tr. 2594.

^{589/} Staff Exhibit No. 1, item (b) at p. 4.

^{590/} Marguglio, prepared testimony, Attachment No. 10, following Tr. 1501.

quality assurance breakdown in that area.^{591/} To the extent that these are admissions that quality assurance deficiencies contributed to the soils settlement problems at Midland, Consumers Power management must be held accountable. The question becomes what weight should such admissions have in our evaluation of the present Consumers Power management attitude toward quality assurance. In terms of this contention we must examine three areas: whether these deficiencies exhibit a pattern of improper conduct on the part of Consumers Power management; whether they constitute a failure on the part of Consumers Power management to keep quality assurance commitments; and whether they reflect in Consumers Power's present management an attitude inconsistent with proper quality assurance implementation.

(4) Pattern of Conduct

253. There is little evidence that an inappropriate management attitude perpetuated a "pattern of frequency" of improper quality assurance implementation as the contention alleges. Rather the evidence shows that the quality assurance deficiencies were isolated within the context of soils related activities.^{592/} Soils construction differs significantly from other types of construction work.^{593/} The

^{591/} Tr. 1172-75; NRC Staff/Consumers Power Company Quality Assurance Stipulation at pp. 1-2, following Tr. 1175.

^{592/} Marguglio, prepared testimony, Attachment No. 10, Parts 3 and 4, following Tr. 1501.

^{593/} Id. Part 3, at 23-15.

opportunities for inspection of soils placement, unlike other aspects of the project, are limited. Other construction activities, such as concrete or structural steel work, welding and other civil activities, permit a several stage verification of the adequacy of the work.^{594/} The results of soils placement work, however, in general are only inspected at the time of placement. After these initial acceptance tests, the only other quality assurance mechanism to verify adequacy is the long term monitoring program for settlement of structures supported by the fill.^{595/} Indeed, it is this very monitoring program which uncovered the settlement problem at the diesel generator building initially.^{596/}

254. NRC inspections in 1977 verified that the Consumers Power management's implementation of the quality assurance program at that time was adequate.^{597/} Director Keppler had an opportunity to review the impact of the soils quality assurance deficiencies in December 1978, after the initial NRC investigation into the soils problem was complete.^{598/} He concluded that they "did not represent a serious breakdown in quality assurance."^{599/}

^{594/} Marguglio, prepared testimony, Attachment No. 10, Part 3, at pp. 23-51, following Tr. 1501.

^{595/} Id.

^{596/} Keppler, Tr. 2048-49.

^{597/} Board Exhibit No. 1(a), at p. 10; Director Keppler notes soils placement was not evaluated during this inspection, Keppler, Tr. 2036.

^{598/} Consumers Power Exhibit No. 5, paragraph 2.

^{599/} Id.

255. After the NRC's second investigation into the soils quality assurance deficiencies in February, 1979 the Region III personnel met to review their impact on the Midland Project. The purpose of the meeting was to determine whether these deficiencies were isolated in nature or evidence of a broader problem.^{600/} It was their unanimous conclusion that Consumers Power's implementation of the quality assurance program was adequate and there was no overall quality assurance breakdown.^{601/} A similar meeting was held soon after at the NRC Headquarters in Washington, D.C.^{602/} Director Keppler and NRC personnel from the NRR Branch and legal branch of the NRC attended.^{603/} The conclusion of those present was that the soils problems were isolated and not indicative of a broader quality assurance problem.^{604/}

(5) Consumers Power Management Attitude as Reflected in the Response to the Soils Quality Assurance Deficiencies

256. Before the Modification Order was issued, Consumers Power management instituted a broad program to resolve the soils deficiencies. At the direction of Mr. Howell, a task force was immediately appointed to investigate the problem.^{605/} During the investigation he halted construc-

^{600/} Keppler, Tr. 1882-83.

^{601/} Id. Board Exhibit No. 1(a) at p. 10.

^{602/} Keppler, Tr. 1881-82.

^{603/} Id.

^{604/} Id.

^{605/} Howell, prepared testimony at pp.4-7, following Tr. 2802.

tion of the diesel generator building.^{606/} He authorized the retention of nationally recognized soil consultants, including Drs. Peck and Hendron, to assist in the investigation.^{607/} Further, he instigated the thorough investigation of soils quality assurance deficiencies. This culminated in November 1979 in the extensive quality assurance implementation reforms outlined in Consumers Power response to 10 CFR 50.54(f) Question 23.^{608/} The corrective action commitments in it went far beyond remedying the specific soils deficiencies.^{609/}

257. Although not directly prompted by soils matters,^{610/} the reorganization of the Midland Project Office^{611/} and quality assurance department^{612/} has specifically influenced the effectiveness of the company's response to the soils problems.^{613/} As a result of the reorganization, corporate management is directly linked to the quality assurance decision making process. Mr. Cook as head of the Project and has direct responsibility for the MFQAD. Thus he is advised

^{606/} Id. at p. 5.

^{607/} Id. at p. 6.

^{608/} Id. at p. 11; See also Marguglio, prepared testimony, Attachment No. 10, following Tr. 1501.

^{609/} Id.

^{610/} Howell, Tr. 2967-70.

^{611/} See infra pp. 21-26.

^{612/} See infra pp. 21-26.

^{613/} Cook, prepared testimony at pp. 3-5, following Tr. 1693.

of all quality assurance activities.^{614/} Several of the NRC Staff specifically lauded Mr. Cook as representing effective and responsible management control of Midland. Both Mr. Gallagher and Mr. Gilray testified that his appointment buttressed their reasonable assurance that management's attitude is consistent with the implementation of quality assurance regulations.^{615/}

(6) Deficiencies Identified in Recent NRC Inspections

258. In her Answer to Consumers Power's Interrogatories, April 20, 1981, Ms. Stamiris alleged additional quality assurance deficiencies which occurred during 1980-81 relating to soils settlement issues as demonstrating poor management attitude. She specifically identified NRC I&E Reports 80-32,^{616/} 81-01,^{617/} a "S.A.L.P" assessment of November 24, 1980^{618/} and "CPCo Report 18.4.3.6 and NRC 3401."^{619/} At the hearing questions were also raised concerning some noncompliances identified in NRC I&E Reports 79-10 and 79-11 relating to investigations conducted by Mr. Gallagher in 1979.

^{614/} Id. at pp. 8-9.

^{615/} Gallagher, Tr. 2333-35; Gilray, Tr. 3875-76.

^{616/} See infra pp. 50-51; Gallagher, NRC Staff prepared testimony in response to Stamiris Contention 3, Attachment No. 3, following Tr. 1754.

^{617/} See infra pp. 51-52; Gallagher, NRC Staff prepared testimony in response to Stamiris Contention 3, Attachment No. 4, following Tr. 1754.

^{618/} See infra p. 72.

^{619/} Stamiris Exhibit No. 2; this exhibit refers to an NCR No. 3041; we assume that the NCR 3041 and NCR 3401 are identical.

NRC Inspection 80-32

259. NRC Inspection Report 80-32^{620/} represents the NRC review of Consumers Power's implementation of the corrective action commitments in Consumers Power Response to NRC 10 CFR §50.54(f) Questions 1 and 23.^{621/} Two items of noncompliance, listing four quality assurance deficiencies, were identified. Mr. Gil ray, who took part in the inspection, described the deficiencies as insubstantial.^{622/} By October 1981, the NRC had verified that all of these items had been successfully corrected.^{623/}

260. The first item of noncompliance related to the FSAR re-review.^{624/} It dealt with an irregularity in the use of a procedure for completing "Block 8" in the re-review.^{625/} The FSAR re-review required that design documents and related matters in a particular area be reviewed for conflicts with the FSAR.^{626/} If a conflict was identified, in general the FSAR would be changed.^{627/} Block 8 was a space on the

^{620/} See infra pp. 50-51; Gallagher, NRC Staff prepared testimony in response to Stamiris Contention No. 3, Attachment No. 3, following Tr. at 1754.

^{621/} Infra pp. 50-51; infra pp. 28-35.

^{622/} Gilray, Tr. 3742-43.

^{623/} Landsman, Tr. 4851.

^{624/} See infra pp. 50-51; Gallagher, NRC Staff prepared testimony in response to Stamiris Contention No. 3, Attachment No. 3 and Attachment No. 4, Appendix A, following Tr. 1754.

^{625/} Id.

^{626/} Landsman, Tr. 4848-49.

^{627/} Landsman, Tr. 4852-54.

coversheet of the re-review form in which a reviewer was to list all reviewed documents.^{628/} To verify the accuracy of the re-review program, Consumers Power conducted three audits.^{629/} The first audit was completed after 600 sections of the FSAR were reviewed. The audit disclosed that some reviewers were using Block 8 to list only those documents which were inconsistent with the FSAR, not all of the documents they reviewed.^{630/} However, upon examination, the auditors found no instance in which a document which was inconsistent had been missed by a reviewer.^{631/} They determined that since the reviewers were aware of the purpose of the re-review -- the discovery of documents inconsistent with the FSAR^{632/} -- the irregularity did not threaten the accuracy of the effort.^{633/} The auditors decided that to attempt to correct the Block 8 irregularity at that time might create confusion.^{634/}

261. In December, 1979, Dr. Landsman examined the FSAR re-review program. Among other things he inspected the results of the audit.^{635/} He, however, disagreed with the

^{628/} Landsman, Tr. 4848-49.

^{629/} Landsman, Tr. 4848-51.

^{630/} Landsman, Tr. 4849; Consumers Power Exhibit No. 14.

^{631/} Landsman, Tr. 4849, 4930; Consumers Power Exhibit No. 14.

^{632/} Landsman, Tr. 4851.

^{633/} Consumers Power Exhibit No. 14.

^{634/} Id.

^{635/} Landsman, Tr. 4849.

auditors' decision not to correct the Block 8 irregularity.^{636/} Accordingly, Dr. Landsman issued a noncompliance with respect to the lack of corrective action for the Block 8 procedure.^{637/}

262. Before Dr. Landsman's inspection in December, Consumers Power initiated a second audit of the next 300 completed sections of the FSAR re-review.^{638/} To increase their confidence in the accuracy of the re-review, the second audit used a larger statistical sample than the first.^{639/} In addition, in cases where the auditors discovered evidence of the Block 8 irregularity, the section was one of those submitted to a second tier technical re-examination of all related documents to verify that all documents conflicting with the FSAR were found.^{640/} This second tier review examined 100% of those sections; in no instance had an inconsistent document been overlooked.^{641/}

263. After this second audit, in response to Dr. Landsman's noncompliance, Consumers Power distributed a memorandum to all personnel re-emphasizing the proper Block 8 procedures.^{642/} In a third audit, Consumers Power conducted another complete

^{636/} Id.

^{637/} Id.

^{638/} Landsman, Tr. 4861; 4850.

^{639/} Id.

^{640/} Landsman, Tr. 4850; 4878-79.

^{641/} Id.

^{642/} Landsman, Tr. 4850.

re-evaluation of the re-review already done on the final 100 packages of the FSAR. This determined that all re-reviewers had filled out Block 8 properly.^{643/} Based upon the audits, the corrective action memorandum and his own independent inspection of the review,^{644/} Dr. Landsman ascertained that the Block 8 matter had been appropriately resolved.^{645/} He verified that the FSAR re-review was adequate.^{646/}

264. According to Dr. Landsman the deficiency with respect to Block 8 has no bearing upon management attitude.^{647/} The decision not to take further corrective action on the Block 8 matter was made by the lead auditor, who is not a part of Consumers Power management.^{648/} Dr. Landsman, although disagreeing with the decision, determined that the auditor had a good attitude.^{649/} In addition, Dr. Landsman identified nothing to suggest that cost or time considerations had an effect on the auditor's choice not to proceed with the corrective action initially.^{650/}

265. The second noncompliance involved three items. The first of these dealt with a requirement that a log be

^{643/} Landsman, Tr. 4850-51.

^{644/} Landsman, Tr. 4863.

^{645/} Landsman, Tr. 4851.

^{646/} Landsman, Tr. 4930.

^{647/} Landsman, Tr. 5074-75.

^{648/} Landsman, Tr. 5075.

^{649/} Id.

^{650/} Id.

maintained to reflect the interface between design organizations.^{651/} Dr. Landsman determined that a specification interface log in the possession of a Bechtel employee was not being properly maintained.^{652/}

266. In October 1981, Dr. Landsman determined that Consumers Power had followed all necessary procedures regarding the log since his December 1980 inspection.^{653/} Consumers Power was also in the process of revising the log to include a record of specification-related documents developed prior to November 1980.^{654/}

267. The other two items relate to the ambiguities in engineering department instructions.^{655/} The instructions were rewritten and the NRC verified their adequacy in their May 1981 inspections.^{656/}

NRC Inspection Report 81-01/
Audit Finding "18.4.3.6"

268. The January 1981 inspection, 81-01, identified three items of noncompliance and one deviation.^{657/} Two

^{651/} See infra pp. 50-51; Gallagher, NRC Staff prepared testimony in response to Stamiris Contention No. 3, Attachment No. 3, Appendix A, item 2(a), following Tr. 1754.

^{652/} Landsman, Tr. 4984.

^{653/} Id.; Landsman, Tr. 4986-88.

^{654/} Landsman, Tr. 4986-88.

^{655/} See infra pp. 50-51; Gallagher, NRC Staff prepared testimony in response to Stamiris Contention No. 3, Attachment 3, Appendix A, at p. 2, items b and c, following Tr. 1754.

^{656/} Staff Exhibit No. 1 at p. 6; Landsman, Tr. 4991.

^{657/} Gallagher, NRC Staff prepared testimony in Response to Stamiris Contention No. 3, Attachment No. 4, Appendix 4 and B following Tr. 1754.

of the noncompliances were withdrawn by the NRC as being incorrectly identified as deficiencies. The first related to control of test forms for soils testing.^{658/} The second related to the onsite geotechnical engineer's use of a rubber stamp to validate documents, instead of initialling them by hand.^{659/} Mr. Gallagher suspected that the rubber stamp was being used on occasions where the geotechnical engineer had not personally reviewed a document.^{660/} His later investigation revealed, however, that the stamp had in fact been in the sole possession of the geotechnical engineer.^{661/} His concern eliminated, Mr. Gallagher withdrew the deficiency.^{662/} Consumers Power agreed not to use the rubber stamp in the future.^{663/}

269. The third deficiency concerned soil testing procedures used by the U.S. Testing Company. Mr. Gallagher stated these and the audit findings (NRC 18.4.3.6) and non-conformances report (NCR 3041)^{664/} were not a repetition of past soils problems.^{665/} Gallagher is now satisfied with

^{658/} Gallagher, Tr. 2367.

^{659/} Gallagher, Tr. 2366-7; Gallagher, NRC staff prepared testimony in response to Stamiris Contention No. 3, Attachment No. 4, following Tr. 1754.

^{660/} Gallagher, Tr. 2367-68.

^{661/} Gallagher, Tr. 2368-70.

^{662/} Gallagher, Tr. 2368.

^{663/} Gallagher, Tr. 2370.

^{664/} Stamiris Exhibit No. 2.

^{665/} Gallagher, Tr. 2448.

Consumers Power's and U.S. Testing's soils testing procedures.^{666/}

270. The deviation cited related to the qualifications of the onsite geotechnical soils engineer. Initially, in April 1979, the NRC accepted as adequately qualified a particular geotechnical engineer.^{667/} In December 1980, that engineer left the job and was replaced. In January 1981, the NRC's inspector questioned the second engineer's qualifications.^{668/} Soon after this, the second engineer was replaced by someone whose qualifications satisfied the NRC.^{669/}

SALP Appraisal

271. As noted earlier, SALP appraisals ("Systematic Appraisal of Licensee Performance")^{670/} are a method by which the NRC evaluates the overall performance of a licensee.^{671/} As a necessary incident of the appraisal, the report lists deficiencies which occurred during the appraisal period. Such deficiencies are included in the SALP appraisal for Midland, covering the period July 1, 1979 to June 30, 1980.^{672/}

^{666/} Gallagher, Tr. 2594.

^{667/} Gallagher, Tr. 1836.

^{668/} Id.

^{669/} Keeley, Tr. 1396-1400.

^{670/} See infra p. 72.

^{671/} NRC Staff prepared testimony in response to Stamiris Contention No. 1, pp. 11-13, following Tr. 1560.

^{672/} Consumers Power Exhibit No. 6.

272. The SALP report for Midland concludes that as to quality assurance implementation "the performance at Midland Units 1 and 2 was considered to be adequate."^{673/} This conclusion was the opinion of all the NRC personnel who took part in the appraisal, including Mr. Gallagher and Director Keppler.^{674/} None of the deficiencies in the report relate directly to soils settlement issues. There has been no direct evidence linking any of them to the soils issue. The two most significant items relate to the inadequacy of the quality program of the Zack Company, a subcontractor, and a problem with the pressure vessel anchor bolts.^{675/} Both of these were characterized by the Staff as isolated problems of quality assurance implementation and not an inadequate quality assurance program or a breakdown in implementation.

273. The first problem involved quality deficiencies by the Zack Co., a heating, ventilating and air conditioning (HVAC) sub-contractor.^{676/} Mr. Marguglio, from Consumers Power, testified to both issues. He stated that in viewing Zack nonconformance reports Consumers Power and Bechtel identified a problem with the welding workmanship.^{677/} A "management corrective action" request (MCAR) was issued in

^{673/} Id.; Keppler, Tr. 2037.

^{674/} Keppler, Tr. 2038.

^{675/} Consumers Power Exhibit No. 6.

^{676/} Keppler, Tr. 2049-50; Consumers Power Exhibit No. 2; Marguglio, Tr. 1650.

^{677/} Marguglio, Tr. 1643-44, 1657.

January, 1980 because Consumers Power was dissatisfied with the length of time it took to resolve the problem.^{678/} The NRC was sent all nonconformance reports on the matter.^{679/} Mr. Ron Cook, the resident NRC Inspector at Midland, was informed of the Zack problem.^{680/} All Zack management personnel at the site, at the request of Consumers Power, had been replaced.^{681/} Consumers Power had instituted a 100% overinspection program of Zack work.^{682/} In March 1980, a second problem involving procedures was identified by a Zack quality control inspector. He reported the matter to the NRC.^{683/} He did not inform either Consumers Power or Bechtel about the problem.^{684/} Since his job is to discover and report noncomplying work, he was privy to information not available to Consumers Power.^{685/} It is this second Zack occurrence which resulted in NRC action.^{686/} Ultimately, Consumers Power took over all quality control and quality assurance functions of Zack's HVAC work to assure the final

^{678/} Marguglio, Tr. 1644-45; Consumers Power Exhibit Nos. 2 and 3.

^{679/} Marguglio, Tr. 1646.

^{680/} Id.

^{681/} Keppler, Tr. 2051.

^{682/} Keppler, Tr. 2049-50, 2056.

^{683/} Marguglio, Tr. 1481; Keppler, Tr. 2050.

^{684/} Marguglio, Tr. 1446.

^{685/} Keppler, Tr. 2051-51.

^{686/} Marguglio, Tr. 1482-83.

quality of the workmanship and compliance with procedures.^{687/}

274. Another non-soils related deficiency mentioned in SALP is the failure in 1979 of reactor vessel anchor bolts. The bolts failed sometime after their installation because of improper fabrication.^{688/} Prior to the failure, the bolts had given no indication of improper fabrication.^{689/} Mr. Marguglio testified that detection deficiencies arising from supplier fabrication problems are not within the ambit of the trend analysis system.^{690/} Trend analysis is designed to pick up repeated nonconformance or patterns of nonconformances at the site.^{691/} Off-site problems are not trended within the system.^{692/} At the time of the fabrication of the anchor bolts in 1975, neither NRC regulations nor industry standards required Consumers Power to perform a trend analysis on a supplier's fabrication processes.^{693/} Hence, there was no prior warning of the problem, and the adequacy of the trend program was not called into question.

^{687/} Marguglio, Tr. 1650.

^{688/} Keppler, Tr. 1965, 2039.

^{689/} Keppler, Tr. 2039.

^{690/} Marguglio, Tr. 1435-36; 1449-1450.

^{691/} Marguglio, Tr. 1658.

^{692/} Id.

^{693/} Marguglio, Tr. 1524.

NRC Inspection Reports 79-10, 79-19

275. NRC Inspection Report 79-10 covered an inspection conducted in May 1979.^{694/} In the report Mr. Gallagher, one of the inspectors, indicates a dissatisfaction with the ANSI qualifications of quality control personnel in the area of containment post-tensioning.^{695/} He did not issue a non-compliance concerning the matter. ANSI, the American National Standards Institute, comprises committees which represent experts in particular engineering areas.^{696/} The committees set industry-wide standards for a particular discipline.^{697/} Mr. Gallagher is not a member of any ANSI Committee.^{698/} Mr. Gallagher testified that, in the technical judgment of Consumers Power, the post-tensioning inspectors were qualified under applicable ANSI standards, but that he disagreed with this analysis.^{699/} In September 1979 Consumers Power management and Mr. Gallagher met to resolve this difference.^{700/} The NRC is now satisfied with the inspector's qualifications.^{701/}

^{694/} Gallagher, Tr. 2427-28.

^{695/} Id.; Stamiris Exhibit No. 3, Attachment No. 10.

^{696/} Gallagher, Tr. 2458.

^{697/} Id.

^{698/} Id.

^{699/} Gallagher, Tr. 2460.

^{700/} Gallagher, Tr. 2428.

^{701/} Gallagher, Tr. 2428.

276. The question of quality control inspector qualifications also arose in the context of the planned remedial work on soils.^{702/} Mr. Gallagher expressed the view that Consumers Power, as well as other nuclear construction permit holders, have misused an exception in an ANSI standard (ANSI N.45.2.6).^{703/} He opposes the exception in the standard which permits the substitution of certain educational or experiential requirements for inspectors if an equivalent level of competence can be demonstrated.^{704/} In Mr. Gallagher's opinion, the debate over qualification of quality assurance personnel is "the biggest problem facing our industry today."^{705/} It was not peculiar to the Midland site, but endemic to the industry.^{706/} Mr. Cordell Williams, the chief inspector for Region III in the civil area,^{707/} disagrees with Mr. Gallagher's assessment of the ANSI waiver provision.^{708/} He believes the flexibility it provides is necessary.^{709/}

^{702/} Gallagher, Tr. 2432.

^{703/} Id.; Gallagher, Tr. 2460.

^{704/} Gallagher, Tr. 2432.

^{705/} Gallagher, Tr. 2433.

^{706/} Gallagher, Tr. 2433.

^{707/} Williams, Tr. 2197-98.

^{708/} Williams, Tr. 2207.

^{709/} Id.

277. According to Mr. Marguglio, the Midland quality control and quality assurance inspectors are well qualified.^{710/} For example, as a part of the recent improvements in the MPQAD quality assurance program, quality control inspectors are required to be certified on particular inspection plans, a requirement in excess of ANSI standards.^{711/} John Gilray, from the NRC Staff, cited these upgraded qualifications in his affirmative assessment of Midland's quality assurance program.^{712/} In the recent MAC audit, qualifications of both Bechtel and Consumers Power inspectors were reviewed.^{713/} The auditors found the inspectors properly qualified for the tasks to which they are certified.^{714/}

278. Mr. Williams testified that the number of persons presently on the Midland civil quality assurance staff is adequate.^{715/} However, for some of the planned remedial work, differently qualified personnel may be necessary.^{716/} Consumers Power is aware of this and has pledged to acquire such persons as a condition precedent to the remedial work.^{717/}

^{710/} Marguglio, Tr. 1529.

^{711/} Marguglio, prepared testimony at p. 32, following Tr. 1424.

^{712/} Gilray, Tr. 3713.

^{713/} Staff Exhibit No. 4, at p. 10.

^{714/} Id.

^{715/} Williams, Tr. 2216.

^{716/} Id.

^{717/} Marguglio, Tr. 1529.

Both Mr. Gallagher and Mr. Williams testified that the NRC will make certain that sufficient nubmers of qualified personnel are present onsite before approving the start of the remedial work.^{718/} The record shows that Mr. Cook, the Midland Project Office Vice President, has always been responsive to the requests for personnel by the quality assurance department. He himself could not recall any request for personnel by "Mr. Marguglio or Mr. Bird he has turned down."^{719/}

279. The 1979 NRC inspections also addressed the Consumers Power practice of using non-safety grade concrete as a substitute for plant fill material. Lean concrete us^r in plant fill had not been classified as Category I (i.e. safety-related) material.^{720/} During the course of discussions with the NRC Staff on this subject, a Bechtel design engineer was consulted who expressed the opinion that, because of the properties of concrete and its strength, it was not necessary to use safety-grade concrete in plant fill.^{721/} Mr. Gallagher disagreed but admitted that this constituted a technical and regulatory difference in judgment between him and Consumers Power.^{722/} The basis for the

^{718/} Gallagher, Tr. 2427; Williams, Tr. 2220-21.

^{719/} Cook, Tr. 2514-15.

^{720/} Gallagher, Tr. 2430.

^{721/} Gallagher, Tr. 2461.

^{722/} Gallagher, Tr. 2461.

technical disagreement was not explored at the hearing. However, we note that Consumers Power has agreed to reclassify concrete to Category I.^{723/}

Past Commitments and Management Attitude

280. Contentions 3(a) and 3(b) also allege that the past soils quality assurance deficiencies demonstrate a failure on the part of Consumers Power management to keep their promises concerning improvements in quality assurance implementation. In Appeal Board decision ALAB-106 certain reporting requirements concerning quality assurance matters were required of Consumers Power.^{724/} Specifically, Consumers Power was to periodically file all nonconformance reports with the NRC.^{725/} Consumers Power kept that commitment.^{726/} In 1974, the AEC (NRC) held a show cause hearing concerning quality assurance problems at Midland involving cadwelding.^{727/} At the hearing Consumers Power made commitments to insure that the Project would continue to be built with reasonable assurance to public health and safety.^{728/} These involved taking corrective action in terms of specific cadwelding

^{723/} Consumers Power Exhibit No. 6.

^{724/} In the Matter of Consumers Power Company (Midland Plant, Units 1 and 2) 6 AEC 182 (1973).

^{725/} Keppler Tr. 2026-27.

^{726/} Id.

^{727/} In the Matter of Consumers Power Company (Midland Plant, Units 2 and 2), 8 AEC 584 (1974).

^{728/} Howell, Tr. 2807-08.

problems.^{729/} In addition, more generalized investigations were to be conducted to identify any generic implications the cadwelding problems might have.^{730/} Finally, actions were to be taken to assure that any potential problems which were identified were forestalled.^{731/} Among other things, Consumers Power hired an outside consultant to perform bi-annual audits of the implementation of the quality assurance program.^{732/} Mr. Howell stated that Consumers Power management have kept these commitments since 1974.^{733/} Although quality assurance problems have occurred, such as the soils problems, he asserted that "the general program has been successful in accomplishing the overall goals."^{734/}

281. Director Keppler testified during the 1974 cadwelding hearing.^{735/} He recalled that the hearing considered two questions. The first related to whether Consumers Power had remedied the particular problem in question.^{736/} The second related to whether there was "reasonable assurance that the Company would continue with compliance."^{737/} In

^{729/} Howell, Tr. 2808.

^{730/} Id.

^{731/} Id.

^{732/} Id.

^{733/} Howell, Tr. 2807.

^{734/} Id.

^{735/} Keppler, Tr. 1918, 2074-75.

^{736/} Keppler, Tr. 1918.

^{737/} Id.

1974, Director Keppler testified he noted a change "in the Company's attitude both with their operating plant and with their construction project."^{738/} In this hearing, he noted no such substantial change in management attitude because Consumers Power management attitude toward quality assurance at Midland has been consistently good:

"My view of the Midland construction project is that while there have been some areas that have given me heartburn, that have caused me to require work be halted in certain areas and clear problems that should not have happened, I had felt that the Company's attitude on Midland and the Company's commitments that they made at the 1974 hearing have basically been intact. They have been strengthened, by the recent reorganization, the one a year ago, because I clearly see more of the togetherness in trying to solve the problems at the site." (Emphasis added)^{739/}

(8) Board's Findings Relating to Contentions 3(a) and 3(b) Assurance Deficiency Allegations

282. Based on the evidence we reject the factual premise underlying Contention 3(a) and 3(b) relating to quality assurance deficiencies. The premise of the contention is that the soils quality assurance deficiencies in and of themselves reflect a poor management attitude. The evidence does not support this assumption. Similarly, we cannot agree that such quality assurance deficiencies are inevitable in a large construction project or that since

^{738/} Id.

^{739/} Keppler, Tr. 1918; see also 2022.

they have been resolved they are irrelevant to the success of the project in the future. Instead, we have attempted to evaluate the soils quality deficiencies in past deficiencies at the Project, management's quality assurance commitments and the present management's performance.

283. First, we could not identify a "pattern of frequency" of poor quality assurance implementation. The NRC Staff's testimony is consistent on this point: there was never an overall failure in the implementation of the quality assurance. The soils quality assurance deficiencies were the sole significant shortcoming from 1975 to the present. And, this shortcoming did not extend to all aspects of the quality assurance program implementation with respect to soil placement. The quality assurance program did identify the soils problem.

284. Second, Consumers Power management's response to soils problem was direct and inclusive and consistent with past quality assurance commitments. If our evaluation considers past quality assurance implementation failures, we must also take into account the positive steps Consumers Power management has taken to remedy the soils quality assurance deficiencies. Here, it is not necessary for us to rely on a management promise to improve implementation. We have heard extensive evidence of the actual improvement taken.

285. Contrary to the contention's premise, the evidence shows Consumers Power Management has kept past quality

assurance commitments. Upon discovery of the excess soils settlement Consumers Power management directed a series of far-ranging corrective actions. Consumers Power's response to 10 CFR §50.54(f), Question 1 and 23, document these actions. Concurrently, a major reorganization of the Project management and the quality assurance departments occurred which helped insure the success of the corrective actions. Although not prompted by the soils problem itself, these reorganizations provide the Project with a strong, responsible management within Consumers Power corporate structure with direct control over the Project. We note that each of the NRC staff members who spoke of James Cook cited his participation in the Project as a reason for their confidence in its success. We ourselves had the opportunity to hear and evaluate Mr. Cook through his testimony and we agree with the Staff's estimate.

286. Finally, we find that the recent NRC Inspections show just how effectively Consumers Power's management, through the MPQAD, is now implementing the quality assurance program. As the NRC acknowledged, no matter what plant you inspect, deficiencies will be identified. But, as Director Keppler emphasized, the deficiencies identified at Midland in the past two years have not been significant.

287. The other deficiencies identified by the NRC inspectors were notable for the absence of the type of actual construction errors -- such as the improper soils placement -- which led to the soils settlement problems.

They fell into categories of procedural irregularities or technical disputes between the NRC Staff and Consumers Power. For example, the FSAR re-review Block 8 procedural irregularity did not actually threaten the substance of the re-review. The audits carefully assured that the actual re-review was accurate. The deficiencies related to the qualifications of quality control personnel and the geo-technical engineer or the use of concrete must be similarly viewed. These were technical controversies between the NRC Staff and Consumers Power. Even in the Zack incident referred to in the SALP appraisal, Consumers Power management took significant actions to remedy the problem before the NRC Staff became involved. In light of this record, we find that there has not been a pattern of quality assurance deficiencies reflecting poor management attitude. Consumers Power management has kept its commitments to the NRC and the public in the past. Their performance subsequent to the identification of the soils settlement problem gives us confidence that they will continue to keep such commitments in the future.

Stamiris Contention 3(c)

Consumers Power Company has not implemented its Quality Assurance Program regarding soil settlement issues according to 10 CFR Part 50, Appendix B regulations, and this represents a repeated pattern of quality assurance deficiency reflecting a managerial attitude inconsistent with implementation of Quality Assurance Regulations with respect to soil settlement problems, since reasonable assurance was given in past cases (ALAB 100, ALAB 107 and LBP 74-71) that proper quality assurance would ensue and it has not.

The Quality Assurance deficiencies regarding soil settlement include:

- (c) the settlement of the Administration Building in 1977 should have served as a quality indicator, preventing the same inadequate procedures from occurring in the 1978 construction of the diesel generator building, causing its eventual settlement.

288. This contention alleges that the information from the investigation of the Administration Building grade beam settlement should have prevented the diesel generator building settlement. In her answers to Consumers Power's Interrogatories filed in April 1981, Ms. Stamiris altered the thrust of the contention. Upon learning that the fill for the diesel generator building had already been placed at the time of the grade beam settlement, she contended:

the settlement of the Administration Building footings in 3/77 should have prevented the commencement of the DGB in October 1977 (first pour). Diesel generator building construction should not have been started until all soil-related questions were resolved

She added that the grade beam investigation was not complete in October 1977 and that when complete, it was lacking in "root cause analyses or generic implications."

289. The Administration Building grade beam settlement was extensively discussed in Contention 1.^{740/} We will briefly summarize the investigation here. The Administration Building is a non-safety related structure.^{741/} The soils

^{740/} Infra, pp. 91-98.

^{741/} Keeley, Tr. 1315; Gallagher, Tr. 2356.

under the several grade beams had been re-excavated and replaced in conjunction with the installation of a steam tunnel within the Administration Building.^{742/} One grade beam exhibited excessive settlement. Bechtel investigated the cause of the problem. The purpose of the investigation was to determine whether the problem was localized or whether it extended to other areas of the site.^{743/} The grade beams adjacent to the failed beam were load tested. They did not exhibit settlement.^{744/} Seven soils borings were taken to examine the quality of the supporting plant fill.^{745/} Two of them were taken outside the area of the Administration Building -- one at the site of the diesel generator building.^{746/} These borings indicated that the placement of fill in other areas was adequate.^{747/} No other structures on the site at that time exhibited settlement.^{748/}

290. The investigation found that the cause of the problem was localized.^{749/} The grade beam settled because

^{742/} Keeley, prepared testimony at p. 5, following Tr. 1163; Kane, Tr. 4300; Gallagher, Tr. 2534.

^{743/} Keeley, prepared testimony at p. 5, following Tr. 1163; Keeley, Tr. 1200; Gallagher, Tr. 2561.

^{744/} Keeley, prepared testimony at p. 5, following Tr. 1163; Gallagher, Tr. 2592.

^{745/} Gallagher Tr. 2556.

^{746/} Keeley, prepared testimony at p. 5, following Tr. 1163; Gallagher, Tr. 2556, 2591-92.

^{747/} Id.

^{748/} Gallagher, Tr. 2556.

^{749/} Keeley, prepared testimony at p. 5, following Tr. 1163.

U.S. Testing Company failed to properly test the re-excavated soils at the beam when the steam tunnel was installed.^{750/} Although the final report of the investigation was issued in December 1977, its results were known before the construction of the diesel generator building began in October 1977.^{751/} U.S. Testing personnel were informed of the problems and retrained in soils testing procedures.^{752/}

290. The NRC Staff, in hindsight, was not in agreement as to whether the grade beam investigation was adequate. Eugene Gallagher agreed with Contention 3(c) that it was not. He testified that the involvement of U. S. Testing in soils testing at both the Administration Building and the diesel generator building should have been enough to warn Consumers Power that a plant-wide problem existed.^{753/} Further, Mr. Gallagher believed that more soils borings should have been taken.^{754/} Mr. Joseph Kane, of the NRC's technical staff, however, testified that the unique re-excavation and re-fill under the grade beams could indicate that the problems was localized.^{755/} He stated that only if there were "any pieces of information known at that time

^{750/} Keeley, Tr. 1358-59; 1197-98.

^{751/} Keeley, Tr. 1312.

^{752/} Keeley, Tr. 1198.

^{753/} Gallagher, Tr. 1273-74.

^{754/} Gallagher, Tr. 2568-70.

^{755/} Kane, Tr. 4300-06.

which would indicate that it could possibly be in the entire plant fill," would he change his judgment.^{756/}

291. We find that Contention 3(c) is incorrect in its suggestion that the Administration Building grade beam failure investigation was inadequate. We cannot accept its premise that the diesel generator building was begun without knowledge of the results of the investigation or until all soils related questions were resolved. Finally, we disagree with its implication that Consumers Power management somehow imprudently permitted either the inadequate investigation or the construction of the diesel generator building.

292. The scope of the grade beam investigation was sufficient. The evidence shows it concentrated on the causes of the grade beam failure -- soils placement and testing. It considered the plant-wide implications of the causes it identified. It is clear, even in hindsight, that there was no myopic concentration of the investigation on grade beams alone. Borings were taken at other places around the site -- including the diesel generator building. The purpose was to test the soils to determine if the testing errors pervaded beyond the steam tunnel re-excavation. The borings showed they had not. While it is evident today that the soils problem was widespread, we have no evidence to show that the results of those particular borings were incorrect or skewed.

^{756/} Kane, Tr. 4301.

293. The conclusion of the investigation likewise was not incautious. We agree with Mr. Kane that the context of the unique soils placement situation at the grade beams is significant. The lack of settlement on adjacent grade beams, the results of the borings program and the lack of settlement on other plant structures, give strong evidence that the soils placement problem was localized. If there had not been a unique re-excavation, re-soils placement; if one of the outside borings showed poor soils; if another site structure had exhibited settlement: then there might have been a suggestion of a broader, plant-wide problem. None of these were true in October 1977. As Mr. Kane noted -- unless there was something more -- even in hindsight it was possible and reasonable to conclude that the problem was localized.

294. There is no indication that Consumers power management somehow rashly pushed ahead with the diesel generator building construction without the investigation results. Mr. Keeley stated that the results of the investigation were known before the construction began. There is no evidence that if the actual extent of the problem had been determined after construction of the diesel generator building began Consumers Power would not have stopped and taken remedial actions. On the contrary, when the soils problem at the diesel generator building became evident in 1978, that is exactly what occurred. There is no evidence that Consumers Power management attitude somehow led to inadequate investigation.

(10) Stamiris Response to Interrogatory 3A

Consumers Power Company has not assumed its responsibility in overseeing Quality Assurance effectiveness, as set forth in 10 CFR 50, Appendix B, I, or in avoiding undue cost/schedule influence, as set forth in Appendix B, I and SRP regulations. Applicant's admissions on response to 50-54(f) question 23(1) support the Ei examples.

295. In this interrogatory response, Ms. Stamiris alleges that Consumers Power management failed to control the quality assurance program. The bases for this failure, she contends, are cost/schedule influences.

296. The NRC Staff was unwavering in its conclusion that the organization of the quality assurance department is and has been effective.^{757/} Mr. Gilray testified that the quality assurance program at Midland has always met regulatory requirements.^{758/} This would include the quality assurance requirement pertaining to 10 CFR Part 50, Appendix B, Criterion I -- Organization. There is no evidence that Consumers Power Company's quality assurance program fails to meet SRP (Standard Review Plan) guidelines.^{759/}

297. There is no evidence that cost and schedule considerations somehow relate to the quality assurance program, its implementation or any of the deficiencies identified in its response to 10 CFR §50.54(f) Question 23.

^{757/} Keppler, Tr. 2054.

^{758/} Gilray, prepared testimony at 2, following Tr. 3718.

^{759/} We note that SRP guidelines are not formal NRC regulations.

According to Director Keppler Consumers Power discussed all aspects of the MPQAD organizational structure, including Mr. Cook's dual cost/schedule and quality assurance responsibilities, with the NRC Staff before the MPQAD was formed. They found that the dual responsibilities of Cook presented no conflict with 10 CFR Part 50, Appendix B, Criterion I.^{760/} Mr. Gallagher stated that he was not aware of any instance where time or financial pressure affected management's decisions on soils matters.^{761/}

298. On the basis of our findings above, we firmly believe that the management of Consumers Power can, and will, exercise full control over the quality assurance aspects of the project.

Management Attitude Contentions 1, 2 and 3

299. The expression "inattention to detail" was used by Gilbert Keeley to describe one of the causes of the soils problems. It was cited by Mr. Gallagher as a reflection upon Consumers Power management's "pre-December 6, 1979 attitude." The identified deficiencies may be representative of that problem. However, Mr. Gallagher's conclusion must be limited by his, and the NRC's, Staff judgment that there was no broad breakdown in quality assurance at the Midland site, even when the soils-related deficiencies were occurring. Consumers Power has admitted to quality assurance

^{760/} Keppler, Tr. 2054.

^{761/} Gallagher, Tr. 2541-42.

deficiencies, and we believe has taken adequate steps in response to them. Those steps were initiated by Mr. Howell and carried on by Mr. Cook. There has been no showing that Consumers Power management has attempted to hide or camouflage problems. Neither has there been evidence that the cost or schedule considerations improperly influenced the resolution of soils problems. It is the unanimous testimony of all witnesses who expressed an opinion on the subject that present management attitude is consistent with the implementation of quality assurance regulations. Even those witnesses most critical of past management attitude have so testified. The Board agrees, and finds that Consumers Power management attitude is consistent with a finding of reasonable assurance in public health and safety with regard to quality assurance.

CONCLUSIONS OF LAW

The Licensing Board has reviewed the proposed findings of fact and conclusions of law submitted by the parties, and based on the preponderance of the reliable, probative and substantial evidence of the record in this proceeding and the foregoing findings of fact related to Consumers Power Company's quality assurance program and managerial attitude, the Board concludes:

- a. That the soils-related quality assurance deficiencies set forth in Appendix B of the "Order Modifying Construction Permits" were an adequate basis for the issuance of the Order;
- b. Consumers Power Company's quality assurance program complies with the quality assurance requirements set forth in 10 CFR Part 50, Appendix B;
- c. Consumers Power Company is currently implementing its quality assurance program in compliance with the Commission regulations;
- d. Consumer Power Company's management understands and accepts its responsibilities to ensure proper implementation of quality assurance during the remainder of the construction activities at the Midland site and has taken effective measures to carry out this responsibility;

e. There is reasonable assurance that proper implementation of quality assurance requirements will continue throughout the remedial work associated with the soils settlement matters and throughout the balance of the construction process at the Midland site;

f. Consumers Power Management has the technical competence and commitment to provide reasonable assurance that the remedial measures it has chosen in order to resolve the soils settlement problems are being, and will continue to be, properly implemented;

g. That the "Order Modifying Construction Permits," dated December 6, 1979, issued by the offices of Nuclear Reactor Regulation and Inspection and Enforcement, should not be sustained on the basis of the quality assurance deficiencies noted in the Order.

ORDER

In accordance with the Atomic Energy Act, as amended, and 10 CFR §§2.762, 2.764, 2.785 and 2.786, it is hereby ORDERED:

1. that the "Order Modifying Construction Permits," dated December 6, 1979, will be vacated to the extent it was based on quality assurance deficiencies and suspended quality assurance-related construction activities under Construction Permits Nos. CPPR-81 and CPPR-82, and

2. that Construction Permit Nos. CPPR-81 and CPPR-82, issued to Consumers Power Company for the Midland Plant, Units 1 and 2, will not be suspended, modified, amended or revoked on the basis of quality assurance deficiencies, the subject, in part, of the "Order Modifying Construction Permits," dated December 6, 1979.

It is further ORDERED that this partial decision shall be effective immediately and shall constitute the final action and resolution of the Commission on the issues of quality assurance and managerial attitude forty-five (45) days after issuance thereof, subject to any renewal pursuant to the above-cited Rules of Practice.

Within ten (10) days after service of this partial initial decision, any party may take an appeal to the Commission by the filing of exception to this decision or designated parts thereof. A brief in support of the exceptions should be filed within thirty (30) days thereafter [forty (40) days in the case of the Staff]. Within (30) days of the filing and service of the brief [forty (40) days in the case of the Staff], any party may file a brief in support of, or in opposition to, the exceptions.

THE ATOMIC SAFETY AND
LICENSING BOARD

Charles Bechhoefer, Chairman
Administrative Judge

Frederick P. Cowan
Administrative Judge

Ralph S. Decker
Administrative Judge

APPENDIX A

EXHIBIT INDEX

A. Licensing Board

Exhibit #1(a): 2/15/79 Memo from Keppler to Thornburg,
re: Midland Summary Report.

Exhibit #1(b): 10/18/79 Memo from Fiorelle, re: Midland
Construction Status as of 10/1/79.

Exhibit #1(c): 3/15/79 letter from Keppler to Howell,
re: meetings of 2/23/79 and 3/5/79 (NRC preliminary
investigation findings and CPCo responses).

Exhibit #1(d): 3/12/79 Memo from Keppler to Thornburg,
re: 2/23/79 and 3/5/79 meetings between NRC, CPCo,
and Bechtel.

Exhibit #2: Three pages including letter transmitting
PSAR amendment No. 3 (Dames & Moore report) to NRC
and letter transmitting report to Bechtel. (First
three pages to Stamiris Exhibit #5.)

B. Consumers Power

Exhibit #1: Tabulation of QA, QC and manual personnel
on site between 12/75 and 7/81.

Exhibit #2: 1/12/81 letter from Keppler to Cook,
transmitting I.E. Inspection Reports 50-329/80-10
and 50-330/80-11 regarding Zack (HVAC) allegations.

Exhibit #3: 1/30/81 letter from Cook to Stello,
transmitting CPCo response to items of non-compli-
ance regarding Zack (HVAC).

Exhibit #4: 11/20/78, letter from Cherry to Keppler,
regarding CPCo withholding of information from
the NRC and allegations involving the resident
inspector.

Exhibit #5: 12/14/78 letter from Keppler to Cherry,
responding to 11/20/78 letter (with attachments).

Exhibit #6: 12/18/80 letter from Keppler to Cook,
transmitting I.E. Inspection Reports No. 50-329/80-35
and 50-330/80-36, regarding SALP.

Exhibit #7: 8/24/79 Memo from Hood to File, regarding 8/16/79 internal meeting on status of Midland Soils Settlement.

Exhibit #8: Draft Notes (typed), titled "Trend Analysis," by D.M. Turnbull.

Exhibit #9: Four pages, titled "Discussion Copy, Summary of Meeting on Trend Analysis, April 10, 1981" dated 4/20/81.

Exhibit #10: Four pages, handwritten notes regarding trending.

Exhibit #11: 5/19/81 Memo from Turnbull to Bird, Marguglio, Dietrich; re: Trend Program Phase III.

Exhibit #12: MPQA Site Operating Manual; Procedure No: SOM-2, 6/16/81; Trend Analysis Phase III.

Exhibit #13: Organization Chart of Midland Project Quality Assurance Department (MPQAD).

Exhibit #14: 2/9/81 Letter from J.W. Cook to Keppler, responding to 1/12/81 letter transmitting Inspection Report 80-32/80-33.

C. NRC Staff

Exhibit #1: 7/13/81 Letter from Keppler to Cook, transmitting I.E. Inspection Reports No. 50-329/81-12 and 50-330/81-12, of 5/18-22/81 regarding NRC assessment of MPQAD.

Exhibit #2: 7/27/81 Letter from J.W. Cook to Keppler, responding to Immediate Action Letter (IAL) of 5/22/81 re: Small Bore Piping.

Exhibit #3: 7/27/81 Letter from J.W. Cook to Denton, transmitting Woodward-Clyde Consultants' final report of 7/1/81.

Exhibit #4: 5/27/81 Final Report by Management Analysis Company (MAC-QA Audit).

Exhibit #5: Earthquake Frequency Map.

D. Joint NRC Staff/Consumers Power

Exhibit #1: Nuclear Regulatory Commission Staff/
Consumers Power Company Quality Assurance
Stipulation.

E. Intervenor Stamiris

Exhibit #1: 12/4/78 Memo from Keeley/Cooke,
regarding DGB settlement meeting of 11/2/78.

Exhibit #2: 7/9/80 Audit Finding Report, /s/ Don
Horn.

Exhibit #3: NRC Staff Testimony of Eugene J. Gallagher
with Respect to QA Program Implementation Prior
to 12/6/79 (including 17 attachments);

1. September 29, 1978: Initial 10 CFR 50.55(e)
Report from Consumers Power Co.
2. November 17, 1978: NRC Inspection Report
78-12.
3. January 12, 1979: Summary of December 4 1978
meeting.
4. February 23, 1979: NRC Presentation of Pre-
liminary Investigation Findings of the Settle-
ment of the Diesel Generator Building.
5. March 9, 1979: Consumers Discussion of NRC
Inspection Facts Resulting from NRC Investiga-
tion of the diesel generator building.
6. March 21, 1979: NRC 10 CFR 50.54(f) Request
Regarding Plant Fill.
7. March 22, 1979: NRC Inspection Report 78-20.
8. April 9, 1979: NRC Inspection Report 79-06.
9. April 24, 1979: Consumers Response to 10
CFR 50.54(f), Question 1.
10. June 6, 1979: Bechtel Review of U.S. Testing
Co. Field & Laboratory Test on Soils.
11. August 10, 1979: Bechtel Review of U.S. Testing
Co. Field & Laboratory Tests on Soils.
12. October 1, 1979: NRC Inspection Report 79-19.

13. October 16, 1979: Summary of July 18, 1979 Meeting.
14. November 13, 1979: Consumers Response to 10 CRF 50.54(f), Question 23.
15. December 6, 1979: Order Modifying Construction Permits.
16. April 16, 1980: Consumers Answer to Notice of Hearing.
17. Profession Qualifications of Eugene J. Gallagher.

Exhibit #4: (Non-existent)

Exhibit #5: Eight pages, including CPCo letter transmitting PSAR Amendment No. 3 (Dames & Moore Report) to NRC, Dames & Moore Report title page, Dames & Moore letter transmitting report to Bechtel, report pages 1, 9, 10, 11 and a page titled "NRC Preliminary Finding 4."

Exhibit #6: 9/28/78 meeting regarding settlements of structures south of the burbine building which are founded on fill.

Exhibit #7: 12/4/78 Bechtel meeting notes of CPCO, NRC, Bechtel, Consultants to inform NRC of status of settlements of DGB and other structures.

Exhibit #8: 11/1/78 notes of 10/18/78 meeting re: DGB instrumentation.

Exhibit #8A: Map of locations of DGB soil instrument locations.

Exhibit #9: 10/18/78 meeting notes re: site visit by John Dunnicliff.

Exhibit #10: 11/6/78 Memo from A.S. Marshall to Afifi re: 10/18/78 meeting and planned DGB surcharge instrumentation.

Exhibit #11: 11/7/78 Letter from Howell to Keppler, transmitting interim 50.55(e) report on settlement of DGB.

Exhibit #12: MCARR No. HPL-1, dated 8/8/80 and 8/11/80, re: Part 21 report on pipe whip restraints.

Exhibit #13: 11/1/78 Letter from Martinez to Keeley, confirming 10/25/78 meeting re: continuation of work on DGB pending final decision on remedial measures.

Exhibit #14: 12/20/79 Memo from Beloff(SRI) to Afifi, re: validity of Sondex readings.

Exhibit #15: 10/18/78 Letter from Peck to Afifi, confirming 11/6/78 arrival in Urbana, and question re: reliability of brine-field subsidence data in FSAR.

Exhibit #16: 11/6/78 handwritten meeting notes.

Exhibit #17: Response to 50.54(f) Question 21 re: DGB preload.

Exhibit #18: 12/15/78 Memo from B.H. Peck to File re: 12/8/78 consultant meeting regarding DGB surcharge program.

Exhibit #19: Boring Log of 9/29-30/77, Hole No. D.

Exhibit #20: 10/8/78 notes of meeting with A.J. Hendron re: DGB settlement with Hendron's corrections.

Exhibit #21: 10/8/78 meeting notes by Afifi - final draft.

Exhibit #22: 11/17/78 Letter from Hendron to Afifi, summarizing 11/7/78 meeting in Champaign.

Exhibit #23: 11/6/78 notes of meeting between Bechtel, CPCo and Hendron re: instrumentation and preloading.

Exhibit #24: 11/21/78 Memo from B.H. Peck to File re: DGB settlement meeting of 11/16/78 in Urbana, Illinois.

Exhibit #25: Notes of 10/25/79 Ann Arbor meeting with Bechtel, CPCo, Hendron and Gould.

Exhibit #26: 12/20/78 Memo from B.H. Peck to File re: 12/14/78 meeting with Bechtel regarding DGB settlement concerns.

Exhibit #27: Boring Log of 9/29/77, Hole No. E.

Exhibit #28: 1/18/81 Letter - SALP Report.

Exhibit #29: MCAR 24 close-out.

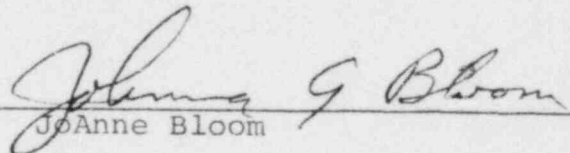
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

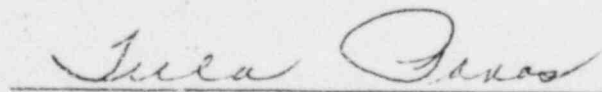
In the Matter of)	
)	Docket Nos. 50-329-OM
CONSUMERS POWER COMPANY)	50-330-OM
)	50-329-OL
(Midland Plant, Units 1)	50-330-OL
and 2))	

CERTIFICATE OF SERVICE

I, JoAnne Bloom, one of the attorneys for Consumers Power Company, hereby certify that a copy of "CPCo Proposed Findings of Fact and Law for Partial Decision in Quality Assurance and Management Attitude Issues" was served upon all persons shown in the attached service list by deposit in the United States mail, first class, this 28th day of October, 1981.


JoAnne Bloom

SUBSCRIBED AND SWORN before
me this 28th day of October,
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