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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

In the Matter of:)	Docket No. 50-329 OM
)	50-330 OM
CONSUMERS POWER COMPANY)	Docket No. 50-329 OL
)	50-330 OL
(Midland Plant Units 1 & 2))	

CONSUMERS POWER COMPANY'S PROPOSED SECOND
SUPPLEMENTAL FINDINGS OF FACT AND
CONCLUSIONS OF LAW FOR PARTIAL
INITIAL DECISION ON QUALITY
ASSURANCE ISSUES

January 27, 1984

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PROPOSED LEGAL OPINION

I. Introduction

This Partial Initial Decision concerns the quality assurance ("QA") issues in the portion of the consolidated Midland OM-OL proceeding dealing with soils remedial measures. In this Decision we first develop the applicable legal principles to guide our evaluation of the extensive record before us and then proceed to make extensive Findings of Fact ("Findings") followed by Conclusions of Law.

A. Issues From The Modification Order

The OM portion of the proceeding arose out of an Order for Modification of the Construction Permits issued by the NRC Staff pursuant to 10 C.F.R. § 2.204 on December 6, 1979. The Order, after reciting the problems with soils placement at the Midland site on which the Staff relied as basis for the Order, set forth the issues which could be contested in a hearing should Consumers Power Company ("Consumers Power " or "the Applicant") request one, as it did.

The two basic issues from the Modification Order which we were originally required to decide in this proceeding were: whether the facts upon which the Order was based were correct and were a sufficient basis for the Order; and whether the Order should be sustained.¹ As we note elsewhere² Appli-

¹ Order Modifying Construction Permits, December 6, 1979, at p. 6.

² See paragraphs 35 and 562 of our Findings.

cant has by stipulation agreed not to contest the sufficiency of the facts described in the Order as a basis for the Order. On that basis we have already found in the affirmative on the first question in our interim Order of April 30, 1982, Consumers Power Company (Midland Plant, Units 1 and 2), LBP-82-35, 15 N.R.C. 1060, 1064 (1982).

In our interim Order, LBP-82-35, we authorized amendments to the Midland Construction Permits which prohibited, absent explicit NRC Staff approval, all soils-related activities which would have been prohibited by the December 6 Order pending submission of an amendment to the construction permit application and issuance of an amendment to the construction permits authorizing the remedial actions. Id. at 1062, 1072. We stressed that we were

not at [that] time requiring the submission or approval of any amendments to the applications for construction permits (as provided by the Modification Order). In our opinion, the Staff consultation and approval which we [were] requiring [would] achieve the substantive results we believe[d] necessary without adding certain procedural requirements of an application for a construction permit amendment which, in the present context, do not appear to be necessary to attain the safety goals which we believe should be achieved.

Id. at 1072. We based this conclusion in part on the Staff's agreement "that it would accept information through meetings and presentations rather than an amendment to the application" and in part on a conclusion that the then voluntary agreement by Consumers Power not to proceed with certain remedial work without prior Staff approval had "resulted in adequate Staff

surveillance of the proposed remedial actions covered thereby, prior to Consumers' commencement of the remedial actions." Id. at 1067.

We also indicated in LBP-82-35 that we had "not yet completed our review of the second hearing issue -- i.e., "whether and, if so, to what extent, the Modification Order should be sustained." Id. at 1064-65. We noted that all parties in essence agreed that this issue was equivalent to the issue of whether quality assurance and quality control were being and were likely to be in the future properly implemented in the soils work at the site. Id. at 1065. We further indicated that we would, in our Partial Initial Decision, "reexamine the terms and conditions which we [were there] imposing on an interim basis." We stated that we might then "reaffirm, expand, or remove" the terms and conditions imposed in that Order. We analyze the basis for resolving the quality assurance/quality control issue below.

B. Issues From The Contentions

Three of the OM contentions of Ms. Stamiris raise issues related to soils quality assurance. The general allegation of the first of Ms. Stamiris' Contentions states:

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, . . . and this managerial attitude necessitates stricter than usual regulatory supervision (ALAB-106) to assure appropriate implementation of the remedial

steps required by the Order Modifying Construction Permits, dated December 6, 1979.

The general allegation of the second of these contentions states:

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
. . . .

The general allegation of the third of these three contentions states:

Consumers Power Company has not implemented its Quality Assurance Program regarding soil settlement issues according to 10 C.F.R. 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-106 and LBP-74-71) that proper quality assurance would ensue and it has not.

Because these contentions raise the general issue of management attitude's effect on quality assurance/quality control implementation, we are faced with questions of what evidence is probative with respect to management attitude and what that evidence implies regarding the proper completion of the plant. We develop below the analysis of regulation and case law which enable us resolve these issues as well.

II. Applicable Law

The legal principles governing this decision flow from the Atomic Energy Act of 1954 (as amended), 42 U.S.C. § 2011 et seq., and the Commission's regulations thereunder, as

contained in Volume 10 of the Code of Federal Regulations, including Part 50, Appendix B. As 10 C.F.R. § 2.204 and other sections in Subpart B of Part 2 make clear, what is at issue in a modification proceeding is an amendment to the construction permit. Thus the underlying legal standards we must apply are those pertinent to construction permits and amendments thereto.

A. Applicable Standards For QA Findings

In a construction permit hearing, part of the information required to be supplied to enable the Licensing Board to make the required findings concerns the Applicant's quality assurance program. Section 50.34 of 10 C.F.R. requires that the Preliminary Safety Analysis Report, which is part of the Construction Permit application, contain a description of a Quality Assurance Program meeting the requirements of Appendix B to 10 C.F.R. Part 50.³

The fundamental finding required by 10 C.F.R. § 50.35(a), however, also requires us to find that "the proposed facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public." (Emphasis

³ Appendix B defines quality assurance as comprising "all those planned and systematic actions necessary to provide adequate confidence that a structure, system or component will perform satisfactorily in service. Quality assurance includes quality control, which comprises those quality assurance actions related to the physical characteristics of a material, structure, component, or system which provide a means to control the quality of the material, structure, component, or system to predetermined requirements." In accordance with this definition, we use the term "quality assurance" or its abbreviation QA in this Opinion to encompass quality control unless the context dictates otherwise.

added.) The basis for this finding is in part technical information establishing the adequacy of the designs of the technical matters at issue.⁴ However, in the face of the existing record relating to QA performance at the Midland site, we must make a finding on the likelihood of future acceptable QA implementation at Midland. If we are unable to make an unqualified affirmative finding on that question, in order to make the general finding we must also examine all other measures beyond the Applicant's quality assurance program put in place by the Applicant and reviewed by the Staff to assure proper construction.

Evidence of past performance is probative on the issue of likelihood of future good performance. The Appeal Board indicated in Duquesne Light Company (Beaver Valley Power Station, Unit 2), ALAB-240, 8 A.E.C. 829, 833 (1974) that "actual performance at an ongoing construction project is a factor which must be taken into account in evaluating the likelihood that the established QA program for another project will be implemented." This rationale was recently applied in Washington Public Power System (WPPSS Nuclear Project No. 1), LBP-83-66, slip opinion at 10 (October 14, 1983) in deciding that basis existed for the admission of construction permit quality assurance contentions. See also Carolina Fower and Light Company (Shearon Harris Nuclear Power Plant, Units 1, 2, 3, and 4),

⁴ Our other Partial Initial Decision deals with these technical matters for the remedial soils program with one exception, the adequacy of the Diesel Generator Building surcharging program.

LBP-79-19, 10 N.R.C. 37, 60 (1979). However, we must also emphasize that perfection in either construction or quality assurance implementation is not a regulatory requirement. Consolidated Edison Company of New York, Inc. (Indian Point Station, Unit No. 2), ALAB-188, 7 A.E.C. 323, 334 (1974); Union Electric Company (Callaway Plant, Unit 1), LBP-82-109, 16 N.R.C. 1826, 1847 (1982).

The Callaway Appeal Board recently indicated that in reviewing construction and quality assurance deficiencies, Licensing Boards must decide whether these deficiencies have real significance with respect to the final as-built condition of the plant. In Union Electric Company (Callaway Plant, Unit 1), ALAB-740, Slip Opinion (September 14, 1983) at 1-3, the Appeal Board stated:

In any project even remotely approaching in magnitude and complexity the erection of a nuclear power plant, there inevitably will be some construction defects tied to quality assurance lapses. It would therefore be totally unreasonable to hinge the grant of an NRC operating license upon a demonstration of error-free construction. Nor is such a result mandated by either the Atomic Energy Act of 1954, as amended, or the Commission's implementing regulations. What they require is simply a finding of reasonable assurance that, as built, the facility can and will be operated without endangering the public health and safety. 42 U.S.C. §§ 2133(d), 2232(a); 10 CFR § 50.57(a)(3)(i). Thus, in examining claims of quality assurance deficiencies, one must look to the implication of those deficiencies in terms of safe plant operation.

Obviously, this inquiry necessitates careful consideration of whether all ascertained construction errors have been cured. Even if this is established to be the case, however, there may remain a question whether

there has been a breakdown in quality assurance procedures of sufficient dimensions to raise legitimate doubt as to the overall integrity of the facility and its safety-related structures and components. A demonstration of a pervasive failure to carry out the quality assurance program might well stand in the way of the requisite safety finding.

(Footnote omitted.)

We agree with and follow the Appeal Board's approach. We therefore take as the required fundamental inquiry in this phase of the proceeding whether, despite problems with quality assurance implementation at Midland, there are programs in place, including, but not limited to, the quality assurance program, which will eradicate all legitimate doubt as to the overall integrity of the facility's safety related structures and components. We examine in our findings, therefore, whether quality verification commitments are sufficient to root out any significant undetected errors, and whether programs beyond the quality assurance program, including the Work Authorization Procedure and third-party oversight, will assure that no significant undetected errors are created in the future.⁵

We consider the approach of the Shoreham Licensing Board to be appropriate to our situation, and we will examine

⁵ We must also determine the likelihood that "all ascertained construction errors [will] have been cured," Callaway, ALAB-740, slip opinion at 2, by the time soils remedial work is completed. We have no significant doubt that all known soils construction flaws will be remedied by the time the plant is ready to operate. Consumers Power has been extremely conscientious about remedying problems once known. And, with our own and the NRC Staff's continuing scrutiny, it is beyond reasonable expectation that a known error could slide by unrepaired.

whether we will be able to apply its words equally well to Midland at the time soils remedial work is completed:

Design, construction and installation at Shoreham has been affected by the long period of construction and the changing requirements of the A.E.C. and NRC during this period. Stepping back from the details of errors made, we have focused on the overall performance of LILCO and the Staff at Shoreham. Our perception is that neither has been perfect, nor could it have been with realistic use of resources. Nor is perfect performance expected by the Commission. We do conclude, however, that both LILCO and the Staff have had effective programs for identifying and correcting deficiencies. . . .

. . . .

The County's listing of breakdowns, taken as it is from LILCO's and the Staff's own inspection and audit findings is unarguably lengthy. To judge the significance, one must not only look at the nature of each finding, but judge the overall significance in terms of the totality of the programs. What was done, or will be done, to assure that potential deficiencies do not and will not affect overall plant performances adversely?

Long Island Lighting Company (Shoreham Nuclear Power Station, Unit 1), LBP-83-57, slip opinion at 206-08 (emphasis added). This question comes down to whether Consumers Power and the Staff together have created and implemented effective programs to accomplish the remedial soils work which will identify and correct any soils construction deficiencies which may occur.

B. Applicable Standards For Specific Management Attitude Findings

We admitted Ms. Stamiris' OM management attitude contentions in our Prehearing Conference Order Ruling on Conten-

tions and on Consolidation of Proceedings, dated October 27, 1980. We based that admission in part on the fact that Ms. Stamiris was not the first to raise questions regarding management attitude as a prerequisite for adequate quality assurance implementation. As early as 1973 the Appeal Board considered whether it had "reasonable assurance that the applicant and its architect-engineer would carry out the terms of the [quality assurance] program to the letter." Consumers Power Company (Midland Plant, Units 1 and 2), ALAB-106, 6 A.E.C. 182, 184 (1973). The Appeal Board indicated that an important consideration in making its "reasonable assurance" determination was the matter of "managerial attitude." It continued, "Unless there is willingness -- indeed, desire -- on the part of the responsible officials to carry it out to the letter, no program is likely to be successful." Id. at 184.

The term "attitude" denotes a state of mind, a quality at once evanescent and difficult of proof. The ALAB-106 Appeal Board characterized it in terms of "willingness" and "desire." One Licensing Board which has more recently examined questions analogous to those before us considered management attitude to be equivalent to management "motivation and personal commitment," Carolina Power and Light Company (Shearon Harris Nuclear Power Plant, Units 1, 2, 3, and 4), LBP-79-19, 10 NRC 37, 51-52 (1979). An important element in evaluating the credibility of management motivation and commitment to quality assurance, it said, is forthright recognition of past problems. Id. at 51.

The ALAB-106 Appeal Board, in evaluating whether the applicant's managerial attitude was acceptable, implicitly found that past implementation failures are probative of what it called "managerial attitude." 6 A.E.C. at 185. However, it did not find that such evidence was conclusive on the question of managerial attitude.

Past failures of QA management therefore may not be ignored, but changes in approach and correction of past failures should be given the most weight in considering whether an applicant now has the requisite character or attitude to continue to construct a nuclear power plant. In Virginia Electric & Power Co., (North Anna Nuclear Power Station, Units 1 and 2), LBP-77-68, 6 NRC 1127 (1977), the utility's management conceded that it had erred in the past, but the Licensing Board believed substantial improvement had been made. The Board concluded that in the light of the current management responsiveness in correcting items of noncompliance and its commitment to safe operation of the facility in compliance with all applicable requirements, the utility had demonstrated its commitment and qualification to run the facility. 6 NRC at 1151. As the Shearon Harris Licensing Board stated: "While motivation is important, a more reliable indicator of management attitude toward nuclear safety and quality is the commitment of the corporation's resources and its performance." 10 N.R.C. at 56 (emphasis added). See also Washington Public Power Supply System (WPPSS Nuclear Project No. 1), LBP-83-66, slip opinion (October 14, 1983) at 10. We have before us extensive evidence of what we consider to be a

very comprehensive effort to provide reasonable assurance of compliance with regulatory requirements, which obviously involves a massive commitment of resources, and we must weight this commitment heavily as evidence bearing on likelihood of future good performance.

We have heard a great deal of opinion evidence directly characterizing Consumers Power's "management attitude." We find that this evidence is largely subjective, sometimes self-serving, confusing, and substantially conflicting. Thus we find that such evidence is not of much use to us in making the necessary predictive findings. We set forth the highlights of this evidence in our Findings, but we do not reach any significant conclusions from it.

We note in conclusion that there is extensive evidence that Consumers Power is willing to take every reasonable measure to overcome the QA implementation problems at the site. The heart of our inquiry must remain whether "there is reasonable assurance [that] there will be no uncorrected safety-related inadequacies in the as-built . . . facility," South Carolina Electric and Gas Company (Virgil C. Summer Nuclear Station, Unit 2), LBP-82-57, 16 N.R.C. 477, 499 (1982), in light of those measures.

I N D E X

CONSUMERS POWER COMPANY'S PROPOSED SECOND
SUPPLEMENTAL FINDINGS OF FACT AND
CONCLUSIONS OF LAW FOR PARTIAL
INITIAL DECISION ON QUALITY
ASSURANCE ISSUES

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APPENDIX B

LIST OF EXHIBITS

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
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(Midland Plant, Units 1)	50-330-OL
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CONSUMERS POWER COMPANY'S
 PROPOSED SECOND SUPPLEMENTAL FINDINGS
 OF FACT AND CONCLUSIONS OF LAW FOR PARTIAL
 INITIAL DECISION ON QUALITY ASSURANCE ISSUES

I. INTRODUCTION

A. Reopening Of The Record

339. In this partial initial decision, we make findings concerning quality assurance ("QA") as it relates to the soils activities.⁹⁹⁰ We also consider certain subsidiary issues raised by specific contentions in this proceeding. These issues include Consumers Power Company's "dedication" to providing information,⁹⁹¹ the effect that financial and scheduling pressures have had in the soils settlement issues,⁹⁹² and

⁹⁹⁰ December 6, 1979 Order Modifying Construction Permits ("Modification Order").

⁹⁹¹ Stamiris OM Contention 1. Prehearing Conference Order Ruling on Contentions and on Consolidation of Proceedings, dated October 24, 1980.

⁹⁹² Stamiris OM Contention 2. Prehearing Conference Order Ruling on Contentions and on Consolidation of Proceedings, dated October 24, 1980.

Consumers Power's management attitude as it relates to soils QA implementation.⁹⁹³

340. We previously closed the record on these quality assurance/quality control ("QA/QC") issues on February 19, 1982. All interested parties submitted proposed findings of fact and conclusions of law and supplemental proposed findings and conclusions, and the Applicant filed replies to the proposed findings of the other parties. Before we could reach an initial decision on the issue of quality assurance, however, events occurred which caused us ultimately to reopen the record.

341. In a telephone conference call on April 28, 1982, the Staff advised the Board and the parties that the Region III Regional Administrator, James Keppler, might wish to modify his earlier testimony concerning the Applicant's quality assurance program.⁹⁹⁴ Mr. Keppler's prior testimony included a declaration that he believed there was reasonable assurance that the construction QA program with respect to soils remedial work would be implemented satisfactorily.⁹⁹⁵ The Board and the parties further discussed the possibility of Mr. Keppler modifying his prior "reasonable assurance" testimony in a telephone

⁹⁹³ Stamiris OM Contention 3. Prehearing Conference Order Ruling on Contentions and on Consolidation of Proceedings, dated October 24, 1980. See paragraph 549 *infra*.

⁹⁹⁴ April 30, 1982 Memorandum and Order (Imposing Certain Interim Conditions Pending Issuance of Partial Initial Decision ("April 30, 1983 Order") at p. 3, n. 4; July 7, 1982 Order at p. 2.

⁹⁹⁵ See paragraph 61 *supra*; Keppler, October 29, 1982 prepared testimony at pp. 1-2, following Tr. 15111.

conference call on May 5, 1982.⁹⁹⁶ In a letter to this Board dated June 29, 1982, the Staff informed the Board that it desired to supplement the previous testimony of Region III.

342. We treated the Staff's letter as a request to reopen the record. The parties discussed the Staff's request to reopen the record in a July 2, 1982 telephone conference call. In a Memorandum and Order issued on July 7, 1982, we formally reopened the record on quality assurance matters and announced that we would defer the issuance of a partial initial decision until after we had heard additional testimony on the QA issues which would be raised by Mr. Keppler's supplemental testimony.⁹⁹⁷ We also determined that additional testimony should be heard at the reopened hearing sessions concerning selected specific QA subissues that remained open.⁹⁹⁸

⁹⁹⁶ May 7, 1982 Order at p. 7.

⁹⁹⁷ July 7, 1982 Order at p. 3.

⁹⁹⁸ Id. at pp. 4-5. These issues included the qualifications of QC inspectors (see paragraphs 389-390, 455-459 infra), the adequacy of the QA program for underpinning work (see paragraphs 392-398 infra), nonconformance reports M01-4-2-008, M01-9-2-038, M01-9-2-051, 4199, and 4245 (see paragraphs 683-699 infra), the loose sands issue (see paragraphs 704-708 infra), the ACRS recommendation for a broader assessment of design adequacy and construction quality (see paragraphs 380-388, 492-505 infra), and drawing C-45.

Drawing 7220-C-45 indicates Q and non-Q areas for soils work at the Midland site. Consumers Power has revised the drawing in accordance with NRC Staff requirements, and the Staff has found drawing 7220-C-45 to be acceptable. See R. Cook, Landsman, Gardner and Shafer, October 29, 1982 prepared testimony with respect to quality assurance at pp. 7-8, following Tr. 11344; R. Cook, Gardner, Landsman and Shafer, March 25, 1983 prepared testimony at pp. 5-6, following Tr. 14374.

343. In prepared testimony filed on October 29, 1982, Regional Administrator Keppler explained the reasons for Region III's request to reopen the QA record. When Mr. Keppler testified in July 1981, he believed that Consumers Power would be rated a SALP Category I or II in the soils area, and in other areas, by April 1982.⁹⁹⁹ Accordingly, in his 1981 testimony, he expressed confidence that the Applicant's QA program for both remedial soils work and balance of plant would be properly implemented.¹⁰⁰⁰

344. In April 1982, however, Mr. Ronald Cook, NRC Senior Resident Inspector at Midland, stated to Mr. Keppler that, as of that date, he would rate Consumers Power's soils work and certain other construction activities as Category III under the SALP rating system. Because of the discrepancy between Mr. R. Cook's informal rating in April 1982 and Mr. Keppler's predictions at the time of his July 1981 testimony and because of concerns over implementation of QA raised by contemporaneous events at the site, Mr. Keppler determined that his testimony should be supplemented.¹⁰⁰¹

345. Prior to the Staff's June 29, 1982 request to reopen the QA record, the Region III Division Directors pre-

⁹⁹⁹ Keppler, October 29, 1982 prepared testimony with respect to quality assurance at p. 2, following Tr. 15111. SALP is an acronym for Systematic Assessment of Licensee Performance.

¹⁰⁰⁰ See paragraph 61 *supra*; Keppler, October 29, 1982 prepared testimony with respect to quality assurance at pp. 1-2, following Tr. 15111.

¹⁰⁰¹ Keppler, October 29, 1982 prepared testimony with respect to quality assurance at pp. 2-3, following Tr. 15111; see also Keppler, Tr. 15162-15163, 15261-15262.

pared a memorandum at the request of Mr. Keppler to advise him of perceived problems and recommendations in the QA area.¹⁰⁰² We surmise that the problems cited in this memorandum also influenced Regional Administrator Keppler in his decision to request the opportunity to supplement his prior testimony.¹⁰⁰³

346. The NRC Staff initially filed testimony on the reopened QA issues on October 29, 1982. On November 15, 1982, Consumers Power filed testimony related to the five nonconformance reports which were referred to in our July 7, 1982 Order.¹⁰⁰⁴ The Staff supplemented its initial prefiled testimony with further QA testimony on March 25, 1983. Consumers Power filed testimony on QA/QC matters in response on April 11, 1983. Reopened hearings related to QA/QC and management attitude were held during 1983 in Midland, Michigan on February 14 - February 18, April 27 - April 30, May 2 - May 6, June 1 - June 4, June 6 - June 10, June 27 - July 1, July 28 - July 30, August 1 - August 4, September 20 - September 23, October 31 - November 4, and November 7 - November 9, and in Bethesda, Maryland on December 3, 1983.¹⁰⁰⁵

1002 Keppler, October 29, 1982 prepared testimony with respect to quality assurance, Attachment A, following Tr. 15111.

1003 See Keppler, Tr. 15133, 15164.

1004 See note 998 supra.

1005 On June 8, 1983 we held an in camera hearing session. We do not discuss the evidentiary presentation made during that session because we find it to be of no consequence.

B. April 30, 1982 Order

347. Following the December 6, 1979 Modification Order, Consumers Power voluntarily committed not to proceed with further remedial soils activities without NRC Staff review and concurrence.¹⁰⁰⁶ On April 30, 1982, we issued a "Memorandum and Order (Imposing Certain Interim Conditions Pending Issuance of Partial Initial Decision)." In that Order, we found that the voluntary agreement between Consumers Power and the NRC Staff "resulted in adequate Staff surveillance of the proposed remedial actions covered thereby, prior to Consumers' commencement of the remedial actions."¹⁰⁰⁷ Moreover, at that time, we were satisfied that the procedures being employed by Consumers Power and the Staff in presenting, reviewing, and approving proposed remedial work covered by this commitment were adequate.

348. However, it was apparent to us that Consumers Power's voluntary commitment was not fully satisfactory because its scope was not coextensive with the portions of the December 6, 1979 Order which would have modified the Midland Construction Permits had that Order been immediately effective. This Board found that the voluntary agreement between Consumers Power and the Staff was not clearly defined in scope and it was not interpreted to extend to all the activities which Part IV

¹⁰⁰⁶ Keeley, prepared testimony on cost and scheduling at p. 13, following Tr. 1163. See also April 30 Order at p. 11.

¹⁰⁰⁷ April 30, 1982 Order at p. 12.

of the Modification Order would have prohibited and which we thought should be covered.¹⁰⁰⁸

349. After reviewing the record that was then available, we determined in the April 30 Order that, in order for the Board to have reasonable assurance that the project would be completed in full accordance with regulatory requirements, Consumers Power should be allowed to conduct certain soils activities near safety related structures or facilities outside the scope of its voluntary commitment only after receiving Staff review and approval.¹⁰⁰⁹ Because of safety concerns with underground piping,¹⁰¹⁰ because of concerns over the extent to which QA plans and controls were to be applied to underpinning activities¹⁰¹¹ and because of a number of related problems and/or potential problems,¹⁰¹² we required that, pending the issuance of a partial initial decision, the Midland Construction Permits "be amended to prohibit (in the absence of Staff approval) the same activities as would have been prohibited by Section IV of the Modification Order." Specifically, we ordered that Consumers Power be required to obtain explicit prior approval from the NRC Staff before proceeding with most soils-related activities.¹⁰¹³ The activities covered are more ex-

1008 Id. at pp. 12-13, 15-16.

1009 Id. at pp. 14-15.

1010 Id. at pp. 13-14.

1011 Id. at p. 15.

1012 Id. at pp. 13-19.

1013 Id. at pp. 19-22.

plicitly described in the April 30 Order. In addition, we required that such activities, except for those which the Staff finds to be not critical, be controlled by a Staff-approved QA plan.¹⁰¹⁴

350. In reaching this conclusion, we also considered it important that the QA/QC deficiencies noted in the Modification Order were not the first instances where Consumers Power had experienced QA/QC implementation problems.¹⁰¹⁵ In addition, we interpreted the Staff's testimony that it then had reasonable assurance that proposed remedial activities would be performed in accordance with regulations to be premised upon the Staff having the opportunity to review proposed resolutions to unresolved questions related to the activities.¹⁰¹⁶

351. At the threshold of these findings, it is appropriate to consider whether our Order should be modified. At this time, we believe that the conditions imposed by our April 30 Order should continue in order for there to be reasonable assurance that the soils-related activities at the Midland plant are completed in a manner consistent with regulatory requirements. Since the record on QA/QC was reopened, we have heard testimony concerning a number of deficiencies which indicate that QA/QC implementation continued to be a concern after our April 30 Order. Examples include drilling and excavation incidents, the diesel generator building inspection, and

1014 Id. at p. 21. See paragraphs 392-398 infra.

1015 Id. at p. 9.

1016 Id. at p. 11.

other QA/QC problems in both soils and balance of plant. Although most of the diesel generator buildings inspection results are not specifically germane to soils QA implementation, they are relevant to QA implementation in general at the site, and hence we must consider them in this context at least as background.

352. As we noted in our April 30 Order, under the December 6, 1979 Modification Order, the most stringent condition we could impose on soils-related construction activities at the Midland site would be "to prohibit such activities pending submission of an amendment to the applications and issuance of construction-permit amendments authorizing remedial action".¹⁰¹⁷ We believe that such an action would prove no more effective at providing reasonable assurance of compliance with regulatory requirements than does the procedure which we instituted in our April 30 Order.¹⁰¹⁸ We also note that no member of the Staff has suggested that the April 30 Order needs strengthening in order for the Staff to appropriately monitor and control Consumers Power's construction activities with respect to soils work. For these reasons, we have decided that the requirements set forth in our April 30 Order, as interpreted below, continue to be appropriate, and we sustain the December 6, 1979 Order only insofar as it is consistent with our April 30 Order.

1017 Id. at p. 9, n. 21.

1018 See April 30, 1982 Order at p. 20.

353. Regional Administrator Keppler indicated that he would like to eventually see the Staff get out of the direct approval chain for the release of soils work on the Midland Project.¹⁰¹⁹ However, in light of the concerns discussed in these findings, we find it necessary to continue this procedure at the present time. Should Mr. Keppler decide at some later time that this procedure is no longer necessary to provide reasonable assurance of construction and QA adequacy in the soils area, we invite him to so inform us in writing and we will then consider completely lifting the requirements imposed by our April 30 Order. But even absent our formally lifting the April 30 Order, the Staff has full discretion to modify or eliminate the current Work Authorization Procedure and provide blanket approval for generic work activities. The Staff can exercise its review and approval authority in a piecemeal fashion for individual design, construction, or QA activities or the Staff can exercise its authority under this Order by reviewing the soils-related activities in integrated packages.¹⁰²⁰ In this manner, the Regional Administrator can, without necessarily returning to this Board for specific authorization, modify the implementation procedure of our April 30 Order and return more complete control of the Project to Consumers Power as he becomes satisfied with Consumers Power's performance. We therefore recognize that the Staff can

1019 See Keppler, Tr. 15626-15628.

1020 See April 30, 1982 Order at p. 19. For a description of the Work Authorization Procedure, see paragraphs 368-369 infra.

exercise its discretion to modify the Work Authorization Procedure to achieve this result. We also emphasize that these are construction permit amendment findings. It is implicit in a construction permit amendment that the Staff has broad authority to approve changes in design details consistent with overall acceptance criteria without returning to the Board for approval.

C. Organization Of These Findings and Identification of Key Issues

354. In our other partial initial decision, we reached conclusions regarding all aspects of the technical compliance of the soils remedial activities with regulatory requirements.¹⁰²¹ In this partial initial decision, we deal with the other aspect of compliance with regulatory requirements, satisfactory implementation of a quality assurance program.

355. The December 6, 1979 Modification Order set forth certain ultimate factual issues with respect to quality assurance which we are to decide. These were whether the facts concerning the soils settlement issues set forth in that Order were correct and were a sufficient basis for the Order and whether the Order should be sustained. We have found in the affirmative on the first question.¹⁰²² With respect to the second issue, we must decide whether the quality assurance program for soils remedial work is being implemented in accor-

¹⁰²¹ Our resolution of one technical issue, namely the adequacy of the surcharging as a remedial measure for the diesel generator building, has been postponed.

¹⁰²² See April 30, 1982 Order at p. 7; see also paragraph 35 supra.

dance with regulatory requirements and whether there is reasonable assurance that satisfactory implementation of QA requirements will be achieved throughout the remainder of the soils construction process.¹⁰²³ If we are not able to reach a final decision on the latter question, we are required at least to find that the QA program plus other measures implemented by the Applicant and the Staff provide us reasonable assurance that the soils remedial measures will be completed in accordance with design and regulatory requirements. Intervenor Stamiris' contentions also raised particularized concerns regarding quality assurance.

356. We heard extensive evidence regarding quality-related implementation with respect to soils remedial work. In addition, we permitted, from time to time, evidentiary presentations on matters which were not directly related to soils remedial activities, although virtually all such evidence related to one or more aspects of quality assurance implementation. We have been quite liberal in receiving evidence because we wished to have as full an understanding as possible of the background against which the remedial soils QA activities at the Midland site are being carried out.

357. In order to make the requisite findings, we consider whether the soils program presently in place, including the QA/QC program, the Work Authorization Procedure, and NRC Staff and third-party scrutiny, provides sufficient controls and checks to ensure that construction deficiencies will

1023

See paragraph 36 supra.

be prevented or identified and corrected such that the soils work can be completed in accordance with design and regulatory requirements. We find that, for the present, the controls in place over and above the QA/QC program are both necessary and sufficient, but we allow for the possibility of their relaxation at a later date.

358. This phase of the proceedings has been characterized by all the parties and the Board as dealing with quality assurance and management attitude issues. There are contentions which require us to reach specific conclusions regarding both quality assurance implementation and management attitude. As stated in our Opinion, the existence of a satisfactory QA program is a regulatory requirement for construction permits. Obviously, QA implementation is a matter of paramount concern to the NRC and this Board. But we must keep in mind that the ultimate question, as we stated in our Legal Opinion, is "whether Consumers Power and the Staff together have created and implemented effective programs to accomplish the remedial soils work which will identify and correct any soils construction deficiencies which may occur."¹⁰²⁴

359. Management attitude, on the other hand, is a matter of concern to the NRC and this Board only to the extent to which it can be shown that management attitude detracts from QA programs and implementation and, in that manner, upon compliance with regulatory requirements. In our judgment, it is the programs that are in place and their implementation which are the most probative evidence of both management attitude and

¹⁰²⁴ Legal Opinion at p. 10.

"reasonable assurance" for future compliance with regulatory requirements. Accordingly, in these findings, we first address the programs which have been implemented to assure compliance with regulatory requirements in the soils remedial work. We then turn to the inspection of the diesel generator building which occurred in the fall of 1982 and the month of January, 1983 and which revealed significant quality assurance implementation problems in balance of plant work. Consumers Power's response to the results of that inspection and other improvements recently implemented in the balance of plant area are considered in these findings as indicators of management attitude and as secondary indicators of the likelihood of full compliance with regulatory requirements at the end of soils construction.

360. We have heard testimony regarding a variety of quality assurance implementation incidents in addition to the ones identified in the diesel generator building inspection and the ones specifically enumerated in admitted contentions. We discuss the details of many of these specific quality assurance implementation problems in Appendix A. For each of these problems, we examine whether the specific item and its generic implications have been resolved. Those quality assurance implementation problems with respect to soils remedial work which have occurred since the remedial work was resumed in 1982 are discussed in the first section of our findings because they bear upon the effectiveness of programs presently in place and

thus are directly relevant to any predictive findings as to QA implementation in the soils area.

361. We also consider those portions of the record which are relevant to the contentions admitted in these proceedings. Beyond their specifics, the contentions raise the diffuse issue of management attitude. We find that the programs which are in place and their implementation provide the most relevant and convincing evidence of management attitude. In addition, persuasive evidence of management attitude includes such matters as the ability of management to recognize problem areas, initiate effective corrective actions and be responsive to concerns and findings of the NRC Staff.

362. A subjective evaluation of management attitude is tempting but not likely to be productive. Subjective evidence of another's state of mind is inherently unreliable. Subjective evidence of one's own state of mind is likely to be self-serving. A subjective inquiry into management attitude includes evaluation of the credibility of management personnel and those individuals' willingness to comply with regulatory requirements. Although we have permitted extended cross examination testing the credibility of Consumers Power management witnesses, and although we have permitted questioning which called for subjective evaluations of Consumers Power managerial employees by NRC Staff members, we are unable to reach a conclusion about management attitude on the basis of such unreliable and conflicting testimony.

363. There were two investigations carried out by the NRC Office of Inspections during the pendency of the OM hearings on which we heard evidence. The first involves an allegation by NRC Staff members that Consumers Power personnel had misrepresented the status of installation of electrical instrumentation cable in March, 1982. The second involves allegations that Consumers Power violated the terms of our April 30, 1982 Order by excavating without NRC approval on two occasions in the summer of 1982. We deal with the specifics of these two subjects in the final section of the findings.¹⁰²⁵

¹⁰²⁵ The final appendix attached hereto is a complete list of exhibits identified during the course of these proceedings. It is a corrected and updated version of the hearing exhibit list submitted with Applicant's Proposed Findings of Fact and Conclusions of Law on Remedial Soils Issues, dated August 5, 1983.

II. CONSUMERS POWER'S GENERAL IMPROVEMENTS
FOR MANAGEMENT OF SOILS WORK

A. Introduction

364. We emphasize at the outset that a large majority of the soils remedial work is of types completely novel to nuclear construction projects, for example, the underpinning of major structures. Thus quality control and quality assurance procedures had to be completely invented for much of the work. Under these circumstances, it is not surprising that some mistakes were made. At the time of our April 30, 1982 Order, however, various incidents related to quality in the soils area convinced us that further action needed to be taken. Consequently, we imposed the requirements outlined in our April 30 Order. Consumers Power itself recognized the problems in QA implementation in soils work and initiated programs to further improve its control of those activities in the summer of 1982. Since that time, moreover, Consumers Power has steadily taken more and more comprehensive and effective steps to improve management of soils work and quality assurance and quality control execution. To be sure, some of these steps have been suggested or even urged by the NRC Staff. Nevertheless, we find that there has been an increasing willingness on Consumers Power's part both to accept NRC Staff suggestions and to make positive changes on its own. The various changes, described chronologically below, coupled with vigorous NRC Staff enforcement and oversight, have resulted in and should continue to lead to improved implementation of the soils remedial program.

B. Excavation Permit System

365. Bechtel procedure FIC 5.100, Rev. 1, entitled Excavation Permit System, has been in effect since June 24, 1982.¹⁰²⁶ The procedure is intended to prevent disturbance of foundation subgrade for structures, maintain the integrity of compacted backfill, protect existing buried installations, and provide notification to affected parties of planned work.¹⁰²⁷ Consumers Power has committed to have the procedure cover all excavations in "Q" soils. For some time, Consumers Power exempted underpinning excavations from the coverage of this system because of the separate controls in place for work of this type. However, at the urging of the Staff, Consumers Power brought underpinning within the purview of the system.¹⁰²⁸ All anticipated excavations, including drilled holes, pile driving, and open pit excavations, are subject to the requirements of this procedure.¹⁰²⁹

366. Under procedure FIC 5.100, a permit with the proper signatures is required before the commencement of any excavation work. Bechtel Field Engineering's signature on an excavation permit indicates that there has been a review of

¹⁰²⁶ See Bird and Wheeler, prepared testimony concerning five specified NCRs, Attachment 1, following Tr. 11408. This revision supercedes Rev. C, which was implemented on May 24, 1982.

¹⁰²⁷ Bird and Wheeler, prepared testimony concerning five specified NCRs, Attachment 1 at p. 1, following Tr. 11408.

¹⁰²⁸ Landsman, Tr. 16289-16295.

¹⁰²⁹ Bird and Wheeler, prepared testimony concerning five specified NCRs at p. 8, following Tr. 11408.

existing underground utilities and that appropriate action has been taken to protect them. Field Engineering has responsibility for identifying any structure or utility which may be encountered within the confines of the excavation. The Bechtel Lead Civil Engineer's signature on an excavation permit shows that the need for additional procedures has been examined. The Bechtel on-site Geotechnical Engineer signs off to indicate that he has determined the influence of the proposed work on adjacent structures or utilities and whether there are adequate protections to prevent damage. Consumers Power Construction signs off to verify that the work is authorized by the NRC. And, MPQAD's sign off (which is required only for work in "Q" soils) indicates an awareness of the work and a commitment that appropriate QA/QC coverage will be provided.¹⁰³⁰

367. Applicant expects that FIC 5.100 will, in conjunction with the joint Consumers Power/NRC Staff Work Authorization Procedure and the Consumers Power/Bechtel Soils Work Permit System, provide adequate controls to prevent damage to underground utilities.¹⁰³¹ The NRC Staff agrees that these

¹⁰³⁰ Id. at p. 8 and Attachment 1.

¹⁰³¹ Id. at pp. 9-10.

Applicant notes, however, that it may continue to encounter some temporary or non-"Q" buried utilities during drilling or excavation operations because its records of these buried installations are not complete enough to totally eliminate the chance of such occurrences. Id. at p. 10.

The Work Authorization Procedure is discussed at paragraphs 368-369 infra. The soils work permit system was instituted in the summer of 1982 as an internal system for controlling the release of work to the work forces on site. It is a means by which Consumers Power releases the contractor to do soils work. Mooney, Tr. 17068-17069.

procedures should insure that future work activities in the remedial soils area will be accomplished in accordance with the quality requirements.¹⁰³²

C. Work Authorization Procedure

368. During the summer of 1982, certain on-going soils remedial work was subject to prior NRC Staff approval under the terms of our April 30 Order. In August 1982 Consumers Power halted its on-going soils work as a result of an allegation that it had violated that Board Order. Specifically, there was some question as to the procedures required for NRC Staff approval of excavations.¹⁰³³

369. After the August work stoppage, Consumers Power and the Staff initiated the Work Authorization Procedure which is a formal mechanism for implementing our Order.¹⁰³⁴ The Work Authorization Procedure provides for Region III review and authorization of all activities covered by our April 30 Order. Under the procedure, Consumers Power submits a list of work activities which it proposes for the next 60-day period to the Staff. The Staff reviews the list and designates activities as critical or non-critical, allowing Consumers Power to proceed

¹⁰³² R. Cook, Landsman, Gardner and Shafer, October 29, 1982 prepared testimony with respect to quality assurance at pp. 4-5, following Tr. 11344. See also Landsman, Tr. 11931.

¹⁰³³ Mooney, prepared testimony on remedial soils work at p. 4, following Tr. 17017; see also paragraphs 598-678 infra.

¹⁰³⁴ Shafer, Tr. 14607, 14614-14615; Keppler, October 29, 1982 prepared testimony with respect to quality assurance, Attachment H, following Tr. 15111.

with the non-critical activities without further review. For activities designated as critical, the Staff advises Consumers Power of the details needed for complete review. Once the NRC Staff is satisfied that the activities can proceed, they provide written authorization for the activities.¹⁰³⁵ Dr. Landsman testified that the Work Authorization Procedure has resolved problems regarding work package approval.¹⁰³⁶ Dr. Landsman testified that, because of the Work Authorization Procedure, remedial soils work may continue.¹⁰³⁷

D. New Organization: Creation Of Soils Project And MPQAD Soils Section

370. In its April 1982 SALP II report, the NRC Staff questioned the Midland Quality Assurance Department's ("MPQAD") ability to monitor properly the remedial soils work.¹⁰³⁸ At a meeting on June 26, 1982 to discuss that report, Mr. Keppler addressed the continuing QA/QC concern in the soils work.¹⁰³⁹ During this same period, he announced the formation of the Office of Special Cases, a team of NRC inspectors assigned exclusively to the Midland and Zimmer projects and supervised

1035 Keppler, October 29, 1982 prepared testimony with respect to quality assurance, Attachment H, following Tr. 15111.

1036 Landsman, Tr. 14617.

1037 Landsman, Tr. 14685.

1038 Stamiris Exhibit No. 55.

1039 Keppler, Tr. 15162-15163.

by Mr. Warnick, and within that Office a Midland Section under the direction of Mr. Wayne Shafer.¹⁰⁴⁰

371. At the same time the NRC Staff was looking into this issue, Applicant began its own comprehensive review of the soils remedial work and its attendant QA/QC concerns.¹⁰⁴¹ Included in this evaluation were examinations of the resources committed to the soils project and the overall soils QA/QC effort including the need for improved QA implementation.¹⁰⁴² In July 1982 James Meisenheimer, an experienced geotechnical engineer, was assigned to Midland and appointed MPQAD Soils Superintendent for civil and remedial soils work.¹⁰⁴³

372. At an August 26, 1982 meeting with the NRC Staff, the Applicant announced, among other things, the formation of a new soils project organization. The separate MPQAD soils organization headed by Mr. Meisenheimer was also announced.¹⁰⁴⁴ The soils project organization provides for single-point accountability for the performance of remedial

1040 Keppler, October 29, 1982 prepared testimony with respect to quality assurance at pp. 3-4, following Tr. 15111; Keppler, Tr. 15164, 15533. Mr. Keppler also testified as to the structure of the Special Cases team and the members' various responsibilities. See Keppler, Tr. 15533-15537.

1041 Mooney, prepared testimony on remedial soils work at p. 3, following Tr. 17017.

1042 Id.

1043 Wells, prepared testimony on quality assurance at pp. 1-2, following Tr. 18027.

1044 Keppler, Tr. 15195; Wells, prepared testimony on quality assurance at pp. 1-2, following Tr. 18027.

soils work. Mr. Mooney became the single point of accountability for all remedial soils work, other than MPQAD functions.¹⁰⁴⁵

373. The engineering and construction supervisors in charge of soils work report operationally to a Bechtel Assistant Project Manager who reports to Mr. Mooney. Scheduling groups were reorganized and also report directly to Mr. Mooney. Weekly meetings involving Engineering, Construction, and Quality groups facilitate coordination of activities in the soils area. Mr. Mooney testified that the soils project organization also brings a higher level management presence on-site through a field soils manager, an assistant resident project engineer, and the MPQAD soils superintendent, Mr. Meisenheimer.¹⁰⁴⁶

374. During testimony, Dr. Landsman expressed the opinion that certain MPQAD supervisory personnel were not qualified for their positions. Specifically, he was concerned that Mr. Meisenheimer lacked experience in quality assurance supervision.¹⁰⁴⁷ However, Dr. Landsman did not question Mr. Meisenheimer's technical expertise in soils engineering work.¹⁰⁴⁸

375. Further testimony revealed that Mr. Meisenheimer brought to his job 13 years of engineering and design experience on at least 7 nuclear projects during which time he

1045 Mooney, prepared testimony on remedial soils work at p. 16, following Tr. 17017.

1046 Mooney, prepared testimony on remedial soils work at pp. 15-17, following Tr. 17017.

1047 Landsman, Tr. 14535-14537.

1048 Landsman, Tr. 16471.

operated under QA programs at high levels.¹⁰⁴⁹ The position he holds is unique in nuclear power projects.¹⁰⁵⁰ Dr. Landsman acknowledged that it would be rare to find someone with experience in both soils engineering and quality assurance management. He did not claim that Consumers Power, by hiring Mr. Meisenheimer, deliberately overlooked someone with both an extensive quality background and the requisite technical knowledge for the underpinning work.¹⁰⁵¹ Mr. Meisenheimer also testified as to his experience, especially as it related to quality assurance.¹⁰⁵² He indicated that several of his previous assignments involved significant quality control responsibility.¹⁰⁵³ In addition, Mr. Wells testified that various of the top managerial personnel within MPQAD who Dr. Landsman thought were unqualified for their QA positions had ten years or more QA/QC experience and were well qualified for their positions.¹⁰⁵⁴

376. The opinions expressed by Dr. Landsman with regard to the qualifications of MPQAD personnel and other personnel in the soils area were his personal opinions and not

1049 Wells, Tr. 18199.

1050 J. Cook, Tr. 18200-18201.

1051 Landsman, Tr. 16474-16475.

1052 See Consumers Power Exhibit No. 34; Meisenheimer, Tr. 19613-19633.

1053 Id.

1054 Wells, Tr. 18204-18205. See also Landsman, Tr. 14535-14538, 14540.

shared by the Staff.¹⁰⁵⁵ In fact, when Dr. Landsman's fellow inspectors were polled as to their own opinions, they either disagreed with Dr. Landsman's assessment or withheld judgment as to individuals' qualifications.¹⁰⁵⁶ Mr. Shafer noted that there is no regulatory requirement which details the requisite experience for supervisors of QA organizations.¹⁰⁵⁷ According to Mr. Keppler, any Staff concerns regarding MPQAD personnel qualifications would be raised by him, and he has never received a Staff recommendation for the removal of any MPQAD personnel.¹⁰⁵⁸ Specifically, he has never been told by Dr. Landsman that Mr. Meisenheimer is unqualified.¹⁰⁵⁹ Based upon the evidence presented, we do not conclude that Mr. Meisenheimer is unqualified for his position.

E. September 17, 1982 Proposals

377. Darrell Eisenhut, Director, Division of Licensing, NRR, and James Keppler, Regional Administrator of Region III, met with Consumers Power's top corporate management representatives, Messrs. Selby and J. Cook, and with the project manager for soils, Mr. Mooney, on August 26, 1982 to discuss

1055 R. Cook, Gardner, Landsman and Shafer, March 25, 1983 prepared testimony with respect to quality assurance at p. 5, following Tr. 14374; Landsman, Tr. 16539-16540.

1056 R. Cook, Shafer, Gardner, Tr. 16448-16456; Gardner, Tr. 16478, 16529.

1057 Shafer, Tr. 16446.

1058 Keppler, Tr. 15587-15588.

1059 Id.

the NRC Staff's concerns regarding Consumers Power's QA/QC implementation including soils activities.¹⁰⁶⁰ There was general discussion at that meeting of the need to increase Consumers Power's management involvement in QA in light of the Staff's view that Bechtel should not continue in a lead role with regard to QC.¹⁰⁶¹ Mr. Keppler asked that Consumers Power promptly formulate a proposal to address these concerns¹⁰⁶² and Consumers responded with an outline of proposals at a September 2, 1982 meeting.¹⁰⁶³

378. At the request of Mr. Keppler for further details,¹⁰⁶⁴ Consumers Power later submitted two letters on September 17, 1982 to Messrs. Keppler and Denton which set forth measures the Applicant intended to take in order to upgrade quality assurance implementation.¹⁰⁶⁵ The first of these letters (Serial No. 18845) describes changes in the soils area, and the second (Serial No. 18850) relates to balance of plant

¹⁰⁶⁰ Keppler, October 29, 1982 prepared testimony with respect to quality assurance at pp. 4-5, following Tr. 15111.

¹⁰⁶¹ See paragraph 464 *infra*. See also Shafer, Tr. 14530; Gardner, Tr. 14452-14453, Landsman, Tr. 14923; Shafer, Tr. 16300.

¹⁰⁶² Keppler, Tr. 15201, 15221.

¹⁰⁶³ Keppler, October 29, 1982 prepared testimony with respect to quality assurance at pp. 4-5, following Tr. 15111; Keppler, Tr. 15201; Mooney, Tr. 17058-17060.

¹⁰⁶⁴ Keppler, Tr. 15201-15203, 15207; Mooney, Tr. 17058-17059.

¹⁰⁶⁵ Keppler, October 29, 1982 prepared testimony with respect to quality assurance, Attachments E and F, following Tr. 15111.

work.¹⁰⁶⁶ According to one member of the Office of Special Cases Midland team, the September 17, 1982 letter (Serial No. 18845) represented a written commitment to changes that had been under development for some time.¹⁰⁶⁷ The proposal incorporated the following major changes:

1. retention of an independent third party to assess implementation of underpinning work;
2. integration of soils QA and QC under MPQAD;
3. creation of a soils project with single point accountability;
4. upgraded QC inspection training especially in underpinning work;
5. development of a specific QIP for soils remedial work;
6. increased Consumers Power management involvement in soils QA;
7. improvement of design commitment tracking and accounting.¹⁰⁶⁸

379. According to Mr. Mooney, the actions taken pursuant to this plan have proven very effective in the soils area.¹⁰⁶⁹ While there was apparently no formal Staff approval of the September 17, 1982 letter (Serial No. 18845),¹⁰⁷⁰ Mr.

¹⁰⁶⁶ Id. The second September 17, 1982 letter (Serial No. 18850) is discussed in paragraph 451 infra.

¹⁰⁶⁷ Gardner, Tr. 14454.

¹⁰⁶⁸ See Mooney, prepared testimony on remedial soil works at pp. 4-24, following Tr. 17017.

¹⁰⁶⁹ Mooney, Tr. 17171.

¹⁰⁷⁰ Keppler, Tr. 15242-15257.

Keppler testified that the NRC Staff was reasonably satisfied with the plan.¹⁰⁷¹ It appears that analogues of many of the changes committed to in this letter were incorporated into the CCP and formally approved there.

1. S & W third party review

380. We believe that a significant innovation on the part of Consumers Power was the commitment in the September 17 letter (Serial No. 18845) to retain an independent third party to assess implementation of underpinning work.¹⁰⁷² This commitment was made after the previously mentioned events during 1982 which raised concerns on the part of Consumers Power management and the NRC Staff with the progress and performance of the soils remedial work and QA implementation.¹⁰⁷³ The commitment has broadened significantly since the original September 17 proposal.

381. Consumers Power selected Stone & Webster Engineering Corporation ("S&W"), an engineering and construction firm, to conduct this third party review. S&W sought assistance from Parsons, Brinckerhoff, Quade & Douglas ("Parsons"), an engineering, design, planning and construction management firm (referred to jointly as the "S&W/Parsons team").¹⁰⁷⁴ S&W is a large engineering and construction organization with

1071 Keppler, Tr. 15257.

1072 Mooney, prepared testimony on remedial soils work at p. 4, following Tr. 17017.

1073 Id.

1074 Id. at p. 6.

considerable experience in designing and building nuclear power plants.¹⁰⁷⁵ It has successfully conducted similiar independent assessments at the Summer and Diablo Canyon Nuclear Stations. Parsons has special expertise in the area of soils construction and, in particular, underpinning work.¹⁰⁷⁶ It has conducted foundations, tunnelling, excavation and underpinning work on such projects as the San Francisco, Washington D.C., Baltimore and Atlanta Mass Transit Systems.¹⁰⁷⁷

382. Mr. Mooney, Consumer Power's Executive Manager -- Midland Project Office, reviewed the resumes of S&W team members before they were permanently assigned to Midland.¹⁰⁷⁸ Their credentials demonstrate that they are highly qualified professionals with many years experience in soils construction.¹⁰⁷⁹ Following a meeting on September 2, 1982 with the NRC during which Consumers Power described its Action Plan for the soils work, the necessary contracts were signed and the S&W/Parsons team was on site by September 20, 1982.¹⁰⁸⁰

1075 Id. at p. 7.

1076 Id.

1077 Id. at p. 8.

1078 Mooney, Tr. 17260.

1079 Mooney, prepared testimony on remedial soils work at p. 8, following Tr. 17017; Consumers Power Exhibit No. 33, Appendix B. While some of the S&W team members had worked at nuclear power plants which had some QA difficulties, there was no evidence that the particular individuals were in any way involved in the difficulties. See Mooney, Tr. 17267; J. Cook, Tr. 18544-18545; Keppler, Tr. 15445-15446, 15464.

1080 Mooney, prepared testimony on remedial soils work at p. 6, following Tr. 17017.

383. In 1982 NRC Commissioner Palladino in a letter to Congressmen Ottinger and Dingell established independence and competence criteria against which the NRC Staff evaluates third party reviewers of work at nuclear plants (the "Palladino Criteria").¹⁰⁸¹ Using these criteria, the NRC Staff assessed Consumers Power's use of the S&W/Parsons team.¹⁰⁸² Specifically, on November 5, 1982, the NRC convened a public meeting to discuss, among other things, the S&W/Parsons team's credentials and independence; at this meeting Consumers Power presented the qualifications of all those assigned to the S&W/Parsons team.¹⁰⁸³ Consumers Power made several submittals to the NRC Staff regarding questions raised both at and after this meeting.¹⁰⁸⁴ As it had done at other plants, the NRC Staff also carefully reviewed the team.¹⁰⁸⁵ They examined, among other things, whether the S&W/Parsons organizations and the individuals from the organizations assigned to work at Midland were free from ties with Consumers Power, whether the team had adequate technical competence, and whether the individual team members had been involved with acceptable work on other pro-

1081 Keppler, March 25, 1983 prepared testimony with respect to quality assurance at pp. 2-3 and Attachment 2, following Tr. 15114; Mooney, prepared testimony on remedial soil works at p. 8, following Tr. 17017.

1082 Keppler, March 25, 1983 prepared testimony with respect to quality assurance at pp. 2-3, following Tr. 15114.

1083 Mooney, prepared testimony on remedial soils work at p. 7-8, following Tr. 17017. See also Stamiris Exhibit No. 93.

1084 Mooney, prepared testimony on remedial soils work at p. 7, following Tr. 17017.

1085 Keppler, Tr. 15418.

jects.¹⁰⁸⁶ In the case of S&W, the Region III NRC Staff acknowledged their reputation for competence in QA and engineering.¹⁰⁸⁷ Further, the NRC Staff screened the specific individuals involved and consulted with different NRC regional offices concerning the competence of both the companies hired and personnel assigned.¹⁰⁸⁸ On February 24, 1983, after making this review, the NRC Staff approved the S&W/Parsons team as both sufficiently competent and independent to conduct the Midland third party remedial work review.¹⁰⁸⁹

384. On December 9, 1982 Consumers Power received authorization to start work on underpinning piers W12 and E12.¹⁰⁹⁰ Yet, as noted, the Staff did not approve the S&W/Parsons team until February 24, 1983. Mr. Keppler testified, however, that the Staff had reviewed the team and could have approved it much earlier.¹⁰⁹¹

385. The scope of the third party soils assessment encompasses both a review of the Midland soils design documents and construction plans and observation of construction itself.¹⁰⁹²

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- 1086 Keppler, Tr. 15433-15435, 15447; Sinclair Exhibit No. 3.
1087 Keppler, Tr. 15445.
1088 Keppler, Tr. 15464, 15458, 15475.
1089 Keppler, March 25, 1983 prepared testimony with respect to quality assurance, Attachment 1, following Tr. 15114.
1090 Keppler, March 25, 1983 prepared testimony with respect to quality assurance at p. 3, following Tr. 15114.
1091 Keppler, Tr. 15420.
1092 Mooney, prepared testimony on remedial soils work at p. 6, following Tr. 17017.

This assessment is intended to assure that (1) the design intent is implemented; (2) construction is consistent with industry standards; (3) the quality assurance program is satisfactorily implemented; and (4) construction is performed in accordance with construction documents.¹⁰⁹³ This review also includes an assessment of the qualifications of soils QC inspectors and an examination of the underpinning of the auxiliary building and service water pump structure being done by Mergentime and Spencer, White & Prentis.¹⁰⁹⁴ Although originally scheduled to cover at least three months, the actual duration of the review will be determined by the team itself.¹⁰⁹⁵ We have received reports from S&W which indicate that its review is ongoing. The review will continue until the team is fully satisfied.¹⁰⁹⁶

386. In February, 1983, the NRC Staff discussed with Consumers Power the need to increase the scope of the review.¹⁰⁹⁷ Subsequently, the scope was amended to include several specific line items, particularly a QA overview and an assessment of design work packages to assure both their accuracy and adequacy before the packages are submitted to the NRC Staff for their review and approval under the Work Authorization Procedure.¹⁰⁹⁸

¹⁰⁹³ Id.; Mooney, Tr. 17233.

¹⁰⁹⁴ Mooney, Tr. 17247, 17336; Mooney, prepared testimony on remedial soils work at pp. 11-12, following Tr. 17017.

¹⁰⁹⁵ Mooney, Tr. 17225; Mooney, prepared testimony on remedial soils work at pp. 11-12, following Tr. 17017.

¹⁰⁹⁶ Id. See paragraphs 421-423 infra.

¹⁰⁹⁷ Mooney, Tr. 17228.

¹⁰⁹⁸ Mooney, Tr. 17249, 17252-17253, 17255-17256.

387. There is continual communication among the parties involved with the soils assessment. The S&W/Parsons team holds daily meetings with Consumers Power and Bechtel personnel; the NRC Staff is invited to these meetings.¹⁰⁹⁹ The daily meetings and their results are summarized in weekly reports, which also include a description of the activities the team has observed, the quality documents and records reviewed, the observations made concerning work activities, and the progress made in closing out findings or Nonconformance Identification Reports ("NIRs").¹¹⁰⁰ These weekly reports are sent to the NRC Staff.¹¹⁰¹ Through use of NIRs, the team records its findings of work which has deviated from procedures, codes, specifications or proper construction practices.¹¹⁰² NIRs are held "open" until Consumers Power provides the team with a resolution of the problem which is acceptable to the team.¹¹⁰³ Only the S&W/Parsons team has authority to actually close out an NIR.¹¹⁰⁴

388. As of April, 1983, the S&W/Parsons team had already conducted extensive reviews of the remedial soils

1099 Mooney, prepared testimony on remedial soils work at p. 13, following Tr. 17017.

1100 Id. at pp. 13-14; Mooney, Tr. 17278-17279.

1101 Id.

1102 Mooney, prepared testimony on remedial soils work at pp. 13-14, following Tr. 17017.

1103 Id.

1104 Mooney, Tr. 17280-17281.

work.¹¹⁰⁵ Among other things, it had examined the vertical access shaft, the material storage area, the test facility and off-site batch plant, and QA documents.¹¹⁰⁶ S&W/Parsons reviewers had observed excavation, and the placing of reinforcements on Piers W-12 and E-12 and the concreting of Pier W-12.¹¹⁰⁷ They had reviewed underpinning drawings, procedures, related documents and the performance of Consumers Power QA/QC personnel involved with them.¹¹⁰⁸ S&W's assessment of performance of the underpinning work is described in paragraphs 421-423 infra.

2. Retraining and recertification
of soils QC inspectors

389. Another measure undertaken by Applicant in response to the August 26, 1982 and September 2, 1982 meetings with the NRC Staff was the commitment to retrain and recertify all soils QC inspectors.¹¹⁰⁹ Region III inspectors conducted an inspection of the QC recertification process in September of 1982 and determined that there were problems with the manner in which the examinations for certification were being administered. The inspectors also observed that a QA examiner was using a controlled copy of a Project Quality Control Instruction ("PQCI")

¹¹⁰⁵ Mooney, prepared testimony on remedial soils work at pp. 2, 12-13, following Tr. 17017.

¹¹⁰⁶ Id.

¹¹⁰⁷ Id.

¹¹⁰⁸ Id.

¹¹⁰⁹ Id. at p. 15; Wells, prepared testimony on quality assurance at p. 4, following Tr. 18027.

which differed from another controlled copy of the PQCI which was obtained from the QC records vault.¹¹¹⁰

390. On September 24, 1982, Region III issued a confirmatory action letter which was the culmination of Staff review of the administration of oral examinations and which included commitments for the recertification process.¹¹¹¹ Consumers Power's commitments included the issuance of a stop work order for virtually all work on remedial soils with some exceptions, the suspension of all examinations relating to remedial soils QC inspector requalifications, the decertification of all remedial soils QC personnel previously certified, the establishment of a retraining program for all QC personnel who fail the recertification exams, and the development of a written examination for all remedial soils QC recertifications.¹¹¹² While the recertification program was first administered only in the soils quality organization, the program has since been extended to apply to all QC personnel. Mr. Wells testified that all QC personnel certified to the inspection plans which support soils work have already been subject to the upgraded program.¹¹¹³

1110 R. Cook, Gardner, Landsman and Shafer, March 25, 1983 prepared testimony with respect to quality assurance, Attachment 1b, following Tr. 14374.

1111 Id.

1112 Id. The remedial soils work which was not subject to the stop work order was the continuous activity such as maintenance of the freeze wall.

1113 Wells, prepared testimony on quality assurance at pp. 4-5, following Tr. 18027.

3. Quality Improvement Program

391. Mr. Mooney of Consumers Power described the separate Quality Improvement Program ("QIP") established for the soils project at the site.¹¹¹⁴ The QIP is a means used by management to stress quality improvement to workers and craftspeople and to provide measurements and recognition of quality improvement.¹¹¹⁵ The program was originally began for Bechtel craftspeople in November 1981. In September 1982, a separate QIP was established for the soils project. The program is intended to instill in workers the attitude of doing the job right the first time, to measure worker performance, to recognize quality performance, and to encourage suggestions for improvements.¹¹¹⁶ Mr. Rutgers was of the opinion that the QIP has resulted in improved performance at the plant.¹¹¹⁷

¹¹¹⁴ Mooney, prepared testimony on remedial soils work at pp. 19-20, following Tr. 17017.

¹¹¹⁵ Mooney, Tr. 17078-17082; Rutgers, Tr. 18656-18657; see also Shafer, Tr. 16729-16731.

In his prepared testimony, Dr. Landsman criticized the upper management of Consumers Power for not playing an active role in conveying principles of quality assurance to the working level construction staff so as to insure that QA principles were being properly carried out. R. Cook, Landsman, Gardner and Shafer, October 29, 1982 prepared testimony at pp. 5-6 and Attachment 8, following Tr. 11344. We do not find support in the record upon which we can reach such a conclusion.

¹¹¹⁶ Mooney, Tr. 17078-17082; Rutgers, Tr. 18654-18657; see also Shafer, Tr. 16729-16731.

¹¹¹⁷ Rutgers, Tr. 18113-18114.

F. Quality Plans

392. MPQP-1 and MPQP-2 are the Midland Plant quality plans which describe the basic QA program controls to be applied to items and activities associated with the remedial soils work and underpinning activities at the plant site. The scope of MPQP-1 and MPQP-2 covers SWPS underpinning work, Auxiliary Building underpinning work and work in the feed water isolation valve pit areas. The plans also apply to both safety related and non-safety related remedial soils activities.¹¹¹⁸

393. MPQP-1 provides a detailed written description of the application of Applicant's and Bechtel's QA programs to the work performed by the two underpinning subcontractors at the plant site without their own Nuclear QA program.¹¹¹⁹ The plan describes the principal QA management organizations at the plant site, details the interface between these organizations, and defines their QA functions. Detailed implementation procedures developed under Applicant's general QA program to cover all phases of the underpinning work are also referenced where applicable in the text of MPQP-1.¹¹²⁰

¹¹¹⁸ Gilray, October 29, 1982 prepared testimony relative to the quality assurance program for underpinning activities at pp. 1-2, 4, following Tr. 16854.

¹¹¹⁹ Bird, prepared testimony on quality assurance at p. 7, following Tr. 16975; Landsman, Tr. 16899, 16921-16924. Under existing Consumers Power and Bechtel Topical Reports each subcontractor at the plant site is required to have such a QA plan. Landsman, Tr. 16919-16920. The two main underpinning subcontractors at the plant site without their own QA plans are Mergentime and Spencer, White and Prentis. Landsman, Tr. 16875, 16924.

¹¹²⁰ Bird, prepared testimony on quality assurance at p. 7, following Tr. 16975; Bird, Tr. 16976-16977.

394. MPQP-2 documents Applicant's overall commitment that remedial soils work and activities be covered by QA program controls previously approved by the NRC in existing Consumers Power and Bechtel Topical Reports. The plan specifically provides that MPQAD will review and assure that design documents, procurement orders and implementing procedures contain appropriate quality requirements and that work activities include adequate inspection plans and are properly audited to verify that they are correctly being carried out. MPQP-2 also contains the commitment to have prior Region III concurrence before any soils work is excluded from QA program coverage. Additionally, the scope of MPQP-2 was written to be consistent with the requirements of this Licensing Board's April 30, 1982 Order.¹¹²¹

395. Drafts of MPQP-2 and MPQP-1, Rev. 3, were coordinated with the NRC prior to issuance.¹¹²² Initial responsibility for reviewing MPQP-1 and MPQP-2 at the NRC was assigned to Dr. Ross Landsman, Region III inspector for Midland Plant underpinning activities and Mr. John W. Gilray, principal QA Engineer in the Office of Nuclear Reactor Regulation. Upon completion of their initial review, Dr. Landsman and Mr. Gilray found the plans to be conditionally acceptable. Revised drafts of MPQP-1 and MPQP-2 incorporating the Staff's acceptance

¹¹²¹ Gilray, October 29, 1982 prepared testimony relative to the quality assurance program for underpinning activities at pp. 2, 4-5, following Tr. 16854; Bird, prepared testimony on quality assurance at p. 8, following Tr. 16975.

¹¹²² Bird, prepared testimony on quality assurance at pp. 8-9, following Tr. 16975.

conditions were submitted by Applicant to the NRC for approval on August 9, 1982. Revision 3 of MPQP-1 and the original issue of MPQP-2 received unconditional NRC Staff approval on September 16, 1982.¹¹²³

396. Applicant has revised MPQP-1 and MPQP-2 from time-to-time to ensure that they remain current. The latest revisions of the plans are contained in MPQP-1, Rev. 5 and MPQP-2, Rev.1.¹¹²⁴ Responsibility for reviewing revisions to the plans subsequent to MPQP-1, Rev. 3 and MPQP-2, Rev. 0 has rested with Dr. Landsman and Mr. Wayne D. Shafer of NRC Region III.¹¹²⁵ Dr. Landsman and Mr. Shafer testified that they have reviewed all subsequent revisions to MPQP-1 and MPQP-2, includ-

¹¹²³ Gilray, October 29, 1982 prepared testimony relative to the quality assurance program for underpinning activities at pp. 2-3, following Tr. 16854.

Approval was obtained from the Office of NRR and is contained in Chapter 17 of Supplement No. 2 of the Midland SER, Staff Exhibit No. 14 dated October 1982 (NUREG-0793). Id. at p. 3.

¹¹²⁴ Gilray, Landsman and Shafer, March 25, 1983 prepared testimony with respect to the quality assurance program for underpinning activities at p. 2, following Tr. 16859; Shafer Tr. 16861.

In addition, Applicant has submitted a draft copy of Revision 6 to MPQP-1 to the NRC for its review. See Consumers Power Exhibit No. 44.

¹¹²⁵ Gilray, Landsman and Shafer, March 25, 1983 prepared testimony with respect to the quality assurance program for underpinning activities at pp. 2-3, following Tr. 16859.

Revisions are approved under the NRC and Consumers Power work authorization procedures. Bird, prepared testimony on quality assurance at p. 9, following Tr. 16975. Witness Shafer stated that Mr. Gilray at NRR will no longer review future changes in MPQP-1 and MPQP-2 unless such changes also result in a change to Applicant's Topical Report. Shafer, Tr. 16861.

ing the then most recent revisions, MPQP-1, Rev. 5 and MPQP-2, Rev. 1, and have found them to be acceptable.¹¹²⁶

397. According to Dr. Landsman, the NRC Staff believes that MPQP-1 and MPQP-2 contain all the necessary language to provide adequate QA plans for the underpinning and remedial soils activities at the Midland Plant site.¹¹²⁷ Mr. Gilray testified that the NRC Staff also believes that the plans comply with previously approved QA requirements described in Applicant's and Bechtel's Topical Reports and in our April 30, 1982 Order.¹¹²⁸ Additionally, Dr. Landsman and Mr. Shafer indicated that they have found the change in MPQP-1 to document the incorporation of QC responsibility into MPQAD to be an improvement in the plan. Mr. Gilray added that the revision to Applicant's Topical Report, CPC-I-A, Rev. 13, reflecting this change is acceptable to the NRC.¹¹²⁹

1126 Gilray, Landsman and Shafer, March 25, 1983 prepared testimony with respect to the quality assurance program for underpinning activities at p. 3, following Tr. 16859. The one change in MPQP-1 that Dr. Landsman and Mr. Shafer found to be significant is the change which reflects the fact that all QC responsibility has been removed from the Bechtel organization and assigned to MPQAD. This change was first reflected in MPQP-1, Rev. 4 and has been carried over to MPQP-1, Rev. 5. Gilray, Landsman and Shafer, prepared testimony at p. 3, following Tr. 16854; Shafer Tr. 16863-16866.

1127 Landsman, Tr. 16871. See also Gilray, Landsman and Shafer, March 25, 1983 prepared testimony with respect to the quality assurance program for underpinning activities at p. 3, following Tr. 16859.

1128 Gilray, October 29, 1982 prepared testimony relative to the quality assurance program for underpinning activities at pp. 4-5, following Tr. 16854.

1129 Gilray, Landsman and Shafer, March 25, 1983 prepared testimony with respect to the quality assurance program for underpinning activities at p. 3, following Tr. 16859.

398. Based on the foregoing findings, we conclude that, as written, MPQP-1 and MPQP-2 contain sufficiently detailed QA instructions for the two underpinning subcontractors without their own Nuclear QA plans at the Midland Plant site. The Board finds reasonable assurance that Applicant has adequately instituted QA program coverage for all remedial soils activities and underpinning work at the Midland Plant.¹¹³⁰

G. Assessment Of Recent Remedial
Soils Work Implementation

399. Beginning in the summer of 1982, the NRC Staff authorized work preliminary to the actual underpinning work for the Auxiliary Building. On December 9, 1982, the Staff authorized Consumers Power to begin excavation work for the installation of piers W12 and E12.¹¹³¹ Mr. Keppler relied upon the recommendations of Dr. Landsman and the Midland Section in releasing this soils work.¹¹³²

400. The NRC Staff and S&W both concluded that the underpinning work authorized on December 9, 1982 was satisfactorily performed. As a result, the Staff has authorized further underpinning work to continue.¹¹³³ Dr. Landsman testified that,

1130 See December 6, 1979 Modification Order at pp. 3-4; April 30, 1982 Order at pp. 15-16, 21.

1131 Mooney, prepared testimony on remedial soils work at p. 21, following Tr. 17017.

1132 Keppler, Tr. 15310, 15293-15294.

1133 See Mooney, prepared testimony on remedial soils work at pp. 21-24, following Tr. 17017; see also paragraphs 421-422 infra.

although he is concerned with the performance of soils QA management personnel, he believes Mergentime and soils QC personnel are doing a satisfactory job on the underpinning work.¹¹³⁴ Dr. Landsman reached this conclusion even though the Staff had concluded that Consumers Power's performance in soils remedial work had declined during the period of the SALP III appraisal and was rated a "low three."¹¹³⁵ Moreover, the Staff has not discovered any problems with the performance of the underpinning work significant enough to warrant a recommendation to Mr. Keppler that remedial soils work should be halted.¹¹³⁶

401. Mr. Mooney of Consumers Power testified that he believes implementation of remedial soils work has been improving since mid-September 1982. Likewise, Mr. J. Cook concluded that implementation of the remedial soils program has been successful.¹¹³⁷ Nevertheless Consumers Power has taken seriously the recent negative comments of the Staff in the SALP III report and is committed to performing the remedial soils work

1134 Landsman, Tr. 16904-16905, 16920.

1135 Staff Exhibit No. 24 at p. 1; R. Cook and Landsman, Tr. 20658-20663.

1136 Keppler, Tr. 15321-15323; Shafer, Tr. 16550; R. Cook, Gardner, Landsman and Shafer, March 25, 1983 prepared testimony with respect to quality assurance at p. 5, following Tr. 14374.

We note that Consumers Power received a Category III rating for the soils area in both the SALP II and SALP III reports. These reports are discussed in paragraphs 539-547 infra. The specific incidents supporting the rating have been drawn to our attention, and we have considered them in reaching our conclusions.

1137 Mooney, Tr. 17120; J. Cook, Tr. 18414-18415.

to a level satisfactory to the Staff.¹¹³⁸ In the following section, we address specifically recent incidents which have taken place in the remedial soils area and which are relevant to the SALP III report period.

H. Specific Quality Incidents Encountered In Remedial Soils Work Since December 1982

402. We heard evidence concerning a number of incidents related to the remedial soils work which occurred during 1983. We also received into evidence S&W's first written assessment of the underpinning work. These matters are described below. We find that none of the incidents referred to present a safety concern and that the matters have all been satisfactorily resolved. We further find that the first S&W written appraisal was quite positive. Accordingly, we are of the opinion that soils remedial work can continue with NRC Staff approval.

1. Violation of hold tags

403. Dr. Ross Landsman raised a concern with the bypassing of hold tags in the underpinning work.¹¹³⁹ Adjacent to the access shafts near the feedwater isolation valve pits and under the turbine building, there are drifts (horizontal tunnels) which act as access ways to permit excavation of materials and movement under the turbine building.¹¹⁴⁰ The surface at the top of the drifts is not smooth because of the use of air

1138 See paragraph 547 infra.

1139 Landsman, Tr. 16692-16693.

1140 Mooney, Tr. 17402-17404.

hammers to remove the turbine building concrete mud slab. Plates are bolted to the tops of the drifts and these plates were installed according to in-plant Hilti-bolt specifications. Because of the rough surface, these specifications are inappropriate for underground work, and more than a 1/16-inch gap between the plate and the concrete resulted in many places. This resulted in conditions which did not conform to the specifications as written, and when QC personnel did an inspection they attached hold tags to the plates.¹¹⁴¹

404. Workers who had been using the drifts for several weeks prior to the inspection walked through the drifts after the hold tags were in place and began working. By walking through the tunnel, they had, in effect, technically by-passed the hold tags.¹¹⁴² These hold tag violations occurred on May 9, 1983. The field soils organization ("FSO") immediately stopped work informally and sent 53 workers home that day. On May 10, 1983, the problem was resolved between FSO and MPQAD and work was resumed. Stone and Webster informed the NRC resident inspectors of the incident.¹¹⁴³

405. The Board finds that the incident involving the by-passing of hold tags in the underpinning drift is not indicative of either poor QA implementation or poor management attitude. The applicant identified the problems with the base

1141 Id.

1142 Id.

1143 Stamiris Exhibit No. 89, attaching May 13, 1983 memorandum from Warnick to Eisenhut; Mooney, Tr. 17337-17338.

plates and with the by-passing of the hold tags and promptly resolved these items.

2. Shallow probing

406. On February 10, 1983, construction personnel were performing a shallow probing operation to the north of the service water pump structure.¹¹⁴⁴ The purpose of the probing was to locate buried utilities. Because a mudmat which had been poured adjacent to a Q duct bank obstructed the search, it had to be removed from the search area. The mud mat was physically attached to the duct bank because of the way the concrete had been poured. In order to separate the mudmat from the duct bank, a workman with a pneumatic drill had to drill a straight line of 14 holes in the mud mat at the line of connection to the duct bank so that the mud mat could be broken free of the duct bank and removed.¹¹⁴⁵ During this drilling process the workman failed to maintain the drill, which was hand held, in a perfectly vertical orientation. The very presence of the concrete mudmat prevented the workman from seeing the bottom corner of the duct bank below and adjacent to the mud mat. Because of the drill's offset from the vertical, the hand-held drill nicked the bottom edge of the duct bank in 14 different locations.¹¹⁴⁶ Since Q concrete is a different color from

1144 Wheeler, Tr. 11410.

1145 Landsman, Tr. 14725; Wheeler, Tr. 18833.

1146 See Stamiris Exhibit No. 54. See also Wheeler, Tr. 18833-18834.

non-Q concrete, the mistake became apparent as soon as the duct bank was exposed.

407. On February 14, Consumers Power issued NCR number FSO-050 with respect to this incident.¹¹⁴⁷ Applicant's witness on this subject characterized the work resulting in the drilling of the duct bank as somewhat careless. NRC Inspector Ross Landsman indicated that the root cause of the nonconformance was lack of attention to detail on the part of the workers.¹¹⁴⁸ Mr. Mooney testified that conduit was not exposed as a result of this incident.¹¹⁴⁹

3. Jacking of the FIVP

408. Dr. Landsman expressed concerns during 1982 that the existing grillage support system would not hold the full weight of the feedwater isolation valve pit ("FIVP") and that the rock anchors which attached the grillage assembly into the roof of the FIVP were inadequate. One of his major concerns was whether the weight of a concrete mudmat attached to the undersides of the FIVPs had been considered in the design of the support system. He also contended that Consumers Power resisted the NRC's recommendation for jacking the FIVP for a year because following the recommendation would delay Consumers Power's construction schedule.¹¹⁵⁰

1147 See Stamiris Exhibit No. 54. Even though the NCR is on a Bechtel form, because MPQAD is totally integrated, the form was prepared and submitted by the Applicant. Landsman, Tr. 14727.

1148 Landsman, Tr. 14731.

1149 Mooney, Tr. 17175-17176.

1150 Landsman, Tr. 14632-14634.

409. Concerning the disagreement between Consumers Power and the NRC as to whether or not to do a load test, Mr. Mooney of Consumers Power testified that Consumers' was not motivated by a concern for schedule, but rather that Consumers Power was concerned that lifting the FIVP might detune the support system, which had been adjusted after the prior load test to even out loads. Detuning would mean that each bolt would no longer carry its specified load.¹¹⁵¹ Mr. Wheeler testified that the jacking of the FIVP that was originally done in June of 1981 was for a greater load than what was done in the second proof load jacking required by the NRC Staff which took place after Consumers Power had completed modifications to the support system. Mr. Wheeler testified that, since the second proof load jacking was done to a value less than the original jacking, it was unnecessary. Moreover, Mr. Wheeler confirmed that Consumers Power had been reluctant to do the second jacking because of the possibility that it might detune the support system that had been modified.¹¹⁵²

410. Mr. Mooney recalled that the disagreement as to whether to do the second jacking and how much load to use lasted possibly a couple of months. He said that Dr. Landsman was concerned that the load should be increased to include the load of a mud mat attached to the FIVPs. Consumers Power took the position that the mud mat would be broken off during the excavation and that the support system would never experience

1151 Mooney, Tr. 17145.

1152 Wheeler, Tr. 18879-18883, 18861.

the load of the mud mat. The NRC Staff did not accept Consumers Power's position and Consumers Power agreed to perform the FIVP load test.¹¹⁵³

411. Dr. Landsman discussed two items of concern that were encountered during the second jacking of the FIVP. The first item concerned cracking of the top slab of the FIVP during the jacking. The second matter involved a concern that the subcontractor which was recording data during the jacking had waited the wrong amount of time after the jacks were released to record the data.¹¹⁵⁴ One crack in the FIVP exceeded the alert level,¹¹⁵⁵ and as a result, the consultant, Construction Technology Labs ("CTL"), was notified. Dr. Corley of CTL, as required by the crack monitoring specification, reported to Bechtel within 1/2 hour after inspecting the crack as to whether Bechtel could resume construction. His recommendation was affirmative. The consultant also prepared a report to Consumers Power dated February 19, 1983 which was supplied to the NRC.¹¹⁵⁶ Consumers Power followed the procedure which was required as part of the crack monitoring program for the FIVP. CTL made recommendations concerning the cracking and identified the probable cause as increased load associated with a locked hanger at the roof of the FIVP for Unit 1. Minor cracking occurred in Unit 2 of the FIVP but it was in different loca-

1153 Mooney, Tr. 17143-17145.

1154 Landsman and R. Cook, Tr. 14636-14640.

1155 Mooney, Tr. 17145-17146, 17020.

1156 Landsman, Tr. 14641-14642.

tions from the cracking in Unit 1 and was believed to be caused by residual stress.¹¹⁵⁷

412. With regard to the NRC Staff's contention that data was not recorded within the proper time period, Mr. Mooney testified that data was required to be taken within one hour of release of the jacking. The subcontractor had taken the data five minutes after the release. Accordingly, Mr. Mooney believed that the procedures had been properly followed. In response to a request by Mr. R. Cook, data was also taken later.¹¹⁵⁸

4. Pier 11 West load test

413. A load test was planned for Pier 11 West for the purpose of confirming the design parameters that had been assumed for the auxiliary building permanent underpinning wall.¹¹⁵⁹ Carlson stress meters were to be used to measure the load on the pier. In the course of preparing for and undertaking the load test, three different issues arose. The first of these was a problem with the interface between two different PQCI's. The second issue related to the transfer of information from one PQCI to a revised PQCI. The third matter had to do with the load test itself and the inability to transfer the full load to the bottom of the pier.

414. With regard to the first of the three issues, Mr. Robert Wheeler of Consumers Power testified that he was at

1157 Mooney, Tr. 17018-17021, 17146-17148.

1158 Mooney, Tr. 17150-53.

1159 Landsman, Tr. 14664-14666.

a meeting in Glen Ellyn on April 20, 1983 with members of the Region III Staff. During this meeting, he received a telephone call from someone at the site. The caller informed him that there was a potential problem with PQCI's related to the Carlson stress meters. Mr. Wheeler instructed the caller to discuss the matter with MPQAD and to call him back if there was a problem.¹¹⁶⁰ Dr. Landsman knew of the potential problem with the PQCI's at the time of the Glen Ellyn meeting on April 20, 1983. At hearings, he criticized Mr. Wheeler and other Consumers Power's employees who were present at the meeting for not informing him of the problem at the meeting. Dr. Landsman acknowledged that he did not inquire of them as to the PQCI problem because he was testing to see whether they would volunteer the information.¹¹⁶¹ Mr. Wheeler testified that he did not believe he had an obligation to inform the NRC staff of the potential problem at the April 20, 1983 meeting.¹¹⁶² Dr. Landsman had indicated to Consumers Power employees that they should have all necessary information available before relaying it to the NRC Staff in order to avoid misunderstandings in the soils area.¹¹⁶³ Mr. Wheeler believed he did not have adequate information at the April 20, 1983 meeting to convey to the NRC Staff.¹¹⁶⁴

1160 Wheeler, Tr. 18786-18787.

1161 Landsman, Tr. 16792-16793, 16832-16833, 16694-16695.

1162 Wheeler, Tr. 18786-18787.

1163 Landsman, Tr. 16519-16520.

1164 Wheeler, Tr. 18786-18787.

415. The next day at the site, Mr. Wheeler followed up on this matter at a morning staff meeting. He was informed that the concern had been resolved and determined that there was no need to report the matter to the NRC Staff.¹¹⁶⁵ The concern had been that there were two PQCIs, one relating to the pouring of the pier itself and the other relating to the Carlson meters, each of which included the requirement that the other one be closed out first.¹¹⁶⁶ The matter was resolved by modifying the PQCI related to the Carlson meters. This modification was done by issuing a new PQCI for the meters and discontinuing the old one.¹¹⁶⁷

416. During that same week, Consumers Power sought authorization from the NRC Staff to start the load test.¹¹⁶⁸ Mr. Mooney discussed the load test with members of the Region III Staff and, in response to a question from Mr. Warnick concerning testing of the instrumentation, Mr. Mooney replied that to the best of his knowledge there were no problems.¹¹⁶⁹ Following this conversation, Mr. Mooney ordered that a complete review of all documentation associated with Pier 11 West be undertaken. This review found no problems.¹¹⁷⁰ The Pier 11 West load test was begun on April 25, 1983.¹¹⁷¹

1165 Id.

1166 Mooney, Tr. 17180-17181; Wheeler, Tr. 18788.

1167 Mooney, Tr. 17181.

1168 Wheeler, Tr. 18904.

1169 Mooney, Tr. 17179-17180.

1170 Mooney, Tr. 17180.

1171 Mooney, Tr. 17356.

417. On or about May 5, 1983, the NRC Staff requested that Consumers Power provide all documentation for the Pier 11 West load test. In gathering the information for the Staff, Consumers Power QA discovered the second concern with the Carlson PQCIs. Signatures and information had been improperly transferred to the Carlson meter inspection record which was revised as a result of the April 20, 1983 discovery of the earlier PQCI interface problem. Consumers Power on May 5, 1983 immediately informed representatives of the NRC Staff concerning the problem discovered with the transfer of information to the revised PQCI and inspection record.¹¹⁷²

418. The third issue referred to the load readings obtained from the Carlson stress meters. Consumers Power attributed the problem with transferring the full load to the bottom of the pier to a problem with the anti-friction system not working properly.¹¹⁷³ Rather than conducting a second pier load test, Consumers Power chose to resolve the problem by reanalyzing the auxiliary building using a parametric study with 1/2-inch for the differential settlement.¹¹⁷⁴ On the basis of that analysis, Consumers Power has concluded that the

¹¹⁷² Mooney, Tr. 17356; Wheeler, Tr. 18910-11. See also Wells, Tr. 18646-18647; Mooney, Tr. 17181. Mr. Wells and Mr. Mooney testified that a QC inspector was temporarily suspended for retraining due to a violation of procedure in transferring information on the inspection record for the load test Carlson gauges.

¹¹⁷³ Mooney, Tr. 17162.

¹¹⁷⁴ Mooney, Tr. 17162-17163, 17170.

building could undergo that amount of differential settlement and yet not be structurally compromised.¹¹⁷⁵

419. We find that Consumers Power acted reasonably in dealing with the three concerns which arose relating to the Pier 11 West load test. These three incidents do not evidence poor management attitude or an unwillingness to communicate with the NRC. Rather, we find that Mr. Mooney and Mr. Wheeler were careful to inform the NRC Staff of matters of concern about which they had complete information. In addition, Applicant discovered these problems and responded quickly and appropriately to them.

5. EPA wings

420. Prior to starting the underpinning work, instrumentation was installed to monitor movements of the auxiliary building. During the time in which Consumers Power was attempting to obtain base line data, the readings indicated that the electrical penetration area ("EPA") of the auxiliary build-

¹¹⁷⁵ Id. See also Region III OSC Inspection Report 50-329/83-13 and 50-330/83-14, dated October 25, 1983, pp. 6-7. This inspection report indicates that the item concerning the pier load test "remains open pending the licensee's final design and a subsequent audit of the calculations and new remedial fixes." On September 14 and 15, 1983, the NRC and its consultants audited the revised calculations for the design adequacy of the auxiliary building reflecting the results of an underpinning pier load test. A recent Board notification from NRR states that additional information received by the NRC during this audit "calls into question the validity of the assumptions upon which the Staff's acceptance of the underpinning design was based." The information is presently being reviewed by NRR. See Board Notification Regarding Midland Auxiliary Building Underpinning (BN 83-174) from Thomas M. Novak, dated November 21, 1983.

ing was rising.¹¹⁷⁶ Dr. Landsman testified that the NRR staff and its consultants believed that the base line data recorded was accurate and attributed the recorded upward movement of the EPA to temperature variations between the inside and the outside of the building.¹¹⁷⁷ Mr. Mooney testified that while the EPA wings did appear to rise for a short period of time, the data trend has since reversed and the building has been performing as predicted.¹¹⁷⁸

I. S&W's assessment of underpinning work

421. In April 1983, S&W issued a report of the results of their independent assessment of the first 90 days of underpinning work at the Midland site.¹¹⁷⁹ S&W concluded that the underpinning work was performed in accordance with design intent and that the quality of the work was in keeping with the standards defined by Project documents. In addition, the S&W report indicates that soils MPQAD personnel have adequate qualifications, training, and ability. The MPQAD soils group is described as having a good understanding and appreciation of the intent and philosophy of QA and QC, and the implementation of inspection plans and reports is described as having been satisfactorily accomplished.¹¹⁸⁰

1176 Mooney, Tr. 17345-17347.
1177 Landsman, Tr. 14671-14674.
1178 Mooney, Tr. 17169.
1179 Consumers Power Exhibit No. 33.
1180 Id. at p. S-2.

422. We also make note of a report issued by the NRC Staff after these matters were considered in evidentiary hearings. By letter dated November 4, 1983, Mr. R. F. Warnick, Director of the Office of Special Cases, transmitted to this Board and the parties I & E report number 50-3291/83-24 (OSC); 50-330/83-25 (OSC) together with S&W weekly reports and minutes of a public meeting between the Staff, S&W personnel, and Consumers Power representatives. This report and the attachments discuss the overall status of the independent assessment of underpinning and remedial soils activities, as well as the Construction Implementative Overview activities.¹¹⁸¹ During the meeting which was the subject of the report, S&W summarized the independent assessment of underpinning and remedial soils work for the period September 20, 1982 through September 30, 1983. They reported the following conclusions:

- ° The underpinning that has been installed is of a very high quality.
- ° The Quality Assurance staff are performing as an effective quality organization.
- ° All of the organizations involved in the underpinning have demonstrated a positive attitude and concern towards quality.
- ° The instrumentation system installed to monitor building movements adds to the confidence in the success of the underpinning work.
- ° Both Consumers Power and Bechtel have been responsive to the requests and needs of the Assessment Team.

¹¹⁸¹ Letter from R. F. Warnick to J. W. Cook, dated November 4, 1983 and accompanying enclosures.

- ° Currently 14 of the 15 NIRs have been closed out. Seven of the NIRs were related to Specifications or Construction Procedures, six were related to QA Procedures, and two were hardware related.
- ° From time-to-time the Assessment Team has stated that the completions of underpinning piers, from excavation to load transfer, should be accomplished in a more timely manner. This item is still of concern to the Assessment Team, although some improvement has taken place and Quality has not been impacted. 1182

423. We make no findings regarding the substance of S&W's conclusions in this latter report. Nevertheless, we are aware of the fact that S&W appears to be performing its job as it should and that the third party review for soils appears thus far to be effective.

J. Conclusion

424. Based on the foregoing improvements in the remedial soils program, this Board finds that there is reasonable assurance that the remedial soils work will be carried out in such a manner that at the completion of construction all construction errors significant to safety will have been detected and corrected. Thus, we have reasonable assurance that the soils remedial work will be completed in accordance with design and regulatory requirements. In this regard, we place considerable reliance on Mr. Keppler's October 29, 1982 written testimony, in which he states:

Based upon (1) the third party assessments of the plant which will be performed, (2) the increased NRC inspection effort, and (3) the work authorization controls by the NRC, I believe that soils remedial work at the Midland plant may continue. 1183

We find that all of Mr. Keppler's conditions for continued soils work have been and continue to be met. For the present, we also find that, under the existing system of third party oversight backed up by NRC Staff inspection and the Work Authorization Procedure, Consumers Power is performing remedial soils work adequately. We do not find that either the soils QA program or its implementation is inadequate, but we do follow Mr. Keppler in believing that, at present, we cannot rely on the QA program alone to assure proper construction.¹¹⁸⁴ We acknowledge that at some future time, based upon satisfactory performance by Consumers Power, the Regional Administrator may relax these conditions by modifying or rescinding the third party overviews and the Work Authorization Procedure. It is also possible that, at some later time, we may be prepared to revise our finding regarding reliance on implementation of the QA program.

425. This record also includes extensive testimony dealing with other quality assurance implementation issues. We next examine these other issues primarily as background to our soils QA determination, especially insofar as they support inferences regarding management attitude and regarding the likelihood of proper completion of soils work.

1183 Keppler, October 29, 1982 prepared testimony with respect to quality assurance at p. 6, following Tr. 15111.

1184 See Id.; Keppler, March 25, 1983 prepared testimony with respect to quality assurance at pp. 5-6, following Tr. 15114.

III. THE DIESEL GENERATOR BUILDING INSPECTION

426. In the Fall of 1982, as a result of concerns regarding recertification of QC inspectors and other concerns, the Midland Section of the Region III Office of Special Cases considered whether a Staff-ordered shutdown of work at the Midland Plant was appropriate. Concluding that it lacked information sufficient to justify a shutdown in the balance of plant work, the Midland Section decided to conduct an intensive inspection of a portion of the non-soils related work.¹¹⁸⁵ Accordingly, NRC Region III inspectors conducted a special inspection of the diesel generator building (hereinafter called the "DGB Inspection") on October 12 - November 25, 1982, and January 19-21, 1983. The results of that inspection were issued in Report No. 50-329/82-22, 50-330/82-22, dated February 8, 1983. The findings of the DGB Inspection resulted in the issuance of Notice of Violation and Proposed Imposition of Civil Penalties EA83-3, dated February 8, 1983 ("NOV EA83-3").¹¹⁸⁶

427. NOV EA83-3 included two major findings related to the quality function at Midland. The first was the misuse by some QC inspectors of (now obsolete) inspection documents known as In Process Inspection Notices ("IPINs").¹¹⁸⁷ The

¹¹⁸⁵ Landsman, Tr. 14940; Gardner, Tr. 14934-14935; Shafer, Tr. 14931.

¹¹⁸⁶ Keppler, March 25, 1983 prepared testimony with respect to quality assurance, Attachments 3 and 4, following Tr. 15114.

¹¹⁸⁷ Wells, prepared testimony on quality assurance at pp. 9-13, following Tr. 18027.

second violation cited was for a list of miscellaneous items.¹¹⁸⁸
The NRC Staff considered the results of the DGB inspection to be evidence of a breakdown in the implementation of the quality assurance program.¹¹⁸⁹

428. In responses dated March 10, June 24, and July 12, 1983, Consumers Power admitted the violations cited in the February 8 NOV EA83-3.¹¹⁹⁰ In responding to the NOV EA83-3 items, Consumers Power identified the reasons for each violation and the corrective action proposed to address the specific violation and the generic or programmatic implication of the violation.¹¹⁹¹ We discuss the violations in more detail below.

A. NOV EA83-3 Item A - IPINS

429. With regard to the misuse of IPINs, NOV EA83-3 indicated that supervisory quality control personnel had directed quality control inspectors ("QCEs") to suspend in process inspections if too many nonconformances were discovered. Upon suspension, work was to be returned to construction for rework.

1188 See paragraphs 430, 438-448 infra.

1189 Keppler, March 25, 1983 prepared testimony with respect to quality assurance, Attachment 3 at p. 1, following Tr. 15114.

1190 B. Peck, prepared testimony, Attachment I, following Tr. 18921; Consumers Power Exhibits Nos. 49, 51. Two of the NOV EA83-3 items were only admitted in part. These were Items B-1.a and B-1.f.

1191 See Keppler, March 25, 1983 prepared testimony with respect to quality assurance, Attachment 3 at pp. 9-10 of Enclosure, following Tr. 15114; B. Peck, prepared testimony, Attachment, following Tr. 18921; Consumers Power Exhibits Nos. 49, 51. See also Shafer, Tr. 15012-15018.

In NOV EA83-3, the NRC Staff also indicated that follow up inspections on some IPINs were closed after reviewing only the deficiencies stated on the IPIN, thus creating the potential for a part of some inspections to be missed or not performed.¹¹⁹²

430. The inspectors advised Consumers Power Company of the preliminary results of the DGB Inspection in informal weekly exit meetings and in a formal NRC exit meeting on November 23, 1982.¹¹⁹³ Those meetings revealed the NRC's general concerns with IPINs.¹¹⁹⁴ The Staff's concerns at that time were two-fold: first, there was concern that because the IPIN did not serve the purpose of an NCR, i.e., it would not be picked up as a nonconforming item; secondly, there was concern that, under certain circumstances, a QCE would document deficiencies found on an IPIN, but terminate the inspection before completion and return the item to construction for re-work, and thus there may have been some deficiencies which were not recorded and trended.¹¹⁹⁵ The practice leading to the latter concern later became known as the "return option."

431. Consumers Power promptly took significant actions to alleviate the then recognized problems with IPINs. The return option was discontinued on site by the Project Field

¹¹⁹² Keppler, March 25, 1983 prepared testimony with respect to quality assurance, Attachment 3 at p. 2 of Enclosure and Attachment 7, following Tr. 15114; B. Peck, prepared testimony, Attachment 1, following Tr. 18921.

¹¹⁹³ Shafer, Tr. 15075; Wells, prepared testimony on quality assurance at pp. 9-10, following Tr. 18027.

¹¹⁹⁴ Wells, Tr. 18182.

¹¹⁹⁵ Wells, Tr. 18183-18184.

Quality Control Engineer, E. Smith, through a letter, dated November 19, 1982, sent to all QCEs.¹¹⁹⁶ This letter, in effect, mandated that QCEs complete all inspections once begun and that IPINs identify all deficiencies found, thus addressing the most prominent part of the Staff's then expressed concerns with IPINs.¹¹⁹⁷ Although an NRC inspector doubted that Mr. Smith's direction had been received by all persons on the field, the concern about incomplete inspections was as a practical matter eliminated by Consumers Power's halt of balance-of-plant safety-related work in December, 1982. Consumers Power communicated the work stoppage to the NRC Office of Special Cases on December 2, 1982.¹¹⁹⁸

432. James Meisenheimer terminated the use of IPINs in soils work by the issuance of a memorandum, dated December 13, 1982, thereby demonstrating that IPINs in the soils area were specifically addressed prior to January, 1983.¹¹⁹⁹ Prior to the issuance of the December 13th memorandum, Mr. Meisenheimer's group reviewed the use of IPINs in the soils area and did not find any problems in the way they had been utilized since the start of remedial soils work.¹²⁰⁰ Mr. Meisenheimer based his decision to discontinue IPINs on a

1196 Consumers Power Exhibit No. 36.

1197 Gardner, Tr. 16271-16272.

1198 Keppler, March 25, 1983 prepared testimony with respect to quality assurance at p. 4, following Tr. 15114.

1199 Consumers Power Exhibit No. 52; see also Consumers Power Exhibit No. 53.

1200 Meisenheimer, Tr. 19639-19640.

desire for conservatism; since there was no need for both the IPIN and NCR processes, and since there was concern over the use of IPINs in the balance of plant, he did not want to worry about the use of IPINs when remedial soils work recommenced later that month.¹²⁰¹

433. Only shortly before formal discussions of the DGB Inspection findings were held at the enforcement conference on January 18, 1983, did Consumers Power Company become aware of the Staff's specific concern that IPIN practices could result in missed inspections.¹²⁰² The identification of this IPIN issue as a special concern to the Staff occurred the day before the enforcement conference and was based upon a review of the DGB Inspection findings by senior I&E management.¹²⁰³ After the January 18 discussions, Mr. J. Cook directed Roy Wells to start an investigation to determine how IPINs were being used,¹²⁰⁴ and Mr. Wells formally terminated the use of IPINs for all non-soils related work on January 25, 1983.¹²⁰⁵

434. Mr. Wells specifically directed the IPIN task force to review QC inspection procedures (focusing on the IPIN process), to determine how inspectors had been implementing the procedures in practice, to determine what management instruc-

1201 Meisenheimer, Tr. 19697.

1202 Wells, prepared testimony on quality assurance at pp. 9-10, following Tr. 18027.

1203 J. Cook, Tr. 18273.

1204 Wells, prepared testimony on quality assurance at p. 11, following Tr. 18027.

1205 Id. at pp. 12-13; Consumers Power Exhibit No. 38.

tions had been issued regarding the use of IPINs, and to summarize the effects that the use of IPINs had or may have had on the integrity of the inspection process.¹²⁰⁶ (The task force's findings are fully described in Consumers Power's response to NOV EAB3-3.¹²⁰⁷)

435. The task force determined that the return option was a process in which, if a QCE conducting an initial inspection determined that parts or components covered by a given inspection activity had a large number of nonconforming conditions, the QCE had the option of terminating the inspection before completing the activity and returning the hardware to construction for rework after all observed deficiencies were documented on an IPIN. The task force concluded that the return option, by itself, would not have resulted in a missed inspection, so long as the QCE engaged in closing out the Inspection Record ("IR") followed the written procedure by satisfying himself that all items included in the activity, but not encompassed by the IPIN, were in fact inspected (either personally or by the QCE originating the IPIN). Some QCE's (not more than 10% of those the task force contacted) lacked a full understanding of the requirement to satisfy themselves that all items on an activity had been fully inspected before closing that IR activity with an IPIN.¹²⁰⁸ This misunderstand-

¹²⁰⁶ Id. at pp. 11-12.

¹²⁰⁷ See B. Peck, prepared testimony, Attachment 1, following Tr. 18921.

¹²⁰⁸ B. Peck, prepared testimony, Attachment 1 at pp. A1-7, following Tr. 18921.

ing may have been induced in part by the fact that the IPIN procedures failed to specify how the return option should be handled, either initially or in closing out IR activities.¹²⁰⁹

436. As a result of the task force's findings, Consumers Power Company committed to extensive corrective actions. All QCEs will now be explicitly instructed in this recertification training to complete all inspections and document all conditions observed on NCRs. Consumers will also perform a 100% verification of all past QC inspections which involved an IPIN, regardless of whether or how the IPIN was dispositioned.¹²¹⁰

437. In May, 1983, Consumers Power Company directed its effort at resolving the Staff's specific concerns with past IPINs to the soils area. Soils QA personnel questioned all soils QCEs remaining on site concerning the use of the return option. They determined that even though some QCEs had used the return option, the practice of soils QCEs had been to perform a 100% reinspection of the inspection attribute after an IPIN had been generated.¹²¹¹ QA in any event performed a 100% reinspection of IRs with IPINs (where attributes were accessible). Because a large majority of soils work has been subject to QA overinspection,¹²¹² the NRC has allowed Consumers Power to take credit for reinspection where there has been a

1209 See Id. at p. A1-1.

1210 Wells, prepared testimony on quality assurance at pp. 12-13, following Tr. 18027.

1211 Meisenheimer, Tr. 19645.

1212 Meisenheimer, Tr. 19696.

100% QA overinspection and the records show that all of the work was overinspected and completed.¹²¹³ As a result of these efforts, Consumers Power Company has determined that there was no work relating to soils in which IPINs were misused such that a partial inspection was done and the reinspection missed inspecting some activities not encompassed by the IPIN.¹²¹⁴

B. NOV EA83-3 Item B - Other
DGB Inspection Findings

438. Bruce Peck and Walter Bird of Consumers Power presented testimony concerning Consumers Power's response to Item B of the NOV. A panel of NRC staff witnesses also testified concerning the miscellaneous items of the DGB inspection. However, the NRC Staff at the time when they testified had not yet finalized their response to the Applicant's response to NOV EA83-3.¹²¹⁵

439. Since Consumers Power admitted fully all but two examples of the violations cited in Item B of the NOV, many of these issues were not explored at all on cross-examination. However, certain of the issues were discussed in detail. These items include the following: 1) the 16,000 inspection backlog, 2) the DGB exhaust system, 3) Armor stone for the perimeter dike, and 4) the use of field change notices ("FCNs") and field change requests ("FCRs") in place of the use of nonconformance reports ("NCRs").

1213 Meisenheimer, Tr. 19703.

1214 Meisenheimer, Tr. 19654.

1215 Gardner and Shafer, Tr. 14399-14400.

1. Inspection backlog

440. In the cover letter to NOV EA83-3, Mr. Keppler referred to a backlog of almost 16,000 inspections. The letter indicated that this backlog resulted from management not scheduling inspections in a timely and efficient manner.¹²¹⁶

441. In response to the Staff's concern about the backlog of inspections, Consumers Power reviewed the status of inspection records. The results of this review were documented in Consumers Power's response to NOV EA83-3.¹²¹⁷ The review disclosed that approximately 16,000 inspection records remained open, but only in about 1,200 of these cases was work ready for further inspection. Therefore, the actual backlog of uncompleted inspections was 1,200.¹²¹⁸ Mr. Bird testified that this analysis of the open inspection records would probably not have been available to the Staff prior to the submittal of the NOV EA83-3 response.¹²¹⁹ Moreover, Mr. Bird testified that he did not consider the actual backlog of 1,200 inspections to be unusual.¹²²⁰ Staff testimony did not dispute this conclusion.

2. DGB exhaust muffler system

442. Item B-2.a of NOV EA83-3 cited Consumers Power for failure to indicate material identity of the installed

¹²¹⁶ Keppler, March 25, 1983 prepared testimony with respect to quality assurance, Attachment 3 at p. 1. following Tr. 15114.

¹²¹⁷ B. Peck, prepared testimony, Attachment I at p. A2-3, following Tr. 18921.

¹²¹⁸ Id.

¹²¹⁹ Bird, Tr. 19046-19047. See also Bird, Tr. 19058-19059.

¹²²⁰ Bird, Tr. 19019.

muffler saddle supports and plates for the DG exhaust system in design drawings and specifications.¹²²¹ In its March 10, 1983 response to this item, Consumers Power stated that the nonconforming condition was indeterminate and that further information was being requested from the vendors.¹²²² In its June 24, 1983 response, Consumers Power stated that new information had just been received from the vendor and was being evaluated.¹²²³ On July 12, 1983, the Applicant admitted this violation and explained the reasons for the violation and the corrective action which was planned.¹²²⁴

443. Mr. R. Cook stated that he and other members of the NRC believed the first response to item B-2.a was inappropriate because they were of the opinion that adequate information was available to Consumers Power to respond fully in the March 10, 1983 letter.¹²²⁵ Mr. Peck explained that the delay in responding to this item of concern resulted from the fact that Consumers Power had to research the documentation of two levels of subsuppliers in order to develop its response.¹²²⁶

1221 Keppler, March 25, 1983 prepared testimony with respect to quality assurance, Enclosure to Attachment 3 at p. 5, following Tr. 15114.

1222 B. Peck, prepared testimony, Attachment 1 at p. A2-19, following Tr. 18921.

1223 Consumers Power Exhibit No. 49, Attachment 1 at p. 4.

1224 Consumers Power Exhibit No. 51, Attachment 1.

1225 R. Cook, Tr. 19505.

1226 B. Peck, Tr. 19560-19561.

444. Mr. R. Cook also expressed concern about the adequacy of the specifications for the DG exhaust muffler saddle supports and plates which were supplied by Bechtel to the vendor, TransAmerica DeLaval, Inc. ("TDI"). In response to questioning from counsel for the NRC, Mr. R. Cook stated that he did not perform a complete review of all the information which Bechtel supplied to TDI in ordering this material. Therefore, he was unable to conclude whether or not Bechtel provided TDI with sufficient information so that, if TDI had performed properly, the right materials would have been provided.¹²²⁷ Later, Mr. R. Cook testified that Bechtel's failure to specify to TDI that the components were to be subject to the QA requirements of 10 CFR Part 50, Appendix B, contributed to the problem.¹²²⁸ However, Mr. R. Cook was unaware of the QA specifications which were supplied to TDI by Bechtel.¹²²⁹ In addition, Mr. R. Cook was unwilling to testify that the procurement procedure used by Bechtel was deficient,¹²³⁰ and he agreed that the specifications supplied by Bechtel included all of the codes and standards which would be applicable to seismic Category I components of the DG exhaust silencer system.¹²³¹

445. Consumers Power admitted the violation stated in Item B-2.a and explained that the violation was the result of a

1227 R. Cook, Tr. 19503-19505.

1228 R. Cook, Tr. 19530.

1229 R. Cook, Tr. 19553; see B. Peck, Tr. 19573-19574.

1230 R. Cook, Tr. 19530.

1231 R. Cook, Tr. 19532-19533.

failure by TDI to properly implement design intent and a failure by Bechtel project engineering to properly recognize and correct the problem.¹²³² Because Bechtel lacked the expertise to design and construct a DG system, a performance oriented specification was used to procure the DG system from TDI.¹²³³ The procurement documents included performance specifications which specified that QA requirements applied to all components and assemblies of the DG system which affected the reliability and ability of the equipment to perform its design function. The package of procurement documents also included the codes, standards, and QA requirements which TDI was to follow for such components and assemblies.¹²³⁴ The specifications required that TDI submit a list of the components and assemblies it considered to be Q to Bechtel project engineering for review.¹²³⁵ TDI failed to classify the muffle saddle supports and plates as Q, and project engineering failed to properly review the list of Q items proposed by TDI which would have revealed this error.¹²³⁶ Consumers Power acknowledged that it was ultimately responsible to the NRC for these errors.¹²³⁷

1232 Consumers Power Exhibit No. 51 Attachment 1 at p. 2; B. Peck, Tr. 19558-19559.

1233 B. Peck, Tr. 19566; Consumers Power Exhibit No. 51.

1234 Consumers Power Exhibit No. 51 Attachment 1 at pp. 2-3; B. Peck, Tr. 19566, 19573-19574, 19470-19471. See also R. Cook, Tr. 19532-19533.

1235 Consumers Power Exhibit No. 51 Attachment 1 at p. 2; B. Peck, Tr. 19471-19472.

1236 Consumers Power Exhibit No. 51 Attachment 1 at pp. 2-3; B. Peck, Tr. 19558-19559.

1237 B. Peck, Tr. 19479-19480, 19483, 19559.

446. As part of the response to this NOV EA83-3 Item, Consumers Power stated that Bechtel project engineering was investigating to determine whether TDI had failed to specify other components as Q which should have been Q. For all performance-oriented procurements, a review is being done to verify that safety related items were designated as such by the vendors in accordance with design requirements.¹²³⁸ In addition, all rework necessary as a result of this NOV EA83-3 finding will be done.¹²³⁹

3. Armor Stone

447. Item B-2.f of NOV EA83-3 charged that the Armor Stone for a Q portion of the perimeter dike was purchased without quality controls.¹²⁴⁰ Dr. Landsman expressed concern that placement of non-Q Armor Stone could impair the integrity of the dike and impact the ultimate heat sink.¹²⁴¹ Consumers Power admitted this violation and determined that it was the result of failure to translate NRC requirements into design and procurement documents. Consumers Power proposed to revise the applicable specifications and drawings to ensure that the total area of the dike adjacent to the ultimate heat is designated Q

¹²³⁸ Consumers Power Exhibit No. 51 Attachment 1 at pp. 3-4; B. Peck, Tr. 19461-19464, 19475-19476.

¹²³⁹ Consumers Power Exhibit No. 51 Attachment 1 at pp. 3-4; B. Peck, Tr. 19480-19482.

¹²⁴⁰ B. Peck, prepared testimony, Attachment I at p. A2-26, following Tr. 18921.

¹²⁴¹ Landsman, Tr. 15823-15824.

and that installation of Armor Stone in that area will be performed in conformance to Q requirements.¹²⁴²

4. Use of FCNs and FCRs

448. Consumers Power's supplemental response to Item B-4.a of NOV EA83-3 prompted a number of questions concerning the proper use of field change notices ("FCNs") and field change requests ("FCRs").¹²⁴³ Witnesses for Consumers Power testified that whenever a nonconforming condition exists after an installation is completed, a noncompliance report ("NCR") must be written. FCNs and FCRs are used as a means of accepting work as-is. Before an installation is completed, an FCR or FCN can be written to modify the design documents without an NCR being required. Once construction is completed, if there is a nonconforming condition, then an NCR must be written, even if it is eventually dispositioned to "use as-is." An FCN or FCR may then also be written to document the decision to use as-is and to close out the NCR.¹²⁴⁴

C. Conclusions

449. There has been evidence presented that there was a breakdown in QA implementation in connection with the DGB

¹²⁴² B. Peck, prepared testimony, Attachment I at p. A2-26, following Tr. 18921.

¹²⁴³ Consumers Power Exhibit No. 49; B. Peck and Bird, Tr. 18976-18985.

¹²⁴⁴ B. Peck and Bird, Tr. 18976-18985. See also, Wells and Rutgers, Tr. 18635-18641.

Inspection. For our purposes, the DGB findings are relevant only to the extent to which they may reflect programmatic difficulties which may also exist in the soils area. In this regard, we note that the new corrective actions proposed by Consumers Power (discussed in the next section of these findings) appear adequate to resolve both the specific and the generic and programmatic concerns raised. The Board further finds that Consumers Power's actions in response to the findings of the DGB inspection, including the initiation of the Construction Completion Program discussed at paragraphs 461 to 503 infra, demonstrate a proper concern for quality assurance on the part of Consumers Power's management. Finally, Consumers Power Company demonstrated responsiveness to NRC Staff concerns by thoroughly investigating the NOV EA83-3 findings to determine the causes of the violations and by responding with comprehensive proposals for corrective action.

IV. IMPROVEMENTS IN BALANCE OF PLANT CONSTRUCTION AND QUALITY ASSURANCE ORGANIZATION

A. Introduction

450. The DGB Inspection was but one of several major developments which pointed to the need for fundamental changes in the construction and quality assurance organizations for balance of plant work being performed under the direction of Bechtel. A comprehensive plan for the completion of safety related balance of plant work known as the Construction Completion Program ("CCP") evolved from the responses of Consumers Power and the NRC Staff to the balance of plant problems which accumulated during 1982.¹²⁴⁵ Before the DGB Inspection, however, there were less comprehensive efforts at improvement directed specifically to QA/QC organization and implementation. These efforts resulted in significant personnel changes and reorganizations which were ultimately incorporated into the CCP. Nevertheless, because of the importance of the QA and QC changes, and because of their relation to specific findings relating to QA organization and personnel from the earlier hearings, we develop these separately.

B. Changes in the QA/QC Program and Implementation

1. Integration of QC into MPQAD

451. In the September 17, 1982 letter (Serial No. 18850) related to balance of plant work, the Applicant proposed

¹²⁴⁵ J. Cook, Tr. 18298-18300. See also J. Cook, April 11, 1983 prepared testimony on quality assurance at p. 4, following Tr. 18025.

assuming the responsibility for directing balance of plant QC functions from Bechtel (in addition to those already assumed for soils and HVAC) by placing the QC function under the direct supervision of MPQAD and by integrating inspection resources of both Bechtel and Consumers Power. This change was implemented on January 17, 1983.¹²⁴⁶ The Staff viewed the assumption by Consumers Power of the QC functions of Bechtel for the balance of plant as a positive factor in ensuring an improvement in QA program implementation.¹²⁴⁷ The Staff also considered the fact that Consumers Power promptly accepted the Staff's recommendation and that the NRC Staff did not have to order the remedial action, a positive factor.¹²⁴⁸

2. MPQAD top management personnel changes

452. In October of 1982, Roy Wells assumed responsibility as the Executive Manager, MPQAD. He is located at the site, and MPQAD is his sole responsibility. He reports directly to Mr. J. Cook. The appointment of Mr. Wells took place concur-

¹²⁴⁶ Wells, prepared testimony on quality assurance at p. 5, following Tr. 18027. Consumers Power Exhibit No. 46 illustrates the current organization of MPQAD.

The September 17, 1982 letter (Serial No. 18850) also discussed a proposed Independent Design and Construction Verification ("IDCV") which was an expanded approach for assessing the design quality of the project. The IDCV will be discussed infra at paragraphs 493-497.

¹²⁴⁷ Keppler, Tr. 15579.

¹²⁴⁸ Keppler, Tr. 15657-15661.

rently with other changes in the QA organization and was reported to this Board via a letter dated November 5, 1982.¹²⁴⁹

453. Mr. J. Cook selected Mr. Wells for the position of Executive Manager, MPQAD, based on Mr. Wells' performance record as a manager. The tasks of coordinating the various QA departments and dealing with the NRC Staff necessitated superior administrative and managerial skills. Mr. J. Cook, after making this assessment and prior to appointing Mr. Wells, discussed his proposal with Messrs. Shafer, Keppler and Warnick. Mr. J. Cook stated he would not make the assignment if the NRC Staff could not be supportive. In response, Messrs. Shafer, Keppler and Warnick agreed to give Mr. Wells a chance and judge him by his subsequent performance.¹²⁵⁰

¹²⁴⁹ Wells, prepared testimony on quality assurance at pp. 2-3, following Tr. 18027.

¹²⁵⁰ J. Cook, Tr. 18699-18700.

Dr. Landsman expressed some concern regarding the lack of QA experience of certain MPQAD supervisory personnel, including Mr. Wells. The question of Mr. Meiseinheimer's qualifications is addressed supra at paragraph 375. These concerns represented the personal opinion of Dr. Landsman and are not the Staff's official position. The Staff's position on this issue is that there are no regulatory requirements specifying the level of quality experience necessary; therefore, the Staff will monitor commitments made by MPQAD management until it is satisfied with their performance. R. Cook, Landsman, Gardner and Shafer, October 29, 1982 prepared testimony with respect to quality assurance at p. 2, following Tr. 11344; R. Cook, Gardner, Landsman and Shafer, March 25, 1983 prepared testimony with respect to quality assurance at pp. 3-5, following Tr. 14374.

Mr. Wells testified as to his qualifications and pointed out that his limited QA background is amply supplemented by his assistant, Mr. Curland, who has 20 years of QA experience. Wells, Tr. 18197-18199. When questioned specifically on whether Mr. Wells was qualified to serve as Executive Manager, MPQAD, the opinions of various Staff members were as

454. At the time balance-of-plant QC functions were incorporated under MPQAD, the Applicant sought to fill the supervisory positions with the most qualified personnel. The NRC Staff had expressed concern over having Bechtel QC inspectors reporting to Bechtel supervisors.¹²⁵¹ Mr. Wells was aware of the Staff's concern but felt that, at the time, he had the best people for the job. If the organization did not operate

(Footnote 1250 continued from page 305)

follows: Mr. Shafer -- the head of the Midland Office of Special Cases -- thought Mr. Wells was qualified; Mr. R. Cook thought Mr. Wells was qualified as long as the counsel of people more experienced in QA was available; Mr. Gardner agreed with Mr. Shafer as long as Mr. Wells performed in an adequate manner. R. Cook, Gardner, Shafer, Tr. 16448-16450. The Staff views Mr. Wells assuming this position as a positive addition in insuring that the QA program at Midland will be implemented in accordance with regulatory requirements. Keppler, Tr. 15577-15579.

NRC Staff also addressed incidents of concern involving Mr. Wells which have occurred since his appointment as Executive Manager of MPQAD. One such event involved the Staff's concern that the training and recertification of QC inspectors was being conducted at too fast a pace. Gardner, Tr. 16686-16689; see also paragraph 454 infra. The Staff also voiced some concern over whether Consumers Power had agreed to perform a 100% reinspection of any inspector who failed a programmatic exam. Mr. Wells stated there was a misunderstanding in this area which was the result of his not having been at the September 1982 meeting when the issue was discussed. That meeting was prior in time to his taking over as Executive Manager of MPQAD. Wells, Tr. 18173-18176. A third item addressed by the Staff witnesses was Mr. Wells' handling of the problems with In Process Inspection Notices (IPINs). This matter is discussed in paragraphs 429-437 supra. The fourth item addressed by the Staff witnesses was a change, initiated by Mr. Wells for the purpose of clarification, to a quality trend graph which resulted in the deletion of an annotation which stated that Bechtel QC and Bechtel construction had an agreement not to write IPINs. Shafer, Tr. 16255-16256. The NRC concluded that there was no intent on the part of MPQAD management to deceive the NRC Staff or to confuse the IPIN issue by changing a quality record. Staff Exhibit No. 18 - Inspection Summary at p. 3; Shafer, Tr. 15961; Wells, Tr. 18184.

¹²⁵¹ R. Cook and Shafer, Tr. 16301-16302.

to his satisfaction, he would then take steps to remove people. The Staff found Mr. Wells' approach to be acceptable at the time of hearing.¹²⁵² We agree.

3. Retraining and recertification of QC inspectors

455. As discussed in paragraph 390 supra, the recertification program for QC personnel was extended beyond soils to balance of plant. Dr. Landsman and Mr. Gardner testified that they have continued to monitor the training and recertification of QC inspectors.¹²⁵³ The NRC expressed concern that training was proceeding too fast in the first quarter of 1983, resulting in unprepared instructors and trainees' questions not being adequately answered.¹²⁵⁴ Consumers Power was also aware of these problems and initiated a slow-down in the pace of training which coincided with the NRC Staff's review of this situation. In the early part of March, 1983, a training supervisor suggested to Mr. Wells that training be suspended for one week.¹²⁵⁵ Although some disagreement may exist as to the reason behind the initial suspension of training for the one-week period, the Staff did give credit to Applicant for acknowledging the problem, suspending the training program and taking

¹²⁵² Keppler, Tr. 15616.

¹²⁵³ R. Cook, Gardner, Landsman and Shafer, March 25, 1983 prepared testimony with respect to quality assurance at p. 2, following Tr. 14374.

¹²⁵⁴ Id. at pp. 2-3.

¹²⁵⁵ Wells, Tr. 18195-18197.

steps to improve it.¹²⁵⁶ Applicant was also credited with making the determination to suspend training for a longer period of time after the initial one-week suspension in order to revise the PQCI's to which the QC inspectors were being certified.¹²⁵⁷ Dr. Landsman and Mr. Gardner found no significant problems with any other portion of the retraining and recertification program.¹²⁵⁸

456. On January 10, 1983, Mr. J. Cook sent a letter to Region III regarding the Construction Completion Program. Attached to that letter was a document detailing the proposed CCP. Section 3.0 set forth the QA/QC organization changes outlined above and described the recertification process for QC inspectors which had been revised to include commitments made during the September 29, 1982 meeting. The recertification process, originally scheduled for completion on April 1, 1983, embodied certification to Project Quality Control Instructions ("PQCIs") which the inspectors were required to implement and training and examination in accordance with MPQAD Procedure B-3M-1.¹²⁵⁹ MPQAD Procedure B-3M-1 was written to provide

1256 R. Cook, Gardner, Landsman and Shafer, March 25, 1983 prepared testimony with respect to quality assurance at pp. 2-3, following Tr. 14374.

1257 Gardner, Tr. 16257.

1258 R. Cook, Gardner, Landsman and Shafer, March 25, 1983 prepared testimony with respect to quality assurance at p. 3, following Tr. 14374.

1259 Keppler, March 25, 1983 prepared testimony with respect to quality assurance, Attachment 6 at p. 7, following Tr. 15114.

Consumers Power's commitment to Reg. Guide 158.1 which endorses ANSI N45.2.6, 1978.¹²⁶⁰

457. Applicant did not complete recertification of all QC inspectors by April 1, 1983 for several reasons. Under the CCP, PQCIs are being reviewed and revised as necessary in order to put them into a consistent format and to have specifications clearly set out.¹²⁶¹ On March 7, 1983, Consumers Power suspended training to PQCIs until the PQCIs had been reviewed and revised. After the review and revision process, the PQCIs were to be used as part of the training for QC inspectors.¹²⁶² Consumers Power QA engineers are responsible for reviewing and approving the PQCIs. The entire process is subject to review by the NRC Staff. Dr. Landsman testified that he believed the evaluations of PQCIs being undertaken by the QA engineers were adequate.¹²⁶³ He further testified that in the case of a PQCI which is revised after training has taken place, a determination will be made as to whether training and recertification is necessary.¹²⁶⁴

458. Other factors contributing to the slower than planned recertification were the work shutdown following the DGB inspection and an influx of new inspection personnel for expanded inspections. Regardless of the date of completion of

1260 Bird, Tr. 16981, 17002; Shafer, Tr. 16865.

1261 Wells, Tr. 18658.

1262 Gardner, Tr. 16794-16795.

1263 Id.; Landsman, Tr. 16873.

1264 Landsman, Tr. 16794-16795.

recertification, no QC inspectors will do an inspection or reinspection until after recertification.¹²⁶⁵

459. The Board finds that the recertification program for QC inspectors is being properly implemented. Further, Consumers Power has shown initiative in this area and has also been responsive to NRC Staff concerns. The Board has confidence that the reorganized MPQAD organization can effectively retrain and recertify QC inspectors and train and certify new QC inspection personnel. The NRC Staff's continuing attention to this matter provides further assurance that QC inspection personnel at the site will be properly qualified both as to general QC requirements and as to specific PQCI's.

4. Phase 4 Trend Program

460. When we heard testimony in the summer of 1983, Consumers Power was in the process of making changes to the trending program which were intended to culminate in the Phase 4 trend analysis.¹²⁶⁶ The purpose of these changes was to develop a more statistically sound trend analysis which would be responsive to NRC Staff concerns, the self initiated evaluation findings, and the biennial audit results. Phase 4 was being designed to detect changes in the rates of nonconformances in selected performance areas and for selected nonconforming categories. Data from inspections will be used to generate weekly trend graphs which will display percent defective curves

1265 Wells, Tr. 18671-18672.

1266 Bird, prepared testimony on quality assurance at p. 6, following Tr. 16975; Tr. 19184-19185.

and to calculate control limits. In this manner, the Phase 4 program is intended to serve as a near real time indicator of problem areas requiring attention and to provide useful information for determination of root cause and generation of corrective action.¹²⁶⁷ Use of a computer to process the data will result in faster detection of problem areas.¹²⁶⁸ Reports generated under the Phase 4 program will be provided weekly to QA organizations and the line organizations and monthly to management.¹²⁶⁹

C. The Construction Completion Program

461. The CCP is a composite of several tentative programs developed by Consumers Power in response to developments during 1980. It appears to us that the formal program for the CCP developed principally after the results of the Diesel Generator Buiding ("DGB") Inspection became substantially known to Consumers Power, although it incorporated some measures which Consumers Power had previously committed to as a result of earlier interactions with the Region III Staff and other measures which Consumers Power believed were essential to successful completion of the plant.

462. There appear to have been three almost independent chains of events leading up to the creation of the CCP.

¹²⁶⁷ Bird, prepared testimony on quality assurance at p. 6-7, following Tr. 16975; Bird, Tr. 19186-19187, 19189, 19191-19192.

¹²⁶⁸ Bird, Tr. 19212-19213.

¹²⁶⁹ Bird, Tr. 19190.

The first chain developed out of Consumers Power's initial response to the Staff's SALP II report. Mr. Keppler, the Regional Administrator, testified in substance that, because of the continued lack of progress in the quality area and because of the Applicant's originally argumentative response (later withdrawn) to the SALP II evaluation, Region III and NRR consulted during the summer of 1982 about possible measures that could be developed to deal with the Midland Project.¹²⁷⁰

463. At a July 26, 1982 meeting with NRR, Mr. Keppler, some members of the Region III Staff, and NRR recommended seeking commitments from Consumers Power (1) to an independent design review, and (2) to independent third party monitoring of QA implementation.¹²⁷¹ Later, however, Mr. Warnick and members of the Office of Special Cases ("OSC") indicated that the real causes of the problems at Midland were unknown and therefore the proposed cure was too specific.¹²⁷² The Midland Section of the OSC produced its own different set of recommendations. These included increased inspection, independent "vertical slice" review of a safety related system, and having QC report to Consumers Power instead of to Bechtel.¹²⁷³ However, Darrell

¹²⁷⁰ Keppler, Tr. 15164-15166. See also paragraphs 539-545 infra.

¹²⁷¹ Keppler, Tr. 15165-15166; Keppler, October 29, 1982 prepared testimony with respect to quality assurance, Attachment D, Enclosure 3, following Tr. 15111.

¹²⁷² Keppler, Tr. 15166-15167; Keppler, October 29, 1982 prepared testimony with respect to quality assurance, Attachment D, following Tr. 15111.

¹²⁷³ Keppler, October 29, 1982 prepared testimony with respect to quality assurance, Attachment D, Enclosure 4, following Tr. 15111.

Eisenhut, Director of Licensing for NRR, was not completely satisfied with the Midland Section's recommendations either.¹²⁷⁴ Mr. Keppler testified that he did not at that time adopt any particular set of recommendations as his own position because he had not been able to identify the cause of problems at Midland.¹²⁷⁵ In fact, Mr. Keppler formed the Midland Section of the Office of Special Cases precisely because he did not know what was not working properly at the site.¹²⁷⁶

464. Mr. Keppler did, however, have a meeting with Messrs. Selby and J. Cook of Consumers Power and Messrs. Eisenhut and Novak from NRR on August 26, 1982.¹²⁷⁷ Mr. Keppler, at that meeting, paraphrased the various recommendations which had been made by the Midland Section and NRR.¹²⁷⁸ These included an independent design review and independent third party monitoring of site QA functioning, augmented NRC inspection, moving the QC function from Bechtel's control to Consumers Power's control, and other miscellaneous suggestions.¹²⁷⁹ This meeting was the first mention of a new program to Consumers Power.¹²⁸⁰

1274 Keppler, Tr. 15178.

1275 Id.

1276 Landsman, Tr. 14820-14821.

1277 See paragraph 377 supra and sources there cited.

1278 Id.; Keppler, Tr. 15178.

1279 Keppler, October 29, 1982 prepared testimony with respect to quality assurance, Attachment C and Attachment D at Enclosures 3 and 4, following Tr. 15111.

1280 Keppler, Tr. 15178-15179.

At this meeting, Mr. Keppler told Consumers Power that it should come up with a program on its own initiative.¹²⁸¹ He did not specify required details of such a program, but left it to Consumers Power to develop its own alternatives.¹²⁸²

465. Consumers Power presented a proposal for a program at a subsequent meeting on September 2, 1982 in a draft letter which reflected in a general way some of the NRC recommendations, but which Mr. Keppler and the Staff considered to be lacking in specificity in a number of areas.¹²⁸³ The Staff reviewed the drafts Consumers Power submitted at the September 2, 1982 meeting, suggested changes, and indicated the need for more detail.¹²⁸⁴ The Consumers Power's draft letters were intended in part to meet the previously expressed Staff concerns.¹²⁸⁵ Mr. Keppler indicated that he would have been concerned had Consumers Power not come up with a response to the serious concerns expressed by the Staff in August,¹²⁸⁶ and we conclude that Consumers Power made timely and diligent efforts to respond to the Staff concerns. The dialogue between Consumers Power and the Staff culminated in the letters of September 17, 1982.¹²⁸⁷

1281 Keppler, Tr. 15190.
1282 Keppler, Tr. 15205-15207.
1283 Keppler, Tr. 15202-15203.
1284 Keppler, Tr. 15213.
1285 Keppler, Tr. 15217-15219; Stamiris Exhibit No. 65 at
p. 1.
1286 Keppler, Tr. 15212.
1287 See paragraph 378 supra.

466. In the September 17 letter (Serial No. 18550), Consumers Power proposed to take over the quality control function for balance of plant and integrate it into MPQAD, to conduct reviews of the "vertical slice" type and of the broad "horizontal" type using the guidelines of the Institute of Nuclear Power Operations.¹²⁸⁸ While this review was broader than what the industry standard required at the time,¹²⁸⁹ it did not fully satisfy the Staff.¹²⁹⁰ The Construction Implementation Overview and the Independent Design and Construction Verification Plan eventually replaced these proposals.¹²⁹¹

467. The second major chain of events leading to the creation of the CCP revolved around construction problems leading to the Applicant's realization that, even aside from regulatory problems, the Project was not making satisfactory progress with construction and system turnovers.¹²⁹² Mr. J. Cook testified that this analysis of project progress was the second most important event leading up to the CCP.¹²⁹³ Project management began internally discussing the possibility of organizing con-

¹²⁸⁸ J. Cook, April 11, 1983 prepared testimony on quality assurance, Attachment 2 at pp. 1-2, following Tr. 18025. Consumers Power had already decided to integrate the soils QC function into MPQAD. See paragraphs 378, 389-390 supra.

¹²⁸⁹ J. Cook, April 11, 1983 prepared testimony on quality assurance at pp. 3, 18, following Tr. 18025.

¹²⁹⁰ Keppler, Tr. 15254-15256.

¹²⁹¹ See paragraphs 492-503 infra.

¹²⁹² J. Cook, April 11, 1983 prepared testimony on quality assurance at pp. 3-4, following Tr. 18025.

¹²⁹³ Id.; J. Cook, Tr. 18287.

struction forces into "teams" as a result of these problems in September, 1982. The team concept was derived from use of a similar concept at the WPPS-2 plant for completion of construction.¹²⁹⁴ WPPS-2 personnel visited Midland and later, sometime in November, Midland personnel visited WPPS-2.¹²⁹⁵ Consumers Power and Bec. management continued to study the team concept during the time the NRC inspectors were conducting the DGB Inspection. The final decision to adopt the team concept was made around Thanksgiving after the November 23 DGB Inspection exit meeting.¹²⁹⁶

468. The third, and most important, major factor influencing the decision to institute the CCP was the DGB Inspection. On November 10, 1982, after conducting the initial portion of the DGB Inspection, members of the NRC Midland section team, Messrs. Burgess, R. Cook, Landsman, Gardner and Shafer, met to discuss their findings.¹²⁹⁷ As a result of the initial DGB Inspection findings, the inspectors considered at that meeting the need for shutting down all safety related work.¹²⁹⁸ Mr. Gardner testified that he believed the NRC Staff inspection team was "unanimous" that they had evidence which would allow them to recommend a shutdown.¹²⁹⁹ Mr. Warnick was

¹²⁹⁴ J. Cook, Tr. 18298-. J. Cook, April 11, 1983 prepared testimony on quality assurance at p. 3, following Tr. 18025.

¹²⁹⁵ J. Cook, Tr. 18298-18299.

¹²⁹⁶ J. Cook, Tr. 18300-18301.

¹²⁹⁷ Shafer, Tr. 15066-15067.

¹²⁹⁸ Shafer, Tr. 15068-15069.

¹²⁹⁹ Gardner, Tr. 15071.

aware that the Midland Section wanted to stop work, and he conveyed this information to Mr. Keppler.¹³⁰⁰ Throughout the period of the DGB Inspection, the NRC inspection team had weekly "exit" meetings with representatives of Consumers Power at which they discussed problems found during the inspection. The final exit meeting of the first phase of the Inspection on November 23, 1982, was the subject of extensive testimony. At this meeting that the Staff informed Consumers Power that they were going to recommend escalated enforcement action and that there was considerable sentiment within the Midland NRC team for stopping all work.¹³⁰¹ However, the NRC Staff members did not indicate that they had irrevocably decided to recommend issuance of a stop work order,¹³⁰² and the Staff sought to allow Consumers Power to recognize the problems found in the DGB Inspection and to take appropriate steps to solve those problems.¹³⁰³ Consumers Power shut down most safety related work at the site well before the Staff issued its draft report.¹³⁰⁴

469. Consumers Power generally agreed with the approach suggested by the Staff at the November 23, 1982 meeting. Consumers Power recognized the magnitude of the problems revealed by the DGB Inspection and realized that it needed to

1300 Shafer and Gardner, Tr. 15072; Keppler, Tr. 15543, 15304.

1301 Shafer and Gardner, Tr. 15079-15080; J. Cook, Tr. 18746-18748.

1302 B. Peck, Tr. 18929.

1303 B. Peck, Tr. 18929-A.

1304 Shafer, Tr. 15074; note 1310 infra.

consider stopping work at the site.¹³⁰⁵ Consumers Power at that meeting outlined a plan which it was already developing which would also attempt to deal with the problems revealed by the DGB Inspection.¹³⁰⁶ The NRC indicated that it would be desirable for Consumers Power to complete the details of this plan so as to address the findings of the DGB Inspection by December 7, 1982 in order to assist Region III in a scheduled meeting with NRR.¹³⁰⁷

470. Mr. J. Cook testified specifically that the multiple findings of the DGB Inspection, taken together, in his mind represented a lack of appropriate discipline and control,¹³⁰⁸ and the perception of that lack was a factor in prompting the decision to institute the CCP.¹³⁰⁹

471. Consequently, on or about December 2, 1982, Consumers Power stopped balance of plant safety related work at the site, except for NSSS installation by Babcock & Wilcox Co., HVAC installation by Zack Company (with QA/QC provided by Consumers Power); post-system-turnover work under the direct control of Consumers Power; and hanger and cable reinspections already being conducted under separately established commitments

1305 J. Cook, Tr. 18400-18401, 18412-18413, 18530; B. Peck, Tr. 18929-B.

1306 B. Peck, Tr. 18929-B - 18929-C.

1307 Id.

1308 J. Cook, Tr. 18412-18413.

1309 Id.; J. Cook, April 11, 1983 prepared testimony on quality assurance at p. 3, following Tr. 18025. See also paragraphs 524-525 infra.

to the NRC.¹³¹⁰ Soils remedial work continued under the Work Authorization Procedure, and design and engineering support work continued as well. In addition, on that date, Consumers Power presented its concept of the Construction Completion Program to the NRC.¹³¹¹ This program was developed, inter alia, to address the programmatic and generic QA/QC concerns raised in the second item of the Notice of Violation.¹³¹²

472. Consumers Power Company recognized the need for a comprehensive plan to improve QA implementation in the project so as to complete construction in accordance with regulatory requirements. The CCP presented a comprehensive and systematic plan for resolving the problems of the project.¹³¹³

i. The CCP Proper

473. A major feature of the CCP is the Quality Verification Program ("QVP"), sometimes referred to in the testimony as the "backward look." As Mr. Keppler testified, a logical step at Midland was to require construction verification and review of activity in progress.¹³¹⁴ After the DGB Inspection, Consumers Power added to its proposals a complete review of all

1310 J. Cook, April 11, 1983 prepared testimony on quality assurance at pp. 5, 16 and Attachment 1 - CCP Plan Document Section 9.0 at p. 20, following Tr. 18025.

1311 Id.

1312 B. Peck, prepared testimony at p. 2, following Tr. 18921. See also paragraph 427 supra.

1313 J. Cook, April 11, 1983 prepared testimony on quality assurance, Attachment 1, following Tr. 18025.

1314 Keppler, Tr. 15508.

completed safety related work independent of the "vertical slice."¹³¹⁵ For the purpose of providing the necessary assurance that regulatory requirements are met on the Midland project, the QVP includes a complete backward look at installed components and materials in safety related portions of the plant. The proposal for a "backward look" was formally put forward in a January 10, 1983 letter.¹³¹⁶ The QVP was not part of the September 17 letter nor was the idea raised in the September discussions with the Staff.¹³¹⁷

474. An important aspect of the CCP (as finally documented)³¹⁸ was the integration of balance-of-plant QC into MPQAD, thus placing the entire quality control function under Consumers Power's direct management for the first time. As previously noted,¹³¹⁹ the Midland Section had recommended that Consumers Power take over the quality control function from Bechtel in the late summer of 1982. Consumers Power had, in 1981, taken over the QC function for the Zack Company, the subcontractor for the heating, ventilating, and air conditioning (HVAC) work. In addition, Consumers Power had previously integrated the soils QC function into MPQAD.¹³²⁰ Thus there

1315 Keppler, Tr. 15270-15272.

1316 J. Cook, April 11, 1983 prepared testimony on quality assurance, Attachment 1 at p. 1, following Tr. 18025. See also Shafer, Tr. 16023-16026.

1317 Keppler, Tr. 15269.

1318 Consumers Power Exhibit No. 48.

1319 See paragraphs 377-378, 464 supra.

1320 Id.; Cook, Tr. 18210-18211, 18214.

was ample precedent for Consumers Power to rely on in taking over balance of plant QC.

475. The idea of a third party overview of QA implementation first appeared in the NRR-Region III August suggestions¹³²¹ which were probably conveyed to Consumers Power in paraphrased form, but the two Consumers Power September 17, 1982 letters for both soils and balance of plant focused on a broader type of third party review for the continuation of work.¹³²² Mr. J. Cook testified that both the Staff and Consumers Power came up with the idea of using third party reviews because such reviews have become "a way of doing business in the current environment."¹³²³

476. At some time after the completion of the DGB Inspection, the Staff asked Consumers Power to take the new proposals it had developed for the CCP and put them together with the prior proposals, especially overview, contained in the September 17, 1982 letter in one package to facilitate NRC review.¹³²⁴ When Consumers Power stopped work at the site, they presented orally to the Staff at the site the features of the augmented CCP.¹³²⁵ The Staff, probably after the December 7, 1982 meeting between Region III and NRR, requested that

1321 See paragraph 380 supra.

1322 Keppler, October 29, 1982 prepared testimony with respect to quality assurance, Attachments E & F, following Tr. 15111. Keppler, Tr. 15269-15272.

1323 J. Cook, Tr. 18302.

1324 Keppler, Tr. 15272.

1325 Keppler, Tr. 15279.

the Applicant combine the new material with the older proposals from September in a single document.¹³²⁶ The request may have taken place later in December.¹³²⁷ The result was Consumers Power's January 10, 1983 letter setting forth the plan now known as the CCP.¹³²⁸ The January 10 letter was a composite which included some proposals from the September 17 letter, some from a later October 4, 1982 letter, and the third party review program.¹³²⁹

477. As conceived in the January 10 letter, the CCP established a number of goals. Mr. J. Cook set these forth in his testimony:

significantly reduce safety-related construction by the prime contractor and clear the plant of construction equipment and materials in affected areas;

review equipment status to assure that proper layup precautions are in place;

absorb the prime contractor's Quality Control function into the Company's QA department and reorganize to assure effective management and single point accountability;

recertify quality control inspectors and strengthen the inspection process;

bring quality inspections up to date;

1326 Keppler, Tr. 15278.

1327 Keppler, Tr. 15280.

1328 Keppler, Tr. 15279. See also J. Cook, April 11, 1983 prepared testimony on quality assurance, Attachment 1, following Tr. 18025; Consumers Power Exhibit No. 48.

1329 J. Cook, Tr. 18301-18302.

verify quality inspections on completed work;

review the adequacy of certain QA program elements;

completely survey the plant and develop an accurate and up-to-date status report on construction completion;

reorganize the construction production forces into teams on a system or area basis to conduct the status assessment;

complete construction under the direction of the same team that carried out the stusing;

provide for a formal management review program to monitor CCP activities; and

establish a third-party review.¹³³⁰

478. The CCP tasks are broken down into two phases.

The goals of Phase 1 are to obtain a definitive picture of exactly what work had been completed as of the shutdown and simultaneously to conduct a definitive review of the adequacy of past quality inspections of completed work via reinspection and review of quality documentation.¹³³¹ The goal of Phase 2 is completion of construction under an improved quality assurance-quality control program which will assure that remaining work conforms to designs and specifications.¹³³² The plant is to be divided into many distinct segments or "modules" and a con-

1330 J. Cook, April 11, 1983 prepared testimony on quality assurance at pp. 5-6, following Tr. 18025.

1331 Id. at p. 6.

1332 Id.

struction team, including a QA representative, will be assigned to each system or area.¹³³³

479. In the January 10 submittal, Consumers Power broke down the elements of the CCP into eight headings: preparation of the plant, QA/QC organization changes, program planning, program implementation, quality program review, third party reviews, system layup, and continuing work activities.¹³³⁴ Preparation of the plant and system layup took place in December, 1982 and January and February, 1983. These activities consisted of clearing the safety related buildings of tools, equipment, uninstalled materials, and debris, and protecting completed systems or portions thereof from deterioration during the period of inactivity.¹³³⁵ Certain safety-related work, specifically NSSS work, HVAC installation, Consumers Power's own post system turnover work, hanger and cable reinspections under prior separate commitments to the NRC, and remedial soils work were not included within the scope of the CCP or the December 2 work stoppage.¹³³⁶

480. We have already noted that in August of 1982 Consumers Power took over the QC function in the soils area and placed it under the direction of Mr. Meisenheimer, the Soils Quality Superintendent. Mr. J. Cook's September 17 letter

1333 Id.

1334 Id. at p. 7.

1335 Id. at pp. 7-8, 16.

1336 Id. at p. 16.

(Serial No. 18850) documented Consumers Power's commitment to extend this reform to balance of plant work. Consumers Powers carried forward that commitment into the CCP. Consumers Power advised the NRC Staff of the structure of the new QA organization on December 15, 1982 and placed the new organization into effect on January 17, 1983.¹³³⁷

481. Mr. Wells described the new organization, which he heads, and its staffing. Mr. Wells, as Executive Manager of MPQAD reports directly to Mr. J. Cook, and the top echelon QA managers now report to Mr. Wells. These include Mr. Bird, Manager of the Quality Services and Audit Division, Mr. Friedrich, QC Division Superintendent, Mr. Curland, Principal Technical Advisor, Mr. Meisenheimer, Remedial Soils Division Superintendent, Mr. Leonard, Plant Assurance Division General Superintendent, and Mr. Ewert, Administration and Training Division Head.¹³³⁸ Mr. Wells testified that the integration of QC into MPQAD was important, but that it alone would not lead to an improved QA organization. The integration coupled with all the other steps Consumers Power had taken would, however, lead to a stronger organization. Further, the integration of QC into MPQAD would create single point accountability for the entire quality activity.¹³³⁹ Mr. Wells has that single point

¹³³⁷ Id. at p. 8; Stamiris Exhibit No. 48.

¹³³⁸ Wells, Tr. 18015-18019; Consumers Power Exhibit No. 46; Wells, prepared testimony on quality assurance at p. 5 and Attachment 2, following Tr. 18027.

¹³³⁹ Wells, Tr. 18208-18210.

of accountability.¹³⁴⁰ In addition to these organizational changes, the CCP includes a quality program review, which is directed toward resolving the generic issues raised by the DGB Inspection.¹³⁴¹ As Mr. Gardner from Region III stated, in order for the Staff to assess favorably the adequacy of the CCP verification program, Consumers Power had to address, in the program, areas of potential nonconformance which might exist in the plant but had not yet been identified as indicated by the DGB Inspection.¹³⁴²

482. Program planning and program implementation represent the heart of the CCP. Phase 1 and Phase 2 both have planning and implementation aspects. Phase 1 planning consists of planning a team organization for each "module" to conduct the assessment status of construction. It also includes planning for the reinspection program of completed work (conducted by MPQAD, not the teams) which constitutes the QVP.¹³⁴³ Phase 1 implementation involves executing the plans for those two activities. Phase 2 planning involves developing work procedures for the completion of construction and establishing scheduling methods as well as training team members. Again, implementation simply means execution of those plans.¹³⁴⁴ The

1340 Wells, Tr. 18668.

1341 J. Cook, April 11, 1983 prepared testimony on quality assurance at p. 15, following Tr. 18025. See paragraphs 426-449 supra.

1342 Gardner, Tr. 15026-15027.

1343 J. Cook, April 11, 1983 prepared testimony on quality assurance at pp. 9-11, following Tr. 18025.

1344 Id. at 12-14.

CCP also involves management reviews at the end of both Phase 1 planning and Phase 2 planning.¹³⁴⁵

483. Of the various aspects of the CCP, the details of the QVP are among the most important to the Board. First, the "team" members do not perform the QVP reinspection;¹³⁴⁶ rather, retrained and recertified QC inspectors do the reinspection.¹³⁴⁷

484. For inaccessible systems, documentation review will be performed.¹³⁴⁸ Mr. Shafer testified that currently accessible systems will not be made inaccessible because Consumers Power will not start additional work on those systems until the reinspection is completed.¹³⁴⁹ Moreover, there was in the past a program to do a 100% reinspection of rebar in concrete, one of the major inaccessible items.¹³⁵⁰ Originally, Consumers Power did not propose to do a 100% reinspection of accessible past work; rather, it wished to use a sample approach until some predetermined fraction of deficiencies appeared.¹³⁵¹ The NRC Staff, however, urged 100% reinspection, and Mr. Keppler ultimately testified that 100% reinspection would be required

1345 Id. at 14.

1346 Rutgers and Wells, Tr. 18316-18317.

1347 Wells, Tr. 18670-18673.

1348 Gardner, Tr. 16046; J. Cook, April 11, 1983 prepared testimony on quality assurance at p. 12, following Tr. 18025.

1349 Gardner and Shafer, Tr. 16085-16087.

1350 Gardner, Tr. 16753; R. Cook, Tr. 16755-16756.

1351 Gardner ~~at~~ Tr. 16040.

unless Consumers Power could justify a lesser amount to the Staff's satisfaction.¹³⁵² Consumers Power did ultimately commit to 100% reinspection of closed inspection records for accessible systems.¹³⁵³ This 100% reinspection will cover closed IPINs and DRs as well as NCRs.¹³⁵⁴ There is a provision in the QVP for Consumers Power to ask the NRC Region III that reinspection be reduced below 100% if a sufficient baseline of low deficiencies is established.¹³⁵⁵

485. Mr. J. Cook agreed that the QVP is necessary to remove any doubt about the adequacy of past construction.¹³⁵⁶ According to Mr. Wells, the QVP will verify the quality of all hardware installed and inspected before December 2, 1983.¹³⁵⁷ In this manner, the QVP will assist us in reaching a licensing decision for the Midland Plant. A document review for inaccessible items is part of the process.¹³⁵⁸ The Applicant conducted a management review of the QVP in April of 1983 and found that

¹³⁵² Keppler, Tr. 15383-15384. J. Cook, April 11, 1983 prepared testimony on quality assurance, Attachment 4, following Tr. 18025.

¹³⁵³ Shafer, Tr. 16801; Wells, Tr. 18662-18665; J. Cook, Tr. 18329-18330; Consumers Power Exhibit No. 48.

¹³⁵⁴ J. Cook, Tr. 18490; Wells, Tr. 18492, 18560-18561; Consumers Power Exhibit No. 48, Attachment 1 at pp. 11-12.

¹³⁵⁵ Wells, Tr. 18556-18562; Consumers Power Exhibit No. 48, Attachment 1.

¹³⁵⁶ J. Cook, Tr. 18375-18378.

¹³⁵⁷ Wells, Tr. 18254-18257.

¹³⁵⁸ Id.

some additional work needed to be done on the program before it could begin.¹³⁵⁹

486. Another issue which the June 10 letter resolved was the issue of NRC hold points; the NRC Staff wanted explicit hold points, and Consumers Power put them in.¹³⁶⁰ The June 10 letter also established some specific third party¹³⁶¹ hold points.¹³⁶² The third party will audit the accuracy of the management reviews necessary to initiate Phase 1 of the CCP. There are additional hold points at the end of all Phase 1 Management Reviews in conjunction with the release of Phase 2 work.

487. Another issue regarding the appropriateness of the structure of the CCP was the presence of QA representative on construction completion teams. A question was raised that the required independence of QA personnel could be compromised by this arrangement. However, Mr. J. Cook indicated that the QA team representative would only take schedule direction from team management; all substantive QA direction would come from MPQAD management.¹³⁶³ Furthermore, Mr. Gardner of the Region III Inspection Staff testified that he did not believe that the presence of QA or QC personnel on teams violated 10 C.F.R.

1359 J. Cook and Wells, Tr. 18344-18347.

1360 J. Cook, Tr. 18327-18330.

1361 See paragraph 502 infra.

1362 J. Cook, Tr. 18333-18341.

1363 J. Cook, April 11, 1983 prepared testimony on quality assurance at p. 7, following Tr. 18025.

Part 50, Appendix B.¹³⁶⁴ Thus we find the proposed arrangement to be acceptable.

488. Mr. Keppler in general appeared to be enthusiastic about the CCP. He stated, for example, that if the CCP and related overview programs had been in place our April 30, 1982 Order might not have been necessary.¹³⁶⁵ He stated that he did not want a work authorization procedure for the balance of plant work like that used to approve soils work.¹³⁶⁶ He also testified concerning the extensiveness of the steps being taken at Midland, including the third-party review of all ongoing work in soils and balance of plant, a major quality verification program also overviewed by a third party, plus intense scrutiny by the NRC Midland Section.¹³⁶⁷ Mr. Keppler believed that NRC Staff oversight, coupled with the other programs, gave him the confidence necessary for allowing work to proceed at the site.¹³⁶⁸

489. This effort should be sufficient to provide confidence to the NRC Staff, the Board, and the public that the plant will be completed in accordance with regulatory requirements.¹³⁶⁹ Mr. Keppler volunteered to return personally during

1364 Gardner, Tr. 16072-16075.

1365 Keppler, Tr. 15673.

1366 Keppler, Tr. 15625-15629.

1367 Keppler, Tr. 15626-15627.

1368 Keppler, Tr. 15509-15510.

1369 Keppler, March 25, 1983 prepared testimony with respect to quality assurance at pp. 5-6, following Tr. 15114.

the OL phase of the licensing hearings to inform us as to how the CCP is working.¹³⁷⁰ With those programs, the number of NRC Staff members assigned to oversee Midland, he said, was sufficient.¹³⁷¹ Mr. Keppler, in noting that Consumers Power will manage the QVP,¹³⁷² indicated that it was important that Consumers Power have this responsibility because the Applicant will ultimately have to run the plant and determine quality issues involved in that undertaking.¹³⁷³ Mr. Keppler recalled saying at the February 8, 1983 public meeting in Midland that he believed that comprehensive programs would prove completed construction at Midland to be sound.¹³⁷⁴ The basis for this statement was the QVP, the third party overviews, and the independent design and construction reviews (vertical slice).¹³⁷⁵

490. Other Staff members testified as to their confidence as well. Mr. Gardner testified that independent overview of a construction completion program was a unique feature of the Midland program.¹³⁷⁶ Messrs. Harrison and R. Cook testified that, although they had observed a decline in QA performance at Midland since 1981, the new controls put in place gave them confidence that the plant could be completed properly.¹³⁷⁷

1370 Keppler, Tr. 15631-15632.
1371 Keppler, Tr. 15352.
1372 Keppler, Tr. 15376.
1373 Keppler, Tr. 15378.
1374 Keppler, Tr. 15381.
1375 Keppler, Tr. 15382.
1376 Gardner, Tr. 16751.
1377 R. Cook, Tr. 21185-21188.

491. The Staff had recommended that Mr. Keppler lock Consumers Power into the CCP with a confirmatory order, so that Consumers Power could not deviate from the Program without Staff approval.¹³⁷⁸ Mr. Keppler indicated that there would probably be some sort of confirmatory order when the CCP was approved.¹³⁷⁹ He felt that the CCP was very close to approval in May, when he testified.¹³⁸⁰ We observe that Richard DeYoung, Director of the Office of Inspection and Enforcement, issued a "Confirmatory Order for Modification of Construction Permits (Effective Immediately)" on October 6, 1983.¹³⁸¹ This order modifies the Midland Construction Permits to require Consumers Power to adhere to the CCP subject to certain conditions. The Board is encouraged by the development and Staff approval of the CCP and we find no need to impose additional formal constraints regarding the CCP on Consumers Power in the form of a Board order.¹³⁸²

2. Third party reviews

a. Introduction

492. During the summer of 1982, Consumers Power began planning some type of independent review, recognizing that the NRC had recently begun requiring similar assessments from all

1378 Shafer, Tr. 15043.

1379 Keppler, Tr. 15125-15126.

1380 Keppler, Tr. 15675.

1381 Attachment to Letter from Michael Wilcove to the Board and parties, dated December 15, 1983.

1382 We note that, under the Confirmatory Order, the Regional Administrator has the discretion to modify or eliminate requirements of the CCP, including those concerning third party reviews.

other nuclear plants nearing completion.¹³⁸³ On July 9, 1982 the NRC Staff made a formal request for such a review at Midland.¹³⁸⁴ In October, Consumers Power made an initial proposal for the review which included (1) a design verification by an independent reviewer; (2) the Consumers Power biennial QA program audit conducted by MAC; and (3) a self-initiated construction project evaluation ("SIE") to be coordinated through INPO, an industry group.¹³⁸⁵ The Staff advised Consumers Power that it could not accept the MAC biennial audit or the SIE as part of the review because MAC lacked sufficient independence under the Palladino criteria.¹³⁸⁶ However, another independent review covering non-soils construction, the Construction Implementation Overview ("CIO"), was added later as part of this CCP.¹³⁸⁷ Mr. Keppler considers these third party reviews essential to his "reasonable assurance" that the past and current work at Midland is properly done.¹³⁸⁸

b. IDCVP

493. The Independent Design and Construction Verification Program ("IDCVP") is an examination of all aspects --

1383 J. Cook, April 11, 1983 prepared testimony on quality assurance at pp. 6 and 17-18, following Tr. 18025; J. Cook, Tr. 18301-18302.

1384 J. Cook, April 11, 1983 prepared testimony on quality assurance at p. 18, following Tr. 18025.

1385 Id. at p. 18 and Attachment 5.

1386 Id. at p. 18; Keppler, Tr. 15254-15255.

1387 J. Cook, April 11, 1983 prepared testimony on quality assurance at p. 19, following Tr. 18025.

1388 Keppler, Tr. 15131, 15134-15135, 15382-15383.

historical and current -- of the design and construction of several selected safety-related systems.¹³⁸⁹ It is a so-called "vertical slice" review to ensure that the particular system will function in accordance with its safety design bases and that the licensing commitments attendant to it have been implemented properly.¹³⁹⁰ Initially, Consumers Power proposed that the IDCVP only involve the Unit 2 Auxiliary Feedwater System.¹³⁹¹ However, the NRC Staff suggested that other systems be included.¹³⁹² In December 1982, Consumers Power expanded the IDCVP to cover the diesel generator electric power system and the habitability aspects of the control room HVAC as well.¹³⁹³ In the design area, the review will consist of an examination of each system's design criteria and commitments, implementation documents, calculations and evaluations, combination of calculations or evaluations, and drawings and specifications.¹³⁹⁴ In the construction area, the review will involve an examination of supplier documents, storage and maintenance documents, construction installation documents, verification activities and verification of physical configuration.¹³⁹⁵ Further,

1389 J. Cook, April 11, 1983 prepared testimony on quality assurance at pp. 19-20, following Tr. 18025.

1390 Id.

1391 Id.

1392 Keppler, Tr. 15256-15258.

1393 J. Cook, prepared testimony on quality assurance at pp. 20-22 and Attachment 6, following Tr. 18025.

1394 Id. at p. 22.

1395 Id. at pp. 22-23.

Consumers Power committed to augment the scope of the IDCVP in order to accommodate design review findings with generic implications including any additional areas of other systems.¹³⁹⁶

494. Consumers Power chose the TERA Corporation ("TERA"), a firm which specializes in providing consulting services for all areas of the nuclear industry, to complete Midland's IDCVP. TERA was selected from among a group of three potential contractors.¹³⁹⁷ It was selected for the strength of its technical competence and QA program and its direct experience with other similar review programs at such nuclear plants as Diablo Canyon, Grand Gulf and Palo Verde.¹³⁹⁸ The TERA team assigned to Midland includes personnel experienced in mechanical, electrical, structural and thermal hydraulic evaluations of system design.¹³⁹⁹ The TERA review team meets the independence standard set out in the Palladino Criteria.¹⁴⁰⁰

495. In March 1983, the NRC Staff issued a protocol for IDCVP communications among all the parties; Consumers Power instructed TERA to develop procedures embracing the protocol concepts.¹⁴⁰¹ The results of the TERA team's IDCVP will be reported concurrently to the NRC and Consumers Power through the

1396 Id. at p. 23.

1397 Id. at p. 20.

1398 Id.

1399 Id. at p. 21.

1400 Id. at p. 21; see also page 33 supra.

1401 J. Cook, April 11, 1983 prepared testimony on quality assurance at p. 24 and Attachment 4 at Enclosure I, following Tr. 18025.

issuance of findings and the submission of a final report.¹⁴⁰²
This procedure was issued by TERA in its QA Plan on November 11,
1982 and submitted to the NRC Staff on February 9, 1983.¹⁴⁰³

496. As of the presentation of the testimony, TERA had begun the design verification of the Auxiliary Feedwater ("AFW") System; it has already issued an initial status report, with findings, based on this examination.¹⁴⁰⁴ The design verification of the diesel generator electric power system and habitability aspects of the control room HVAC had not yet begun at the time of the testimony.¹⁴⁰⁵ TERA's construction verification will not continue until the CCP, Phase 1 activities to determine installation and inspection status of the systems, has been implemented.¹⁴⁰⁶

497. In the initial TERA report, the only finding Consumers Power considered significant at the time of the hearings was that the plant design requirements calling for the AFW equipment to be battery powered had not been met.¹⁴⁰⁷ The TERA report made several other findings: one related to the adequacy of the nuclear steam supply system ("NSSS") perfor-

1402 Id. at p. 24.

1403 Id.

1404 Id. at p. 23; J. Cook, Tr. 18359-18364; Stamiris Exhibit No. 101.

1405 J. Cook, April 11, 1983 prepared testimony on quality assurance at pp. 23-24, following Tr. 18025.

1406 Id. at p. 24.

1407 J. Cook, Tr. 18360-18361.

mance requirement for the AFW system; another involved the feed only good generator systems performance during a steam generator tube failure followed by loss of off-site power; another concerned the fact that a horizontal snubber hanger was found some distance from its design location.¹⁴⁰⁸ None of these had previously been discovered by Bechtel or Consumers Power.¹⁴⁰⁹ However, at the time of the testimony, Consumers Power had not yet completed its investigation of the TERA findings and could not confirm whether these items were correct or significant.¹⁴¹⁰ For example, in its partially completed review of the hanger finding, Consumers Power discovered that there were approved design drawings for the hangers and it is possible the TERA team was unaware of the change process.¹⁴¹¹ Finally, the TERA team also found some interface problems between Babcock & Wilcox (B&W) and Bechtel.¹⁴¹² That problem had also been noted in a 1982 Bechtel design review, but only as a general statement of industry concern.¹⁴¹³ Consumers Power expected any design review to be structured so as to address the question.¹⁴¹⁴

1408 J. Cook, Tr. 18359-18364; Stamiris Exhibit No. 101, Attachment 3, C-005, C-25, C-32.

1409 J. Cook and Rutgers, Tr. 18364.

1410 J. Cook and Rutgers, Tr. 18364-18365.

1411 Rutgers, Tr. 18365.

1412 J. Cook, Tr. 18366.

1413 J. Cook, Tr. 18366-18372.

1414 Id.

c. Construction Implementa-
tion Overview

498. The other major third party review is the Construction Implementation Overview (CIO), involving observation and evaluation of the site's non-soils construction activities.¹⁴¹⁵ The CIO was modeled after the construction overview in the soils area; it is intended to provide confidence that the work at the site is performed in accordance with all procedures and requirements and that Consumers Power's CCP commitments are fulfilled.¹⁴¹⁶ Consumers Power initially presented the concept of the CIO to the NRC Staff on December 2, 1982.¹⁴¹⁷ A short time later, it confirmed the CCP program with the NRC Staff and assured them that the CCP activities would be evaluated through the process of the CIO.¹⁴¹⁸ The NRC Region III Administrator presently views the CIO as an essential element of his findings of reasonable assurance that Midland will be constructed in accordance with regulatory requirements.¹⁴¹⁹

499. Consumers Power chose S&W to act as third party reviewer for the CIO.¹⁴²⁰ It had initially considered both TERA and S&W for the contract because both companies were

¹⁴¹⁵ J. Cook, April 11, 1983 prepared testimony on quality assurance at pp. 24-25, following Tr. 18025.

¹⁴¹⁶ Id.

¹⁴¹⁷ Id. at p. 25.

¹⁴¹⁸ Id. and Attachment 1 at Enclosure pp. 16-18.

¹⁴¹⁹ Keppler, Tr. 15131.

¹⁴²⁰ J. Cook, April 11, 1983 prepared testimony on quality assurance at p. 25, following Tr. 18025.

already familiar with Midland procedures and activities as participants in the IDCVP and the third party soils review.¹⁴²¹ S&W was ultimately selected over TERA because its size and experience better equips it to deal with the scope of the CIO, and because the CIO could interfere with TERA's concurrent involvement with the IDCVP.¹⁴²² S&W's corporate qualifications of independence and competence have already been discussed in these findings.¹⁴²³ The NRC Staff has determined that with regard to the Midland Project, S&W has met the Palladino Criteria.¹⁴²⁴

500. The particular S&W team assembled to conduct the CIO is competent for the task and independent enough from Consumers Power to accomplish it.¹⁴²⁵ The team includes members experienced in QA/QC control and construction activities in the electrical, mechanical, instruments and controls, and special process areas.¹⁴²⁶

501. In the CIO, S&W will assess the adequacy of and compliance with CCP procedures and inspection plans and will review aspects of construction activities.¹⁴²⁷ Specifically, a

1421 Id.

1422 Id. at pp. 25-26.

1423 See paragraph 383 supra, for a discussion of S&W organizational qualifications and independence from Consumers Power.

1424 Id.

1425 J. Cook, April 11, 1983 prepared testimony on quality assurance at pp. 26-27, following Tr. 18025.

1426 Id.

1427 Id. at p. 28.

field team will monitor, at the site, the effectiveness of CCP and other activities, using special procedures, checklists and sampling techniques to evaluate the:

- ° Adequacy of controls and practices in the Quality Assurance Program to determine that design information is incorporated in installed hardware;
- ° Conformance of installed hardware to design information in specifications and drawings;
- ° Completeness of Consumers Power's and Bechtel's procedures regarding construction activities, personnel qualifications, training programs, and organizational practices;
- ° Compliance of the CCP Teams with prescribed procedures;
- ° Compliance of Quality Control personnel with procedures;
- ° Compliance of construction activities with procedures. 1428

The CIO will also include audits of the management reviews of the CCP described earlier. 1429

502. Finally, in response to an NRC inquiry, Consumers Power included in the CIO commitments to establish key hold points for the third party reviewers, to honor those hold points and to assure that critical parameters of the CCP program are in place before its next step proceeds. 1430 Certain

1428 Id.

1429 Id.

1430 J. Cook, April 11, 1983 prepared testimony on quality assurance at Attachment 3, pp. 1-2, following Tr. 18025; J. Cook, Tr. 18327-18330.

of the hold points were formally documented in Consumers Power's letters to the NRC Staff on June 3 and June 10, 1983 and in the CCP itself.¹⁴³¹ Consumers Power has agreed not to go forward with CCP implementation beyond the hold points until the third party reviewer is satisfied, documents the satisfaction and concurs that the CCP should continue.¹⁴³² It should be noted that the hold points for the first phase were in place at the time of the hearing.¹⁴³³ There will probably be similar hold points on the second phase.¹⁴³⁴ The placement of other hold points will be determined by Consumers Power with the concurrence of the NRC Staff.¹⁴³⁵

503. S&W will hold weekly progress meetings to discuss its CIO activities with Consumers Power, its contractors and the NRC Staff.¹⁴³⁶ In addition, on a monthly basis, the CIO site team will submit their observations to an S&W Senior Overview Committee, comprised of members of S&W's senior management, for review.¹⁴³⁷ However, any serious programmatic observations made by the site team are to be immediately reviewed by

1431 J. Cook, Tr. 18327-18334.

1432 J. Cook, April 11, 1983 prepared testimony on quality assurance at pp. 28-29 and Attachment 3 at pp. 1-2, following Tr. 18025; Consumers Power Exhibit No. 48 at pp. 31-32; Cook, Tr. 18334.

1433 J. Cook, Tr. 18335-18337.

1434 J. Cook, Tr. 18337-18338.

1435 J. Cook, Tr. 18338-18342.

1436 J. Cook, April 11, 1983 prepared testimony on quality assurance at p. 29, following Tr. 18025.

1437 Id.

the Senior Overview Committee to determine if the observation is significant enough to report to Consumers Power and the NRC.¹⁴³⁸ After six months of operation, S&W will submit an initial CIO report to both the NRC and Consumers Power, evaluating the Midland Project's cumulative performance.¹⁴³⁹ Based on these findings, Consumers Power will recommend to the NRC whether any modifications should be made to S&W's CIO responsibilities; the modifications must be agreed upon by the NRC.¹⁴⁴⁰ The CIO will continue until Consumers Power and the NRC have confidence in the adequacy of the Midland QA program.¹⁴⁴¹

D. Conclusion

504. Based on Mr. Keppler's statements in his March 25, 1983 written testimony that, in order to have reasonable assurance that Consumers Power can complete the plant in accordance with regulatory requirements, he would need an independent overview of construction, an independent design and construction verification, and NRC Staff oversight of construction and QA activities,¹⁴⁴² all of which are to be found in the CCP, and, based on the NRC Staff's review and approval of the CCP,

1438 Id.

1439 Id.

1440 Id.

1441 Id. at pp. 29-30.

1442 Keppler, March 25, 1983 prepared testimony with respect to quality assurance at p. 6, following Tr. 15114. See also notes 1367-1368 at p. 329, supra.

we find that there is reasonable assurance that Consumers Power will complete the balance of plant work properly and will demonstrate that past construction either has been performed in accordance with regulatory requirements or will be replaced with work of requisite quality.

505. This Board finds that the IDCVP and CIO are comprehensive measures formulated by Consumers Power to ensure adequate completion of the Midland facility. We agree with the NRC Staff that the third party overviews and verifications are important to providing reasonable assurance that the plant will operate effectively, safely and in accordance with the quality assurance objectives and requirements of the regulations. We are impressed with the competence and independence of those chosen to conduct the third party assessments -- S&W and TERA. We are similarly impressed with the commitment Consumers Power has made to implement the reviews and integrate their results into the Midland Project. This commitment together with the reviews themselves and the improvements put in place in the soils area give us the requisite assurance that the soils remedial activities will be completed in accordance with all regulatory requirements.

V. ISSUES RELATED TO THE CONTENTIONS

506. We have dealt thus far with the broader aspects of quality assurance implementation in remedial soils work. We have also examined the broad implications of quality assurance problems in balance of plant work and of programs proposed for the resolution of those problems. We have not lost sight, however, of the specific contentions in this phase of the proceeding relating to quality assurance, namely, the first three Contentions of Ms. Stamiris.¹⁴⁴³ It is to those that we now turn our attention. We have heard evidence in the reopened hearings which is relevant to the general allegations of each of those three contentions as we understand them. We deal with each contention and the related evidence in turn.

A. Lack Of Candor

507. In its general allegation, Ms. Stamiris' Contention No. 1 states:

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, . . . and this managerial attitude necessitates stricter than usual regulatory supervision (ALAB-106) to assure appropriate implementation of the remedial steps required by the Order Modifying Construction Permits, dated December 6, 1979.

¹⁴⁴³ See Prehearing Conference Order Ruling on Contentions and on Consolidation of Proceedings, dated October 24, 1980.

508. We have dealt with the specifics of the examples of the Contention and further examples from answers to interrogatories in paragraphs 85-138 of these Findings supra. We found in summary in paragraph 139 of these Findings supra that none of the evidence relating to the examples Ms. Stamiris listed under Contention 1 indicated either separately or taken as a whole that Consumers Power management had been wanting or recalcitrant in providing safety information to the NRC Staff. We did note, however, the occasional existence of technical disputes between Consumers Power's engineering staff and NRC engineering Staff, all of which were resolved to the Staff's satisfaction.

509. Since the reopening of the record, we have also heard evidence on what have come to be termed "communications problems" between Consumers Power and the Staff. We examine the evidence on these matters to ascertain whether they have any bearing on the contention's allegation of a management attitude which engenders lack of candor.

510. The Staff brought to our attention a number of matters which they characterized as poor communications with the NRC Staff. For example, Staff members brought to our attention what they considered to be a problem of obtaining information from Consumers Power and Bechtel employees. They expressed the opinion that there had been a reluctance on the part of these personnel to provide information to NRC inspec-

tors and to speak candidly with the Staff.¹⁴⁴⁴ Two Staff members also criticized Consumers Power for having supplied them with information which they considered misleading.¹⁴⁴⁵

511. Concerning the assertion that project staff members are reluctant to provide information to the NRC, Mr. Rutgers, the Bechtel Project Manager, testified that Bechtel as an organization is not reluctant to provide the NRC Staff with information. To the contrary, he said, Bechtel's concern that the NRC Staff should be supplied with accurate and timely responses to questions prompted the issuance of memoranda which were designed to identify specific individuals within Bechtel who could provide correct and authoritative information in given subject areas.¹⁴⁴⁶ We also note that Mr. Shafer of the NRC identified a December, 1982 Consumers Power memorandum as

¹⁴⁴⁴ Landsman and R. Cook, Tr. 14396-14404, 14417-14419.

Dr. Landsman further criticized Consumers Power for not keeping him promptly informed of certain problems. One example in this regard was the U.S. Testing audit results. Another concerned a problem which arose with the interface between two different PQCI's. Landsman, Tr. 16791-16794.

Both of these situations were explained as not representing communication problems. Mr. R. Cook and Mr. Gardner stated that communication of the audit results from Consumers Power was adequate. R. Cook and Gardner, Tr. 16791-16792. With regard to the PQCI interface problem, Mr. Wheeler stated that he believed communication of this problem to Dr. Landsman would have been premature. Wheeler, Tr. 18787. Mr. Wheeler's approach was consistent with Dr. Landsman's expressed position that Consumers Power should make certain that it supply complete information to the NRC Staff in order to avoid misunderstandings. See Landsman, Tr. 16519-16520.

¹⁴⁴⁵ R. Cook and Landsman, Tr. 17485-17499.

¹⁴⁴⁶ Rutgers, April 11, 1983 prepared testimony on quality assurance at pp. 20-23, following Tr. 18035; Tr. 18085-18092.

an attempt by Consumers Power to insure that erroneous information concerning the CCP was not supplied to the NRC Staff.¹⁴⁴⁷

512. Mr. Shafer further testified that he is unaware of any further problems in obtaining information from Consumers Power.¹⁴⁴⁸ Mr. Gardner also testified that, at the present time, he did not find a reluctance on the part of Consumers Power to discuss information with NRC inspectors.¹⁴⁴⁹ Moreover, Dr. Landsman now receives daily phone calls concerning significant events in soils work at the site.¹⁴⁵⁰ While Mr. Harrison of the NRC Staff testified that communication difficulties have in the past been a significant problem for Consumers Power, he believed communications between Consumers Power and the NRC Staff have improved.¹⁴⁵¹

513. Mr. J. Cook of Consumers Power testified that he is concerned about full and candid communications between Consumers Power and the NRC Staff. He stated that he is attempting to keep the NRC fully informed of site activities and that he has asked the Staff for assistance in resolving the communi-

¹⁴⁴⁷ Shafer, Tr. 14709-14717; Stamiris Exhibit No. 53.

Dr. Landsman did identify a Staff exhibit written by a Bechtel supervisor in the MPQAD as indicating to him that it was unacceptable for some individuals in MPQAD to discuss matters with NRC inspectors. Landsman, Tr. 14417-14419; Staff Exhibit No. 19.

¹⁴⁴⁸ Shafer, Tr. 16521-16523.

¹⁴⁴⁹ Gardner, Tr. 16522.

¹⁴⁵⁰ Landsman, Tr. 16524; Mooney, Tr. 17047-17049.

¹⁴⁵¹ Harrison, Tr. 21166-21167.

cations concerns raised by Dr. Landsman.¹⁴⁵² Mr. Howell testified that he intends to examine the interactions between Consumers Power and the NRC Staff and seek to improve their relationship.¹⁴⁵³

514. We discuss at length below in section V.I A, paragraphs 561-589 a series of events involving accusations that Bechtel and Consumers Power personnel had made or condoned material false statements with respect to the status of underpinning instrumentation. We conclude in section VI.A that no material false statements were made.

515. Even before all the evidence was in, however, at a time when a number of Staff members believed that false statements had been made, virtually no Staff witness was willing to attribute malice to any of the statements. With regard to the assertion that Consumers Power had supplied misleading information to the NRC Staff, Mr. Keppler testified that he would not attribute dishonesty or deception to Consumers Power.¹⁴⁵⁴ Likewise, most members of the Staff did not conclude that the statements made concerning the completion status of the underpinning instrumentation were made with the intention of deliberately misleading the NRC. Even Dr. Landsman and Mr. R. Cook, who were critical of Consumers Power with respect

1452 J. Cook, Tr. 18418.

1453 Howell, Tr. 20940, 20943.

1454 Keppler, Tr. 15121.

to this incident, refused to testify that they believed that Mr. Boos deliberately misled them.¹⁴⁵⁵

516. Mr. Mooney also testified as to his efforts to always be truthful and forthright with Dr. Landsman. He emphasized that he has never intentionally misled Dr. Landsman.¹⁴⁵⁶ Dr. Landsman himself indicated that, after initial rough spots, Mr. Mooney's communications with the Staff have improved greatly.¹⁴⁵⁷ And, Mr. Hood of the NRC Staff acknowledged again, as he did in the earlier round of hearings,¹⁴⁵⁸ that some of the responsibility for communications failures lies with the NRC Staff.¹⁴⁵⁹

517. The other investigation discussed infra in section VI relates to allegations of a violation of our April 30, 1982 Order, LPB-82-35. This entire matter was rife with failures of communication, primarily failures of reception by Consumers Power management, but at least some errors in transmission by the Staff as well.¹⁴⁶⁰ Yet, despite the obviously strong feelings on both the Consumers Power and NRC Staff sides regarding this issue, Mr. Joseph Kane of the NRR Staff stated with respect to Mr. Mooney, one of the principal actors for Consumers Power in this dispute, as follows:

1455 Landsman and R. Cook, Tr. 17530-17534; see paragraph 579 infra; Staff Exhibit No. 22.

1456 Mooney, Tr. 17050; see also, Kane, Tr. 21875-21876.

1457 Landsman, Tr. 20881-20882.

1458 See paragraph 589 infra.

1459 See paragraph 589 infra.

1460 See paragraphs 590 to 670 for details of this incident.

I made a statement with respect to, I think, Mr. Mooney should have known, and I believe that, but I think what that does is create an impression, in my mind, that I may not have confidence in Mr. Mooney, and I have had many sessions with Mr. Mooney where they have been difficult, but I have always found him to be fair. Our differences continue, but I think he has been fair, I think he is honest, and I think he has integrity. I think his coming on board on the Midland project has helped this project move along in the right direction. So if anything I said yesterday gave an indication other than that, I think that is not my proper position. 1461

Mr. Darl Hood, NRR Project Manager for Midland, also testified that Mr. Mooney had made a definite improvement in communications between Consumers Power and NRR.¹⁴⁶² In addition, a comment was included in the SALP III report relating to improvement in the soils area which was intended to indicate that communications had substantially improved in the area of technical submissions in the time period of the SALP III report.¹⁴⁶³

518. In one instance, relating to loose sands beneath the service water piping, Consumers Power mistakenly provided incomplete information to the NRC Staff. However, the record is clear that the Applicant in that instance did not mislead the Staff, but rather failed to fully apprise itself of the results of a Bechtel Geotechnical Engineering Group liquefaction evaluation prior to a March 3, 1982 meeting. As soon as Applicant became aware that the information supplied to the

1461 Kane, Tr. 21875-21876.
1462 Hood, Tr. 20777-20779.
1463 Hood, Tr. 20883.

Staff was incomplete, it immediately corrected the error. This incident is discussed in section A.3.b, paragraphs 704-708 of Appendix A.

510. We do find that Consumers Power has experienced difficulty in communicating with the NRC Staff. However, as we have noted, representatives of Consumers Power and Becntel demonstrated a sensitivity to the problem and the resolve necessary to eradicate it. Indirect evidence of the Applicant's concern can also be seen in the issuance of memoranda aimed at ensuring the release of accurate information, the institution of daily phone calls to Dr. Landsman, and senior management efforts directed at examining the interactions between Consumers Power and the Staff and at improving those relations.

520. Most important, however, we find no reliable evidence of intentional withholding of information on the part of any Consumers Power personnel representatives. To the extent that there were mistakes of communication, we find that they were honest mistakes. We have found absolutely no evidence of lack of candor regarding the transmission of important safety information to the NRC. We do believe there was a time when there were many technical matters at issue between Consumers Power and the Staff when Applicant did not give sufficient weight to Staff views regarding the implementation of NRC requirements, but instead argued with the Staff. We believe, however, that Consumers Power has since come to a recognition that Staff views regarding implementation of NRC requirements

are entitled to great weight, and therefore now believes in general that it should agree with Staff views. Thus we perceive currently that Consumers Power is committed to understanding and meeting NRC requirements. Thus, we readopt with respect to this later phase of the hearings the substance of the conclusion we reached supra in paragraph 139.

B. Cost And Schedule Pressure

521. Stamiris Contention No. 2 reads in pertinent part:

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

We examined in paragraphs 140-235 both the specific instances Ms. Stamiris proffered in support of this Contention and the general issues of whether we could find, on the 1981 record, that financial and scheduling pressures had adversely affected resolution of soils settlement issues and led to the compromising of NRC health and safety regulations.

522. We found in paragraph 236 of our Findings supra that none of the specific instances raised by Ms. Stamiris indicated that financial and scheduling pressures had, as of 1981, adversely affected Consumers Power's resolution of soils settlement issues. We also found that cost and schedule considerations were properly taken into account but did not compromise proper resolution of the soils settlement issues.

523. During this most recent phase of the quality assurance hearings, we have heard at least one Staff member use

the phrase "putting cost and schedule ahead of quality" in describing the cause of one or more QA failures. Thus, we find it necessary to examine whether any of the evidence adduced in the reopened hearings should cause us to reevaluate the conclusion we reached in paragraph 236.

524. Mr. J. Cook of Consumers Power testified convincingly that placing cost and schedule ahead of quality was not a reason that the Midland Project had QA implementation problems. Mr. J. Cook ascribed the QA problems experienced to a number of factors, some external to the project organization and some internal. With respect to external factors, he alluded among others to the uniqueness of the cogeneration design, the age of the design of the plant envelope, and the changing regulatory requirements over the decade during which the plant has been under construction. With respect to internal factors, Mr. J. Cook pointed to two items, failure to attain sufficient discipline in the work process so as to meet Consumers Power's and the NRC's expectations, and misplaced reliance on the quality control function as part of the construction process instead of as part of the quality verification process.¹⁴⁶⁴

525. Moreover, when the management of Consumers Power became aware that their own and the NRC Staff's expectations for disciplined adherence to procedures and requirements were not being fully met, Consumers Power developed and adopted the CCP in order to exert more discipline over the remaining construction activities and to generate a set of acceptable design

¹⁴⁶⁴ J. Cook, Tr. 18006.

documents and inspection records.¹⁴⁶⁵ We find that the institution of the CCP implies a high priority for safety and quality on the part of Consumers Power.

526. Mr. J. Cook further explained that none of the three factors, cost, schedule, or quality, could be viewed in isolation. He stated that these factors are inexorably linked in achieving an efficient execution of the project: "if the quality is not achieved the other two attributes will suffer."¹⁴⁶⁶

527. Mr. Rutgers, Bechtel Power's Project Manager for Midland, echoed Mr. J. Cook in rejecting the notion that concern for cost and schedule was the cause for the breakdown in QA or for construction problems experienced at the site.¹⁴⁶⁷ He stated that cost, schedule, and quality were all essential on a project such as Midland and that he believed that cost and schedule objectives are best served by doing work right the first time. He stressed that top management of both Consumers Power and Bechtel have emphasized that quality is the first priority for the Midland Project.¹⁴⁶⁸

528. On the Staff side, Dr. Landsman, the inspector assigned specifically to soils remedial work, expressed the opinion that one of the causes of the problems at Midland has been placing concern with cost and schedule ahead of concern

¹⁴⁶⁵ J. Cook, April 11, 1983 prepared testimony on quality assurance at pp. 3-4, following Tr. 18025.

¹⁴⁶⁶ J. Cook, Tr. 18004.

¹⁴⁶⁷ Rutgers, Tr. 18155-18164.

¹⁴⁶⁸ Rutgers, April 11, 1983 prepared testimony on quality assurance at pp. 23-24, following Tr. 18035.

for quality.¹⁴⁶⁹ Mr. Gardner felt that at one point schedule pressures had affected adversely the quality of recertification training for QC inspectors.¹⁴⁷⁰ Mr. Keppler, the Regional Administrator, testified, however, that the NRC Staff has not reached a consensus as to the cause of QA implementation problems at Midland, and he further stated that he personally found no basis for concluding that Consumers Power has put cost and schedule ahead of quality.¹⁴⁷¹

529. Several Staff members believe that financial and schedule pressures have had a causal effect adverse to quality, and two Consumers Power witnesses implied that the causal relationship works in the reverse direction, i.e., good quality helps cost and schedule. In the face of this conflicting testimony, we are most inclined in any event to rely heavily on the testimony of Mr. Keppler, the most experienced regulator who testified before us. Thus we find no evidence in the recent session which causes us to reverse or modify our earlier conclusion reached in paragraph 236 of these Findings.

¹⁴⁶⁹ Landsman, Tr. 14692, 16539-16541, 16824-16825, 16920. See also, Gardner, Tr. 14481-14484; Keppler, October 29, 1982 prepared testimony with respect to quality assurance, Attachment 2 at pp. 6-7 and Attachment D at Enclosure 4, following Tr. 15111.

Mr. R. Cook also made several general comments critical of the quality of workmanship at the Midland Plant. He referred to the workmanship at Midland as "slipshod" or "shoddy." R. Cook, Tr. 14394, 14442-14443. We find such general subjective comments to be of little value in reaching our conclusions, and we further note that the ultimate concern of the NRC is whether regulatory requirements are met. See R. Cook, Tr. 16214-16216; Keppler, Tr. 15115-15116, 15606.

¹⁴⁷⁰ Gardner, Tr. 14484.

¹⁴⁷¹ Keppler, Tr. 15122, 15380.

C. Repeated Patterns Of QA Deficiencies Relating To Management Attitude

530. The third Contention of Ms. Stamiris relating to quality assurance states, in pertinent part:

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-106 and LBP-74-71) that proper quality assurance would ensue and it has not.

We considered the specifics of the example originally raised by Ms. Stamiris as basis for this contention supra in paragraphs 237-251. We concluded in paragraph 252 that Consumers Power had taken corrective action with respect to each cited deficiency and that the NRC Staff had been satisfied with the resolution of those items. We did note, however, that the Contention had a generic aspect. We stated in that paragraph: "the thrust of the contention is that these past soils deficiencies display a pattern of conduct by Consumers Power's management of failures to properly implement the quality assurance program. This pattern, it is alleged, presently demonstrates an attitude inconsistent with the principles of quality assurance"1472

531. We also noted in paragraph 252 that Consumers Power had agreed by stipulation not to contest the fact that

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See paragraph 252 supra.

certain deficiencies in soils work constituted a quality assurance breakdown in soils and we pondered what weight such a stipulation should be given in an evaluation of the then existing Consumers Power management attitude toward quality assurance. We found "little evidence that an inappropriate management attitude [had] perpetuated a 'pattern of frequency' of improper quality assurance implementation"1473 We also stated: "If our evaluation [of management attitude] 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."1474 We also placed considerable weight on specific evidence of positive management responses to the soils quality assurance deficiencies.1475

532. We have heard extensive evidence in the most recent phase of the QA hearings on errors of judgment and implementation made by or under the direction of Consumers Power. We repeat, if we are to draw any inferences from those deficiencies, we must also take into account the corresponding positive steps management took to remedy deficiencies. We find, despite the not inconsiderable numbers of QA problems experienced and the seriousness of some of those problems, that the present management attitude of Consumers Power is most convincingly demonstrated by the steps it has taken to remedy

1473 See paragraphs 253, 283 supra.

1474 See paragraph 284 supra.

1475 See paragraphs 256-257 supra.

QA problems. We also find that the specific programs now in place both in soils and balance of plant work demonstrate a serious and continuing concern for quality in the construction of the Midland plant.

533. First, we note that Consumers Power has, over the more than four years since the inception of this proceeding, taken a more and more active and involved role in the management of the quality aspects of this project. This involvement began with the takeover of the QA/QC program from the Zack Company on site, continued with the formation of MPQAD, in which Consumers took over the QA function from Bechtel, and continued with the most recent assumption of QC responsibility from Bechtel in both the soils and balance of plant areas.¹⁴⁷⁶

534. We also find the increasing level of senior management attention to the problems of the job encouraging. Mr. J. Cook and Mr. Howell testified concerning the reorganization of the upper management structure at Consumers Power which occurred in August of 1983. This reorganization was done for the purpose of bringing additional senior management attention and involvement to the Project.¹⁴⁷⁷ Mr. J. Cook retains full responsibility for the Midland Project and now devotes 100 percent of his time to the Midland effort.¹⁴⁷⁸ Mr. Wells states that Mr. J. Cook is highly supportive of the quality

1476 See paragraphs 44-49, 389-390, 451-454 supra.

1477 Howell, Tr. 20924.

1478 J. Cook, Tr. 20933. See also Harrison and R. Cook, Tr. 21162-21165; J. Cook, Tr. 21131.

functions.¹⁴⁷⁹ Mr. Howell now has direct line responsibility for the Midland Project supervising Mr. J. Cook. Mr. Howell reports to Mr. Selby. Mr. Howell explained, however, that Mr. J. Cook's responsibilities with respect to Midland have not diminished but rather that the reorganization would result in the allocation of additional senior management attention to and involvement in the Midland Project, since Mr. Howell will be able to devote a greater amount of time to the Midland Project than Mr. Selby has been able to in the past.¹⁴⁸⁰

535. In the area of remedial soils work, Mr. James Mooney has single point accountability for the soils work, and thus his testimony regarding senior management attention is most important for assessing Consumers Power's commitment to quality in remedial soils.¹⁴⁸¹ Mr. Mooney explained that in the soils area specifically, extensive high level senior management involvement from Mr. J. Cook and Mr. Selby continues.¹⁴⁸² Mr. Selby is briefed concerning progress at the plant at bi-monthly meetings and he is also kept informed of significant happenings at the site.¹⁴⁸³

536. We have also seen that Consumers Power has taken further steps to resolve lingering problems and differences

1479 J. Cook and Howell, Tr. 20926, Wells prepared testimony on quality assurance at pp. 2-3, following Tr. 18027.

1480 Howell, Tr. 20924-20927.

1481 Mooney, Tr. 17025.

1482 Mooney, Tr. 17086-17088, 17313.

1483 Id.

with the Staff regarding training and certification of QC inspectors. As we have noted supra, Consumers Power committed to a retraining and recertification program for QC inspectors. Initial differences between the Staff and Consumers Power over the viability of retraining former Bechtel QC supervisors in supervisory positions in the new QC organization have been resolved.¹⁴⁸⁴ Moreover, when the Staff voiced concern about QC retraining being rushed, Consumers Power took immediate action to alleviate the concern. Mr. Wells of Consumers Power testified that suspension of the retraining and recertification of QC inspectors was a result of recognition on the part of Consumers Power of a problem with the pace of retraining and recertification and in remedying that situation.¹⁴⁸⁵

537. We have also described the diesel generator building inspection and the other events leading up to the institution of the CCP. Consumers Power was responsible for initiating the CCP and halting most safety-related work at the site in December of 1982.¹⁴⁸⁶ The CCP was both conceived by and is being managed by Consumers Power.¹⁴⁸⁷ Mr. Keppler stated that prior to the time of the DGB inspection and the December, 1982 stop work, he would have rated Consumers Power's initiative negatively because of the amount of influence which

¹⁴⁸⁴ See paragraph 455 supra.

¹⁴⁸⁵ Wells, Tr. 18196-18197; see also, Gardner, Tr. 14481-14484. See paragraph 455 supra.

¹⁴⁸⁶ J. Cook, April 11, 1983 prepared testimony on quality assurance at pp. 2-5, following Tr. 18025.

¹⁴⁸⁷ Id. at p. 31.

the Staff had to exert over proposed actions such as the September 17, 1982 proposals for third party reviews.¹⁴⁸⁸ Since the DGB inspection and the stop work by Consumers Power in December of 1982, however, Mr. Keppler believes that Consumers Power's initiative has improved.¹⁴⁸⁹ Mr. Keppler credited Consumers Power with having taken the initiative in a number of other actions, some of which occurred prior to December of 1982, which he viewed as positive indications that he could have reasonable assurance that the plant will be completed properly. These include the appointment of Mr. Wells as head of MPQAD, the choice and retention of Stone & Webster for the third party overview for soils, and a number of the proposals included in the CCP.¹⁴⁹⁰

538. Based upon this record, we are of the opinion that Consumers Power has shown considerable initiative in responding to regulatory concerns on the Midland Project. The fact that Consumers Power adopted some changes that were based on NRC Staff recommendations is hardly evidence of poor management attitude. However, the fact that Consumers Power has shown sustained initiative toward improving performance at the plant is evidence of a good management attitude.

539. One set of events in which Consumers Power in the end demonstrated positive management attitude by taking

1488 Keppler, Tr. 15657-15658.
1489 Keppler, Tr. 15657-15658.
1490 Keppler, Tr. 15579-15581; see also Keppler, Tr. 15660.

vigorous steps to correct a problem, admittedly self inflicted, concerned the SALP II response. The NRC Staff justifiably criticized Consumers Power for having taken an argumentative approach in its original SALP II response. In the SALP II assessment, Consumers Power received a Category III rating in the following functional areas: (a) soils and foundations; (b) electrical power supply and distribution; (c) piping systems and supports; (d) design control and design changes; and (e) reporting requirements and corrective action.¹⁴⁹¹

540. A public meeting was held on April 26, 1982, at which time Mr. Keppler and members of the NRC Region III Staff met with Consumers Power Company personnel in Jackson, Michigan to present the Applicant with the observations and findings of the SALP II Board. At that meeting, both Mr. Keppler and Mr. R. Cook expressed their beliefs that the soils area had not shown any substantial improvement during the SALP II period of July 1, 1980 to June 30, 1981.¹⁴⁹²

541. On May 17, 1982, Consumers Power Company issued its first response to the SALP II report. In its response, Consumers Power took exception both to conclusions expressed in the report and to specifics enumerated therein. The response was argumentative in tone and contained incorrect information and statements which could not be fully defended when challenged.¹⁴⁹³

1491 Shafer, Tr. 14776; Stamiris Exhibit No. 55.

1492 Keppler, Tr. 15161-15162; see also Stamiris Exhibit No. 55.

1493 J. Cook, Tr. 18389-18390; Keppler, October 29, 1982 prepared testimony on quality assurance, Attachment B at p. 6, following Tr. 15111; Landsman, Tr. 14838.

542. At the request of Consumers Power, a second public SALP II meeting was scheduled for and held on June 26, 1982. The main thrust of the meeting was a discussion as to the apparent discrepancies between the position taken by the NRC inspectors and the Applicant's response.¹⁴⁹⁴ Consumers Power Company's position at the meeting corresponded with the representations made in its May, 1982 response. Both Mr. Keppler and Dr. Landsman expressed their displeasure with the SALP II response.¹⁴⁹⁵

543. As a result of the misunderstandings and differences of opinion demonstrated at the June, 1982 meeting, the Applicant reconsidered its response. An additional Staff/Consumers Power meeting was scheduled for August 5, 1982.¹⁴⁹⁶

1494 Landsman, Tr. 14838.

1495 Keppler, Tr. 15164, 15409; Landsman, Tr. 14838.

1496 Prior to that date, members of the Staff reviewed and formulated specific comments based on the Applicant's SALP II response. In his notes, Wayne Shafer indicated that he felt the Applicant had spent too much time trying to "justify its behavior" instead of determining why it hadn't met its original commitments. However, Mr. Shafer indicated that the comments he made were intended only for Staff use and were neither intended to be nor actually were conveyed to the Applicant in that manner. See Shafer, Tr. 14800-14801.

Mr. R. Cook also prepared comments in anticipation of the August 5 meeting. Mr. R. Cook felt that Consumers Power's May 17, 1982 response reflected negatively on the Applicant's Quality Assurance and management attitude because it rebutted in an argumentative fashion findings which the Staff felt were a fair assessment of Consumers Power performance. Mr. R. Cook also stated that he felt Consumers Power was responsive only to strong enforcement action. Mr. R. Cook's prepared comments stated that based on Consumers Power's response which stated that seven items of noncompliance (IONC) was not excessive, he felt the Applicant's attitude toward noncompliances could warrant removal of its license until the Company's management was completely purged. Mr. R. Cook noted, however, that Consumers Power Company had reconsidered its response relating to the SALP II Report, thereby rendering this a dead issue. See R. Cook, Tr. 15976-15977, 15969-15971, 15982-15983; see also Gardner, Tr. 14867.

544. Mr. J. Cook attributed the quality of the initial SALP II response to bad staff work.¹⁴⁹⁷ Mr. J. Cook immediately took steps both to improve the Staff work and repair the relationship with the NRC Staff. Following the June, 1982 SALP II meeting, Mr. J. Cook gave Mr. Wells responsibility for working out the concerns associated with Consumers Power's initial response to the SALP II report and developing a correct and temperate response.¹⁴⁹⁸ Consumers Power conducted a specific investigation of the facts in dispute. Under Mr. Wells' direction, Consumers Power acknowledged the criticisms brought against its initial response to the SALP II report and recognized that such criticisms were justified. Shortly thereafter, the individual responsible for drafting the first response was transferred to a position outside the project and Mr. Wells replaced him as head of MPQAD.¹⁴⁹⁹ We consider these actions to be evidence of a commitment to prompt and vigorous correction of mistakes.

545. At the August 5, 1982 meeting, Consumers Power informed the Staff that it was in the process of reevaluating and revising its SALP II response in light of the information received at meetings with the Staff and a more detailed review

1497 J. Cook, Tr. 18388-18390.

1498 J. Cook, Tr. 18391, 18699; Shafer and Gardner, Tr. 14867-14868, 14870-14871.

1499 See Keppler, Tr. 15577, 15660; Shafer, Tr. 16805; Wells, prepared testimony on quality assurance at p. 3 following Tr. 18027; Wells Tr. 18441-18445.

with its own personnel.¹⁵⁰⁰ Consumers Power ultimately sent a revised response which the Staff found acceptable.¹⁵⁰¹ During the hearings, Mr. J. Cook also stated that he considered it a "management failure" on his part to have sent the initial SALP II response.¹⁵⁰² We find this candor to be evidence of a forthright attitude conducive to recognizing and correcting errors.

546. A preliminary SALP III report, covering the period of July 1, 1981 through March 31, 1983, was issued on July 21, 1983. In that report, Consumers Power's soils and foundation work were once again determined to be a Category III under the SALP rating system.

547. In its September 6, 1983 response to the SALP III report, Consumers Power indicated that it was committed to taking whatever steps were necessary to achieve the quality performance level that both the NRC Staff and Consumers Power desire.¹⁵⁰³ Mr. Harrison of the NRC Staff testified that Consumers Power demonstrated a more positive attitude in responding to the SALP III report. He felt the SALP III response stood on its own as a "typical, positive SALP response."¹⁵⁰⁴ Mr. Harrison stated that he was encouraged by the Applicant's

1500 Gardner, Tr. 14868.

1501 Shafer, Tr. 14802.

1502 J. Cook, 18389-18390.

1503 Harrison, Tr. 20693-20695, 20698.

1504 Harrison, Tr. 20695.

response since he perceived a change in responses from argumentative to non-argumentative. Recognizing the problem and wanting to strive to achieve the recommendations of the Staff was deemed a very positive step forward in resolving the issues.¹⁵⁰⁵

D. Conclusion With Respect to
Management Attitude

548. We acknowledge the candor with which Consumers Power's management described the problems which have taken place at the Midland site. We find encouraging Consumers Power's initiatives in developing the programs necessary to achieve compliance with regulatory requirement. Objective evidence of Consumers Power's positive management attitude includes the creation of the soils project, the integration of QC into MPQAD, the development of the CCP, and increased receptivity to criticisms and recommendations of the NRC Staff as shown by the revised SALP II response and the SALP III response. Management has not only been receptive to NRC concerns, but has also taken initiative to improve QA/QC and to improve communications between Consumers Power and the NRC. Senior management involvement in the Midland Project is extensive and management personnel are committed to quality at the Midland Site. Extraordinary efforts are being made by Consumers Power to complete both the remedial soils work and the balance of plant work in conformance with regulatory requirements. We also find no

¹⁵⁰⁵ Harrison, Tr. 20775.

evidence whatsoever of any willful failure to adhere to regulatory requirements.

549. During the testimony, we heard a number of expressions of subjective judgments by members of the NRC Staff as to Consumers Power's management attitude. Subjective evidence of attitude is inherently unreliable, constituting as it does one person's mental impression of another person's state of mind. Moreover, the import of the word "attitude" is difficult to ascertain, and ascribing a single "attitude" to a loosely defined corporate body, "management," which is really a collection of individuals, is at best difficult. Thus, we find these expressions, though sincere and well intended, to be minimally probative with respect to the likelihood of future acceptable performance compared to the testimony about the remedial measures we have discussed.

550. We have also noted that the term "inattention to detail" was used to describe one of the causes of the soils problems. Indeed, a Staff witness in the earlier round of hearings believed that inattention to detail reflected adversely on Consumers Power's management attitude. This term has also recurred repeatedly during the most recent round of hearings and has been ascribed as a "root cause" of the continuing problems at Midland, both in soils and in balance of plant. Since, however, we find the term "inattention to detail" to be little more than a tautology for "mistakes with respect to details", we find this term of little use in analyzing the

management attitude of Consumers Power in the quality assurance program at Midland.

551. The Board finds that Consumers Power has a management attitude which is committed to completing the Midland Plant in conformity with all regulatory requirements. We are therefore convinced that Consumers Power has a management attitude which is, overall, satisfactory.

E. Stamiris Contention 1(d)

552. Stamiris Contention 1(d) states:

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:

. . .

(d) the failure to provide adequate acceptance criteria for remedial actions in response to 10 CFR §50.54 (f) requests (as set forth in Part II of the Order of Modification)

and this managerial attitude necessitates stricter than usual regulatory supervision (ALAB-106) to assure appropriate implementation of the remedial steps required by the Order Modifying Construction Permits, dated December 6, 1979. 1506

553. In her answer to Applicant's interrogatories dated April 20, 1981, Ms. Stamiris admitted:

1506 Stamiris Contention 1(d).

ID. I am not familiar with each of the acceptance criteria provided by CPCo, nor do I consider myself qualified to comment on their geotechnical merits. Rather, I consider Consumer's failure to provide necessary information such as this, as virtual defiance of the regulatory process. The Applicant has said (in these 50-54f g. on acceptance criteria, in FSAR Q. on geologic classification, and at their 8/29/80 meeting to appeal the additional boring requests) that they do not agree that the information requested by the NRC is necessary. The regulatory agency must be the sole judge of what information is or is not necessary to its ultimate purpose of protecting public safety interests. By questioning the judgment of the regulators in this way, CPCo has failed to provide adequate acceptance as requested. 1507

554. Stamiris Contention 1(d) was not specifically addressed in the parties' 1981 proposed findings on quality assurance and management attitude issues because we anticipated further evidence addressing the technical adequacy of the acceptance criteria proposed by Applicant for its remedial measures.¹⁵⁰⁸ However, since that time Applicant and the Staff have entered into stipulations by which Applicant has agreed not to contest that as of December 6, 1979, the NRC Staff had insufficient information to evaluate Applicant's proposed remedial actions. In these stipulations, Applicant also agreed not to contest that the absence of such information constituted an adequate basis for the issuance of the December 6, 1979

1507 Intervenor (Stamiris) answers to Applicant's Interrogatories, dated April 20, 1981.

1508 See Memorandum (Concerning Telephone Conference Call of September 25, 1981 and Applicant's Motion for Partial Decision) dated October 2, 1981 at p.5.

Modification Order.¹⁵⁰⁹ The effect of these stipulations was to allow the Applicant and the Staff to focus their evidentiary presentations on the adequacy of the remedial measures as they existed on the date of the hearings, rather than on the historical issue of the adequacy of remedial measures proposed as of December 6, 1979.¹⁵¹⁰

555. Applicant has never conceded, however, that the reasons why the NRC Staff had insufficient information concerning remedial measures as of December 6, 1979 was because of "less than complete and candid dedication to providing [such] information ..." on the part of Applicant.¹⁵¹¹ Indeed, the evidence in the record effectively rebuts this assertion. Prior to December 6, 1979, Consumers Power Company's management assumed that the answers to 50.54(f) questions submitted up to

¹⁵⁰⁹ See Joint Exhibit No. 2 (auxiliary building), Joint Exhibit No. 3 (BWSTs and underground piping), Joint Exhibit No. 4 (SWPS), Joint Exhibit No. 5 (DGB).

The language in our stipulation for the diesel generator building differs somewhat from that in the other stipulations. Among other things, this is attributable to the fact that the remedial measures for the DGB had already been carried out before December 6, 1979. See also Hood, Tr. 10613-10616; Weidner, Tr. 10902-10904.

¹⁵¹⁰ Applicant's proposals for some of the remedial measures changed after December 6, 1979, in part because of further NRC Staff review, in part because of the increased seismic design basis for such remedial actions proposed in the October 14, 1980 Tedesco letter. Holt Exhibit No. 3. See Applicant's Proposed Findings of Fact and Conclusions of Law on Remedial Soils Issues, dated August 5, 1983, at paragraphs 51-51, 231 (as corrected in Applicant's January 3, 1984 Reply to the NRC Staff's Responsive Findings.)

¹⁵¹¹ See Keeley, prepared testimony at pp. 11-15, following Tr. 1163; see also paragraphs 107-120, 139 supra.

that time, as well as the information provided in 50.55(e) reports, were adequately responsive to the information the Staff required for technical adequacy.¹⁵¹² The Staff had not informed Applicant otherwise.¹⁵¹³

556. In addition to citing "50.54(f) questions on acceptance criteria", Ms. Stamiris' April 20, 1981 interrogatory answer refers to "FSAR questions on geologic classification" in support of Contention 1(d). That subject has already been addressed in connection with Stamiris Contention 1(b) in paragraphs 91-94 supra.

557. The third reference in Ms. Stamiris' April 26, 1981 interrogatory response is to Applicant's 1980 appeal to NRC Staff management of the NRC Staff's request for additional borings.¹⁵¹⁴ This Licensing Board has already ruled with respect to this contention that an applicant's exercise of its legal rights may not be the basis for condemnation, absent some

¹⁵¹² On November 19, 1979 the Staff had sent 50.54(f) Questions 24-35, which were received by Applicant on November 26, 1979. The answers to these questions were not due by December 6, 1979. Keeley, prepared testimony at p. 14, following Tr. 1163.

¹⁵¹³ See paragraphs 109, 112-113, 116, 120-121 supra.

¹⁵¹⁴ Applicant does not believe this "example" is properly within the scope of Stamiris Contention 1(d) because the NRC Staff request for additional borings came after the December 6, 1979 Modification Order. Moreover, we believe Ms. Stamiris has withdrawn this issue from litigation since she withdrew corresponding contentions 2(e) and 5 by letter dated June 1, 1981. Nevertheless, Applicant tenders proposed findings on this subject without waiving any legal objection.

indication that such exercise was motivated by improper considerations.¹⁵¹⁵

558. In this instance, the motive for Applicant's appeal was that its consultant Dr. Ralph Peck, a world-renowned authority on soils engineering, expressed his conviction that these borings were not necessary, and in fact, were likely to produce undependable data.¹⁵¹⁶ This was an opinion which Dr. Peck continued to express in these hearings.¹⁵¹⁷

559. The NRC Staff geotechnical reviewer, while strongly disagreeing about the need for the additional borings, did not believe Applicant's appeal reflected adversely on Consumers Power's management attitude.¹⁵¹⁸ Applicant eventually accommodated the Staff's request for additional borings and the results were used by the NRC Staff in its review.¹⁵¹⁹

¹⁵¹⁵ Prehearing Conference Order Ruling on Contentions and on Consolidation of Proceedings, dated October 24, 1980 at pp. 5-6.

¹⁵¹⁶ See J. Cook, prepared testimony at pp. 19-21, following Tr. 1693.

¹⁵¹⁷ R. Peck, prepared testimony on DGB surcharge at p. 80, following Tr. 10180; R. Peck, Tr. 3362-3364. See also Applicant's Proposed Findings of Fact and Conclusions of Law on Remedial Soils Issues, dated August 5, 1983, at paragraph 133 and n. 251.

¹⁵¹⁸ Kane, Tr. 4149-4150.

¹⁵¹⁹ See e.g., SSER #2 (Staff Exhibit No. 14), §2.5.4.4.2 at p. 2-31; J. Cook, prepared testimony at pp. 19-20, following Tr. 1693.

560. The Licensing Board concludes that Applicant's decision on the basis of its consultant's advice to appeal the Staff's request for additional borings was not improperly motivated. Insofar as this incident is within the scope of Stamiris Contention 1(d), we find it to be without merit. Overall, we find that the references in Stamiris Contention 1(d) and the corresponding interrogatory response do not demonstrate a less than complete and candid dedication to supplying information.

VI. ALLEGATIONS AND INVESTIGATIONS

A. Allegations of a Material False Statement: The Cable Pulling Incident

561. Consumers Power and the NRC Staff began discussing the extent to which quality assurance requirements would be applied to the proposed underpinning work and how those requirements would be implemented in late 1981 or early 1982. Subsequently, NRC Staff members Dr. Landsman and Mr. R. Cook accused the Bechtel Assistant Project Manager, Alan Boos, of having made false statements in a meeting and in a conference call relating to quality assurance requirements. The Staff allegations triggered an investigation by a Region III investigator (now a member of the Office of Investigations), Charles Weil. Mr. Weil issued his Investigation Report on September 14, 1982.¹⁵²⁰ Region III issued the Report under a cover letter from Mr. Keppler dated January 18, 1983 which stated: "While the investigation failed to provide conclusive evidence that a material false statement was made with respect to the status of the underpinning instrumentation, several members of my staff believed they were misled by remarks made by Consumers Power Company and Bechtel employees during the meeting in Washington, D.C., on March 10 and the subsequent telephone call on March 12, 1982."¹⁵²¹ We heard testimony on the allegations of misleading statements from Staff witnesses and from Consumers Power witnesses.

1520 Staff Exhibit No. 22.

1521 Id.

From the testimony of the various witnesses, we are able to piece together the following summary of the facts.

562. The Bechtel engineers and their consultants who developed the program for conducting the underpinning work for the auxiliary building originally broke the work down into three "phases."¹⁵²² Phase 1 encompassed preparatory work, including, inter alia, freeze wall installation and activation, construction dewatering, and partial excavation of access shafts at the ends of the electrical penetration wings of the auxiliary building.¹⁵²³ The excavation of the access shafts was the initial step of the underpinning, but Phase 1 work encompassed only excavation down to elevation 609. This elevation marked the end of Phase 1 work because excavation beyond that point would involve tunnelling under the turbine building and undermining support of the feedwater isolation valve pit and the electrical penetration area.¹⁵²⁴

563. Under the then existing plans, Phase 2 work could not proceed before the necessary instrumentation to monitor auxiliary building movement was in place.¹⁵²⁵ The

¹⁵²² See generally Burke, Corley, Gould, Johnson and Sozen, prepared testimony regarding remedial measures at pp. 14-29, following Tr. 5509.

¹⁵²³ See generally, Appendix I of SSER #2, (Staff Exhibit No. 14) dated October, 1982.

¹⁵²⁴ See generally Id.; Burke, Corley, Gould, Johnson and Sozen, prepared testimony regarding remedial measures at pp. 18-27, following Tr. 5509; Burke, Tr. 5536-5540.

¹⁵²⁵ See generally Burke, Corley, Gould, Johnson and Sozen, prepared testimony regarding remedial measures at p. 29, following Tr. 5509; Mooney and Wheeler, prepared testimony concerning the alleged violations of the April 30 ASLB Order and the March 1982 cable-pulling incident at p. 12, following Tr. 19983.

required instruments were both absolute movement detectors which used deepseated bench marks as references and differential movement detectors which measured differential movement between, e.g., the electrical penetration wing and the containment.¹⁵²⁶ The number and locations of monitoring instruments changed during the time period in question, and the final number and locations of all monitoring instruments which the NRC Staff eventually required were not determined until after the alleged material false statements occurred.¹⁵²⁷

564. The meeting at issue and the related telephone conversation took place on March 10 and March 12, 1982 respectively. Many subjects were discussed in addition to instrumentation locations and status. At the time of the March 10 meeting and March 12 telephone call, the construction drawings called for 21 instrument locations, 10 of which needed to be installed prior to the start of Phase 2 work.¹⁵²⁸ Two of these 10 locations utilized only mechanical instruments with no electrical output.¹⁵²⁹ The other eight were electrical instrument locations and required 30 cables.¹⁵³⁰ It is clear in

1526 Burke, Corley, Gould, Johnson and Sozen, prepared testimony regarding remedial measures at pp. 32-34, following Tr. 5509; Burke, Tr. 5524-5525.

1527 See paragraph 586, infra.

1528 Black, prepared testimony at p. 6, following Tr. 19778; Glass, prepared testimony at pp. 3-4 and Ex. 1, following Tr. 19790.

1529 Id.

1530 Black, prepared testimony at pp. 13-14, following Tr. 19778; Glass, prepared testimony at pp. 7-8, following Tr. 19790.

retrospect, although it was not understood at the time, that Bechtel and Consumers Power personnel thought of instrument installation as Phase 1 work because it was necessary for the start of Phase 2, and that the NRC Staff considered instrumentation installation to be the initial part of Phase 2 work.¹⁵³¹

565. According to the testimony of Dr. Landsman, during February of 1982 he had a number of unsatisfactory exchanges with Consumers Power over the application of Quality Assurance requirements to underpinning work.¹⁵³² For example, the soldier piles supporting the walls of the access shaft were to be partly a Q installation and partly a non-Q installation because the line of demarcation between Q and non-Q soil as it then existed ran through the area of the shaft excavation. Dr. Landsman believed that these types of distinctions were unnecessary and that all of the work should be Q.¹⁵³³ Consumers Power, on the other hand, maintained the position that only work directly under Q structures, or which became part of the permanent support for Q structures, had to be Q.¹⁵³⁴ Dr.

1531 Mooney and Wheeler, prepared testimony concerning the alleged violations of the April 30 ASLB Order and the March 1982 cable-pulling incident at p. 12, following Tr. 19983; Boos, 20119-20120; Staff Exhibit No. 22, Exhibit XII at pp. 2-3; Hood, Tr. 17761.

1532 Dr. Landsman believed that these disputes were the result of a concern on the part of Applicant that the NRC Staff would write a large number of noncompliances in the soils remedial work if QA requirements were applied to all of the underpinning work. Landsman, Tr. 17474. Mr. R. Cook further explained this concern by giving an example. The example he gave concerned whether quality requirements would be required for the procurement of wood. R. Cook, Tr. 17478-17479.

1533 Landsman, Tr. 17435, 17480, 17896.

1534 Staff Exhibit No. 22, Exhibit XIV.

Landsman (and others) wanted QA requirements to be applied to all work activities in soil within a broad perimeter around the safety-related buildings, including all underpinning work.¹⁵³⁵

566. In order to resolve the dispute, Dr. Landsman requested NRR to convene a meeting with the Applicant at which the NRC Staff would state its position.¹⁵³⁶ NRR arranged an all day meeting on March 10, 1982. Consumers Power, apparently in anticipation of the NRC Staff's position, came into this meeting with an intermediate position in which it proposed that work under Q structures or which would constitute permanent support for Q structures would be Q, and other work connected with the underpinning would fall into a new category which CPCo called "QA". The essence of the "QA" designation was that work in this category would be covered by the QA/QC program but the NRC Staff would not be permitted to cite the Applicant for violations or deviations from requirements in this work.¹⁵³⁷

567. After lengthy discussion, the Staff recessed the meeting in order to caucus. During the recess, in addition to coming to a consensus at the working level that Consumers Power's proposal should be rejected, Darl Hood, the NRR project manager for Midland, and others, reviewed their decision with Mr. Vollmer who concurred with the decision.¹⁵³⁸ The review by

1535 Landsman, Tr. 17427, 17435, 17896.

1536 Landsman, Tr. 17436, 17673.

1537 Staff Exhibit No. 22, Exhibit XIV; Landsman, Weil and R. Cook, Tr. 17467-17473.

1538 Hood, Tr. 17783-17784.

Mr. Vollmer left only Mr. Denton as a possible avenue of appeal within the NRC Staff.¹⁵³⁹

568. When the Staff returned to the meeting, Mr. Hood informed Consumers Power that the Staff rejected the Applicant's proposal and would require all underpinning work to be Q,¹⁵⁴⁰ regardless of location and irrespective of whether temporary or permanent. There is no evidence, however, that the Staff conveyed to Consumers Power that NRC management personnel had already reviewed and approved the working Staff's position, thereby preempting at least some of the possible levels of appeal for Consumers Power within the Staff.¹⁵⁴¹ Thus the testimony of Mr. Mooney that he had to confer with others in Consumers Power management before committing to the NRC position and that he believed that the Applicant had avenues of appeal within the Staff is understandable despite the Staff's apparent belief that there could be no further change in the Staff position.¹⁵⁴²

569. During the discussion, Mr. Hood, who was speaking for the Staff, indicated that the Staff's position was that from that date forward all underpinning work was to be Q.¹⁵⁴³ At that point in the meeting, Mr. Boos remarked that he had to call the site and stop all underpinning work immediately be-

1539 Hood, Tr. 17942-17943.

1540 Hood, Tr. 17784.

1541 Boos and Mooney, Tr. 20005-20008.

1542 Boos and Mooney, Tr. 20005-20006, 20041-20042.

1543 Landsman, Tr. 17427.

cause of the Staff's decision.¹⁵⁴⁴ Mr. Hood indicated that he had not meant the Staff's position to be so draconian. Rather, he indicated, the Staff meant that the requirement that work be ² did not attach to ongoing work and really did not come into play until Phase 2 work commenced.¹⁵⁴⁵ It is clear in retrospect that this dual criterion set forth by Mr. Hood in the heat of the meeting caused no small part of the ensuing confusion. It appears, for example, that at least one Staff member, Dr. Landsman, did not remember any discussion regarding the difference between Phase 1 and Phase 2 at all.¹⁵⁴⁶ It is clear from his meeting notes, however, that Mr. Hood himself emphasized that Phase 1 - Phase 2 distinction.¹⁵⁴⁷ As an illustration of what the Staff exempted from its March 10th decision, the example was given by Dr. Landsman that excavation and installation of supports for access shafts could be completed down to elevation 609, the end of Phase 1 excavation.¹⁵⁴⁸

570. The Consumers Power and Bechtel personnel present at the meeting did not immediately apprehend precisely how the decision as expressed was to be applied.¹⁵⁴⁹ Dr. Landsman's example of the access shafts may have caused additional con-

1544 Landsman, Tr. 17427-17428; Boos, Tr. 20002-20003.

1545 Hood, Tr. 17757; Boos, Tr. 20003; Mooney Tr. 20131.

1546 Landsman, Tr. 17434-17435.

1547 Staff Exhibit No. 22, Exhibit XIV.

1548 Id.; Landsman, Tr. 17427-17428, 17768-17769.

1549 Mooney and Wheeler, prepared testimony concerning the alleged violations of the April 30 ASLB Order and the March 1982 cable-pulling incident at pp. 10-12, following Tr. 19983.

fusion, because Dr. Landsman interpreted it as an example, and indeed the only example, of "ongoing work," but the example is equally susceptible to interpretation as being part of Phase 1 work.

571. At this point, the testimony diverges as to what was said at the meeting. Staff witnesses Dr. Landsman and Mr. R. Cook testified that Mr. Boos described the status of underpinning instrument installation in such a manner as to give them the impression that the activity was nearly complete. However, neither witness could recall the words Mr. Boos used.¹⁵⁵⁰ Mr. Hood did not recall any specific statements regarding instrument status.¹⁵⁵¹ In fact most of the people interviewed by Mr. Weil could not recall any discussion of instrumentation at all.¹⁵⁵² According to Mr. Boos, he had not gone to the meeting intending to discuss instrument installation scheduling; whatever mention was made of instrumentation was in the course of discussing the Q vs. non-Q question.¹⁵⁶³ The only other Staff member to have a specific memory of Mr. Boos' statements did not testify in the hearing but stated in his sworn statement to the investigator: "During the course of the March 10 meeting I do recall a statement by Mr. A. Boos that indicated that monitoring instrumentation had been installed.

1550 Landsman and Cook, Tr. 17427-17429; Landsman, Tr. 17780.

1551 Hood, Tr. 17762-17765.

1552 Weil, Tr. 17429.

1553 Boos, Tr. 19999-20000. See also Mooney, Tr. 20001.

This statement was given by Mr. Boos as a side comment to the main discussion which was focused on Q-listing of important underpinning operations. In my opinion the statement by Mr. Boos was given as a status of instrumentation installation in a very general sense and was not intended to specifically identify the instrumentation which had already been installed."¹⁵⁵⁴

572. After the meeting, Consumers Power and Bechtel personnel were still uncertain as to how the Staff position would apply to specific work activities.¹⁵⁵⁵ As a result, Mr. Boos had a draft table prepared which showed Consumers Power's and Bechtel's understanding of what work would be Q and what work non-Q. Included on this table was an entry which showed instrumentation installation as non-Q, with instrumentation checkout and calibration being Q.¹⁵⁵⁶

573. On Friday, March 12, after the regular weekly project meeting, representatives of Consumers Power and Bechtel initiated a conference call to the Region III Staff in Glen Ellyn, Illinois.¹⁵⁵⁷ Dr. Landsman and Mr. Boyd were present in Glen Ellyn during the phone call, and Mr. R. Cook was present at the Consumers Power/Bechtel end of the call. Mr. Boos and other representatives from Bechtel and Consumers Power were present during the telephone call.¹⁵⁵⁸ At Consumers Power's

1554 Staff Exhibit No. 22, Exhibit XV at p. 1.
1555 Mooney, Tr. 20008.
1556 Boos and Mooney, Tr. 20008-20012.
1557 Mooney, Tr. 20008; Boos, Tr. 20064.
1558 Staff Exhibit No. 22, Exhibit I at p. 1.

request, a secretary took shorthand notes from which she typed a nearly verbatim transcript of the telephone conversation.¹⁵⁵⁹

574. Mr. Boos opened his discussion with a statement which included the following: "[O]ne of the first things we did this morning was to draw up a list of those items which either have been completed or [are] in process or are proposed which we feel can, in fact, be treated as non-Q items "(emphasis added).¹⁵⁶⁰ Later in the call, in the course of stating that monitoring instrument installation would be non-Q but checkout of the system would be Q, Mr. Boos stated: "Our instrumentation is essentially well under way. Wiring has been pulled - raceway has been installed, etc."¹⁵⁶¹

575. On March 17, Dr. Landsman and Mr. Gardner began a three day inspection of the remedial soils work. On March 17 or 18, these inspectors visited the Data Acquisition Room on the roof of the auxiliary building where the monitoring equipment for the settlement instrumentation was to be located.¹⁵⁶² With them was Michael Schaeffer, MPQAD Electrical/Instrumentation and Controls Section Head. Mr. Schaeffer had not been involved with the underpinning instrumentation before and knew nothing about it, since it had not come under MPQAD's purview.¹⁵⁶³ He indicated to Dr. Landsman and Mr. Gardner a total

1559 Mooney, Tr. 20009.

1560 Staff Exhibit No. 22, Exhibit I at p. 1.

1561 Id. at p. 6.

1562 Staff Exhibit No. 22, Exhibit IV at p. 1.

1563 Boos and Mooney, Tr. 20135.

lack of knowledge of any quality control or quality assurance requirements for the instrumentation installation.¹⁵⁶⁴ In Mr. Schaeffer's words from his sworn statement to the NRC Investigator: "My response to Mr. Gardner ['s inquiry about quality requirements] was that I was totally unaware that the Electrical Metallic Tubing (EMT)/Conduit and cable pulling installation activities concerning Instrumentation for the Underpinning were Q, or under the Midland Project Quality Assurance Program. Immediately after my conversation with Mr. Gardner, I started inquiring about the subject with the MPQAD Soils Group and learned that Consumers Power Company believed these activities were non-Q (not under the Midland Project Quality Assurance Program) and that the NRC believed that these activities were Q-listed."¹⁵⁶⁵

576. Dr. Landsman indicated in his statements to the investigator and in his oral testimony that Mr. Schaeffer told him that cable pulling for the instrumentation had begun on March 11, 1982 (one day after the March 10 meeting).¹⁵⁶⁶ According to Mr. Weil, Mr. Schaeffer did not recall making such a statement to Dr. Landsman.¹⁵⁶⁷ However, assuming that Mr. Schaeffer did make the statement alluded to, other testimony

1564 Gardner, Tr. 17819-17821.

1565 Staff Exhibit No. 22, Exhibit VIII at p. 1.

1566 Staff Exhibit No. 22, Exhibit II at p. 2; Landsman, Tr. 17674-17675. See also, Staff Exhibit No. 22, Exhibit IV at p. 1.

1567 Weil, Tr. 17677.

to be discussed infra indicates that he was wrong, i.e., that cable pulling actually started much earlier than March 11.

577. Mr. Gardner indicated that he determined by visual observation on March 17 that approximately 10% of the instrumentation cables or somewhere around 16 cables had been pulled.¹⁵⁶⁸ Dr. Landsman and Mr. R. Cook testified that they observed on that day that approximately 8 to 10 cables out of approximately 160 had been installed.¹⁵⁶⁹ However, there was no indication that they had counted cables precisely, and Mr. R. Cook acknowledged that there could have been as many as 16 cables installed at that time.¹⁵⁷⁰ Mr. Schaeffer, who also observed the installation, indicated that approximately 20% of the instrumentation system, including not only cable and conduit but also data acquisition computer and peripherals, power supply, and terminal boards had been installed as of March 18.¹⁵⁷¹ According to the NRC Investigator's report, evidently based on an interview with Bechtel Field Engineer Richard Black, 32 cables had been pulled and 16 of those had been removed from the Data Acquisition Room as of March 19, 1982.¹⁵⁷²

¹⁵⁶⁸ Staff Exhibit No. 22, Exhibit IV at p. 1; Gardner, Tr. 17819-17821, 17910-17912.

¹⁵⁶⁹ Landsman, Tr. 17430-17431, 17910; R. Cook, Tr. 17910-17911.

¹⁵⁷⁰ See R. Cook, Tr. 17910-17911.

¹⁵⁷¹ Staff Exhibit No. 22, Exhibit VIII at pp. 1-2.

¹⁵⁷² Staff Exhibit No. 22 at p. 10.

578. One of the difficulties in interpreting the percentage estimates of Dr. Landsman and Mr. Gardner is that the required total number of instrument cables was changing during the time period in question. As we conclude from testimony discussed above, 30 cables were originally required for the Phase 2 underpinning. As of a March 8 telephone call with NRR, CPCo had committed to some unknown number of additional instruments and cables, but these were not yet reflected in the "matrix" drawing (C-1493) used by the field engineers to govern installation.¹⁵⁷³ By March 17, according to Mr. Swanberg's statement to the Investigator, 159 cables were required.¹⁵⁷⁴ As of March 30, according to Mr. Black's statement to the investigator, 213 cables were required for the complete instrumentation system.¹⁵⁷⁵ It appears, therefore, that even as of the March 10 meeting, the required number of cables had increased but this new information had not been communicated to field personnel, at least in construction drawings.¹⁵⁷⁶

579. Dr. Landsman and Mr. R. Cook concluded from their and Mr. Gardner's observations on March 18 that they had been misled by statements in the March 10 meeting and in the March 12 telephone call.¹⁵⁷⁷ Their conclusion triggered an

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- 1573 Hood, Tr. 17751-17755; Glass, Tr. 19911-19913.
1574 Staff Exhibit No. 22 at pp. 10-11.
1575 Id. at p. 10.
1576 Glass, Tr. 19911-19913.
1577 Landsman and Cook, Tr. 17514-17516, 17530-17534.

investigation by then Region III Investigator Charles H. Weil. Mr. Weil testified orally, and in substance agreed with Dr. Landsman and Mr. Cook that Mr. Boos had "lied" at the meeting and in the telephone call.¹⁵⁷⁸ By "lying" Mr. Weil indicated that he meant only that Mr. Boos had made a factually incorrect statement, not that he had intended to mislead.¹⁵⁷⁹ Both Mr. R. Cook and Dr. Landsman indicated a belief that Mr. Boos had possibly intentionally misled the Staff. Mr. R. Cook based this belief on his view that Mr. Boos was an authoritative source who should have known the truth.¹⁵⁸⁰ However, both Mr. R. Cook and Dr. Landsman were reluctant to testify that Mr. Boos had deliberately misled them.¹⁵⁸¹ We conclude from other evidence, however, that even Mr. Weil's interpretation of Mr. Boos' statements is incorrect.

580. Consumers Power presented testimony of two Bechtel Field Engineers, Richard T. Black and Pamela S. Glass, who had supervisory responsibility for the installation of the conduit and cable for the underpinning instrumentation. Mr. Black as lead raceway engineer supervised the installation of conduit and cable, and Ms. Glass was a subordinate supervisor under Mr. Black.¹⁵⁸² According to Mr. Black, his first involve-

1578 Weil, Tr. 17696-17697.

1579 Id.

1580 Tr. 17875-17880.

1581 Landsman and Cook, Tr. 17530-17534.

1582 Black, prepared testimony at p. 1, following Tr. 19778; Glass, prepared testimony at p. 2, following Tr. 19790.

ment in the instrumentation work was a meeting on February 8 in Mr. Velanzano's office, at which Mr. Black received information about the planned instrument installation, including the fact that the instrumentation was temporary, i.e., only to be installed for 18 months, and the fact that the instrumentation was a non-Q installation.¹⁵⁸³

581. A memorandum dated February 11, 1982 from J. Fisher to L.E. Davis indicated that as of that date Bechtel needed to install instruments at 10 locations in order for Phase 2 work to begin.¹⁵⁸⁴ Further, the constraints of the then projected start of Phase 2 work and the time needed for installing and baselining instrumentation dictated a completion (or near completion) date for conduit and wiring for the required instruments of March 1. Later, according to the testimony of Mr. Boos and Ms. Glass, the date for completion of the wiring slipped to March 7 or 8.¹⁵⁸⁵ Mr. Black and Ms. Glass testified that the conduit and cable installation met or nearly met this target date.¹⁵⁸⁶ Mr. Black also testified that at least by February 20, some raceway (conduit and related fixtures) had been installed.¹⁵⁸⁷ Material withdrawal slips

¹⁵⁸³ Black, prepared testimony at pp. 3-4, following Tr. 19778; Tr. 19910-19911.

¹⁵⁸⁴ Black, Tr. 19865; Consumers Power Exhibit No. 56; see also Black, Tr. 19865-19866.

¹⁵⁸⁵ See Boos, Tr. 19985-19994; Glass, prepared testimony at p. 4, following Tr. 19790.

¹⁵⁸⁶ Glass and Black, Tr. 19898-19903.

¹⁵⁸⁷ Black, prepared testimony at p. 9, following Tr. 19778.

confirm that at least by February 21 conduit installation had begun.¹⁵⁸⁸ Both Mr. Black and Ms. Glass testified that actual cable pulling began either the day the cable arrived on site or the day after.¹⁵⁸⁹ The delivery receipt shows that the cable arrived on February 26, 1983, making the latest possible starting date for cable pulling February 27.¹⁵⁹⁰

582. Mr. Black also testified that he attended two weekly project meetings, one on March 5, and one, judging from the circumstances, which must have been on March 12. Mr. Boos was present at both meetings.¹⁵⁹¹ At the March 5 meeting, Black said, he informed those present at the meeting, including Mr. Boos, either directly or through Mr. Simpson, that he expected the cable installation for the 8 electrical instrument locations then thought needed to start Phase 2 to be completed by March 7.¹⁵⁹² At the second meeting on March 12, he informed those present, including Mr. Boos, that all these cables had been pulled.¹⁵⁹³ Mr. Black testified that the conduit installation and cable pulling for those locations was completed at least by March 10 and possibly as early as March 8.¹⁵⁹⁴

1588 Glass, Tr. 19793-19795; Consumers Power Exhibit No. 54; Glass, prepared testimony at pp. 5-6, following Tr. 19790.

1589 Black, prepared testimony at p. 11, following Tr. 19778; Tr. 19905-19907.

1590 Id. at p. 11 and Exhibit 3.

1591 Id. at pp. 12-13.

1592 Id.

1593 Id. at pp. 13-14.

1594 Black, Tr. 19901-19903.

583. Ms. Glass and Mr. Black also testified that because of an interference with a wall of the turbine building penthouse, cable from the instruments on the east electrical penetrating wing, which had to pass along the north wall of the penthouse, had to be pulled back from the Data Acquisition room in order to allow removal and relocation of the conduit.¹⁵⁹⁵ Mr. Black testified that this pullback occurred between March 12 and March 18 and that he did not learn of it until after the March 12th meeting.¹⁵⁹⁶ Ms. Glass, who later surveyed the work in May of 1982, testified that the work at the time of her survey was in the same condition as it was on the shutdown date, March 19, and that approximately half of the previously installed cables had been pulled back from the data acquisition room and coiled on the roof of the turbine building.¹⁵⁹⁷ This left approximately fifteen cables remaining in the data acquisition room.¹⁵⁹⁸

584. We conclude from all the evidence before us that these 15 cables were present in the Data Acquisition Room when Dr. Landsman, Mr. Gardner, and Mr. Schaeffer viewed them. We also conclude from all the evidence that cable pulling for the

¹⁵⁹⁵ Black, prepared testimony at pp. 14-15, following Tr. 19778; Glass, prepared testimony at pp. 6-8, following Tr. 19790.

¹⁵⁹⁶ Black, prepared testimony at p. 16, following Tr. 19778; Black, Tr. 19924-19925.

¹⁵⁹⁷ Glass, prepared testimony at pp. 7-8, following Tr. 19790; Tr. 19904.

¹⁵⁹⁸ Black, prepared testimony at p. 16, following Tr. 19778.

eight electrical instrument locations then perceived to be necessary for Phase 2 was complete by at least March 10.

585. Dr. Landsman's and Mr. R. Cook's account of what Mr. Boos said at the March 10 meeting cannot be given much weight because, by their own testimony it was their subjective impression of what had been said rather than their firm recollection of what had objectively transpired.¹⁵⁹⁹ Dr. Landsman in particular failed completely to recall Mr. Hood's use of a Phase 1 vs. Phase 2 criterion for applying Q controls to work in addition to the "ongoing work."¹⁶⁰⁰ The most we can conclude is, from Mr. Kane's written statement in the Investigation Report, that Mr. Boos at the meeting alluded to instrumentation status without trying to give a definitive status of the state of the work.¹⁶⁰¹

586. There is no controversy at all about what Mr. Boos said in the March 12 telephone call -- the transcript shows that he stated that instrumentation was "essentially well under way."¹⁶⁰² Mr. Boos testified that instrumentation consisted of several activities in addition to conduit installation and cable pulling, such as monitoring equipment installation, instrument installation, and termination.¹⁶⁰³ Mr. Boos

1599 Landsman, R. Cook and Weil, Tr. 17428-17429.

1600 Landsman, Tr. 17434-17435.

1601 Staff Exhibit No. 22, Exhibit XV.

1602 Id. at Exhibit 1 at p. 6.

1603 Boos, Tr. 20026-20028, 20077, 20083-20084.

testified that, even computing on the basis of the increased number of instruments known to be needed by March 12, taking into account all work that had been done by that date, one third to one half of the instrumentation work was complete as of that date.¹⁶⁰⁴ He testified that he considered this state of work to be well described by the term "well underway," and apologized for the addition of the work "essentially" as possibly bad diction but not changing the meaning of the phrase or making it misleading.¹⁶⁰⁵ We agree with Mr. Boos on all counts.

587. In contrast, Dr. Landsman construed both the statement at the March 10 meeting and in the March 12 telephone call to have indicated substantial completion of the instrumentation work.¹⁶⁰⁶ Dr. Landsman, under cross examination on that portion of his sworn statement in the investigation report which refers to the criterion set down at the March 10 meeting for work allowed to be non-Q as work "begun" before March 10, indicated that he used the word "begun" in that context to mean "essentially complete."¹⁶⁰⁷ In view of Dr. Landsman's and Mr. Cook's demonstrated lack of recall of what was actually said at the March 10 meeting and Dr. Landsman's admission of semantic confusion between beginning and completing an activity, we can

1604 Boos, Tr. 20085-20088.

1605 Boos, Tr. 20128.

1606 Landsman, Tr. 17430-17431; see also R. Cook, Tr. 17789-17791.

1607 Landsman, Tr. 17803-17805; see also Landsman, Tr. 17795-17796.

only conclude that if Dr. Landsman and Mr. R. Cook were misled as a result of the meeting and telephone call, the misunderstanding arose from their own subjective misapprehension and misunderstanding of what was said rather than from the objective statements of others.

588. We find that Mr. Boos likely made a statement about instrumentation cable and conduit installation at the March 10 meeting. However, this statement was based on accurate information at the preceding Friday's weekly project meeting furnished to him by Mr. Black or by Mr. Simpson based on information from Mr. Black. In any event, the statement was not intended (or construed by the only NRC Staff member who remembered it) as a precise status report intended to secure NRC approval for performing instrument installation non-Q. We find further that Mr. Boos' use of the phrase "essentially well underway" in the March 12 telephone call may have not been completely descriptive but was based on accurate and up to date information furnished to him that same day. Thus we conclude that Mr. Boos did not make either a material false statement or even a misleading statement in either the meeting or the conference call.

589. We note, however, that there was considerable difficulty in communications between the Staff and Consumers Power despite extensive meetings and telephone calls. One of the principal misunderstandings was the belief by Consumers Power that instrumentation was part of Phase 1 work at the same time the Staff believed it was part of Phase 2. Darl Hood, the

Midland Project Manager, stated in his written statement to the Investigator that he did not become aware of Consumers Power's view until a March 30 meeting.¹⁶⁰⁸ Mr. Hood indicated there (and in his oral testimony) that this discovery indicated to him that communications were lacking and that the NRC shared some of the blame for this.¹⁶⁰⁹ We find, therefore, that there may have been considerable miscommunication by both Consumers Power and the NRC Staff, but there were no misleading statements, either intentional or unintentional. Accordingly, nothing arising out of this incident is material to our decision regarding quality assurance implementation or even the more limited issues of management attitude.

B. Alleged Board Order Violations

1. Overview

590. On August 11, 1982, representatives of the Applicant and the NRC Staff met to address allegations by Dr. Landsman that the Applicant had violated this Licensing Board's April 30, 1982 Order.¹⁶¹⁰ Dr. Landsman's position was that two excavation activities constituted violations of the Order: (1) the excavation beneath an electrical duct bank commonly referred to as the "Deep Q" duct bank, and (2) the relocation of a buried fire protection line. During the course of the

1608 Staff Exhibit No. 22, Exhibit XII at pp. 2-3.

1609 Id.; Hood, Tr. 17761, 17766.

1610 Hood and Landsman, Tr. 21644-21647. See paragraphs 347-353 supra for a discussion of the April 30 Order.

meeting, Applicant denied having violated the April 30 Order.¹⁶¹¹ Subsequently, Dr. Landsman prepared a memorandum dated August 24, 1982, formalizing the charge of violations.¹⁶¹²

591. Following the August 11 meeting, the matter was referred to the NRC Office of Investigations ("OI"). OI conducted its initial investigation between January 3 and March 30, 1983. In a June 2, 1983 memorandum to James Keppler, Benjamin Hayes, Director, Office of Investigations, presented an overview of OI's conclusions. The memorandum indicated that while a "clear difference of opinion" was established, OI was not able to develop sufficient objective evidence to support the contention of either party. Mr. Hayes also concluded that further investigative effort was unlikely to resolve this issue. The memorandum stated that the investigation was closed.¹⁶¹³

592. At the request of Region III, on July 11, 1983, OI reopened its investigation. OI's second investigation, which was completed on August 8, 1983 and which is reported in a supplemental investigation report, reached a markedly differ-

1611 Id.

1612 See Staff Exhibit No. 26, Attachment 2.

1613 See Staff Exhibit No. 29. Despite requests by Staff counsel and by the Board, OI declined to provide either Mr. Hayes or his deputy, Mr. Fortuna, as a witness in this proceeding. None of the Staff witnesses had knowledge of the circumstances under which Staff Exhibit No. 29 was prepared, and we admitted it for the limited purpose of showing that OI took a position regarding the investigation, but not for the truth of the matters stated therein. We made the same ruling with respect to the second to last paragraph of the cover letter to the second OI investigation report, Staff Exhibit No. 28 at p. 2; Tr. 21671-21672.

ent conclusion from that of the first investigation. The cover letter to the second investigation report, authored by Mr. Hayes, states that the weight of the evidence developed during the supplemental investigation supports the conclusion that Applicant violated the April 30 Order.¹⁶¹⁴

593. We held hearings concerning the above-mentioned allegations were held on various days between October 31 and November 9, 1983, and on December 3, 1983. The NRC Staff testimony was presented by Ross Landsman, Ronald Cook and Darl Hood, as well as by Charles Weil and Harold Walker, who among others conducted the investigation on behalf of OI. James Mooney and Robert Wheeler presented prefiled direct testimony on behalf of the Applicant. The Staff, Ms. Stamiris and this Board requested that John Schaub, Applicant's Assistant Project Manager for the Soils Project, appear for cross-examination, and he did so. John Donnell, a former employee of a contractor at the Midland site, testified at the December 3, 1983 hearing.

594. The evidentiary record on the subject of the alleged violations has been fully developed. Numerous exhibits have been admitted into evidence. Extensive cross-examination has been conducted. Although the Applicant and the NRC Staff are in some disagreement as to overall conclusions, many of the underlying facts are not in dispute.

2. The Deep Q duct bank

595. The first excavation allegedly in violation of our Order occurred at the location where the Deep Q duct bank

1614

See Staff Exhibits No. 27 and No. 28.

intersects the freezwall. The freezwall consists of a series of underground pipes through which refrigerant is pumped. The soil down to the impervious till layer is thereby frozen, stopping the flow of groundwater. Once the groundwater flow is stopped, the excavation for underpinnings under the Auxiliary Building can be made in relatively dry soil.¹⁶¹⁵

596. In a November, 1981 letter, the NRC Staff approved the installation of the freezwall.¹⁶¹⁶ This approval encompassed all steps short of activating the freezwall equipment.¹⁶¹⁷ As a basis for its approval, the Staff noted that none of the steps involved in installing the freezwall was irreversible.¹⁶¹⁸

597. In prefiled testimony admitted into evidence in December of 1981, the Staff, while confirming its approval of the freezwall installation, set out certain licensing conditions precedent to freezwall activation.¹⁶¹⁹ One such condition required documentation that the freezwall, when activated,

¹⁶¹⁵ Burke, Corley, Gould, Johnson and Sozen, prepared testimony regarding remedial measures for the auxiliary building at p. 17, following Tr. 5509.

¹⁶¹⁶ Staff Exhibit No. 5. In December of 1981, Darl Hood testified concerning the Staff's review of the freezwall. He was unaware whether NRR had reviewed the working drawings prior to approval of the freezwall. Hood, Tr. 5489-5491. Some drawings, specifications and other information had been received by the Staff. Hood, Tr. 5490. Hood could not state, however, whether the Staff believed that the information provided by the Applicant to that date constituted a commitment. Hood, Tr. 5490.

¹⁶¹⁷ Hood, Tr. 5489; Kane, Tr. 21699.

¹⁶¹⁸ Staff Exhibit No. 5 at p. 1; Hood, Tr. 21703-21704.

¹⁶¹⁹ Hood, Kane and Singh, prepared testimony concerning the remedial underpinning of the auxiliary building area, Table A.20 at p. 1, following Tr. 5839.

would not adversely affect Seismic Category I structures, conduits and piping.¹⁶²⁰

598. In its initial technical proposals regarding the four freezeway utility crossings, the Applicant suggested that no physical protection of the utilities was necessary.¹⁶²¹ After further discussions with the NRC Staff, the Applicant proposed a method of protection involving excavation of the soils surrounding the underground utilities and within the zone of influence of the freezeway. The resulting gap between the utility and adjacent soils would protect the utility from heaving of the frozen ground.

599. In a letter dated January 6, 1982, the Applicant documented its proposal.¹⁶²² Attached to the letter is a summary of the measures the Applicant suggested for the protection of underground utilities and structures.¹⁶²³ Also attached to the letter are sketches showing a plan and profile view of each of the crossings. In each instance, the profile

¹⁶²⁰ At four separate locations, the freezeway crosses safety-related underground utilities. At each of these locations, a method had to be devised to protect the utility from potential damage due to the heaving of frozen soil while maintaining the integrity of the freezeway. See generally, Mooney and Wheeler, prepared testimony concerning the alleged violations of the April 30 ASLB Order and the March 1982 cable-pulling incident at p. 7, following Tr. 19983; Hood and Kane, Tr. 21692.

¹⁶²¹ Kane, Tr. 21692.

¹⁶²² See Staff Exhibit No. 26, Attachment 14.

¹⁶²³ The utility crossing designated "Crossing 3" in the January 6 letter is the Deep Q electrical duct bank. The crossing designated "Crossing 1" is another electrical duct bank (hereinafter referred to as the "shallow duct bank"). The crossing designated "Crossing 2" is actually two separate crossings of service water piping.

sketches show an excavation down to and slightly below the utility. The sketches indicate a gap between the bottom of the utilities and the bottom of the excavation, but show neither dimensions nor detailed plans.¹⁶²⁴ Because of the absence of details and dimensions, Applicant's witnesses described the sketches attached to the January 6 letter as "conceptual drawings."¹⁶²⁵ The report attached to the January 6 letter, however does contain some specifics. For example, the report indicates that the Deep Q duct bank is 22 feet deep at crossing 3, with a 6-inch to one foot gap between the exposed duct bank and the top of the excavation.¹⁶²⁶

600. In correspondence dated February 12, 1982, the NRC Staff approved the activation of the freezeway, subject to the Applicant's proposals regarding protection of underground utilities presented in the January 6, 1982 letter and certain additional conditions beyond those set forth in December 1981. Work commenced at all four utility crossings prior to April 30, 1982.¹⁶²⁷ In the course of construction, the Applicant added certain features not shown in the January 6 sketches to the designs for protecting utilities where they crossed the freezeway. The final configuration of the utility crossings is

1624 Wheeler, Tr. 22341.

1625 See Wheeler, Tr. 22341; Mooney, Tr. 22351.

1626 Staff Exhibit No. 26, Attachment 14, enclosed report at p. 3.

1627 Wheeler, Tr. 21953-21964; Mooney, Tr. 22350-22351; Staff Exhibit No. 26, Attachment 4, Letter from R. Tedesco to J. Cook dated February 12, 1982 (last document).

accurately depicted, in all respects save one, in Consumers Power Exhibit No. 60.¹⁶²⁸

601. At crossings 1, 2 and 3 as shown on Consumers Power Exhibit No. 60, the Applicant modified the initial design by imposing a load on or "surcharging" the bottom of the excavations in order to compensate for the weight of the soil lost to the excavation. Partly to accommodate the surcharge load and partly to permit human access below the utility, Applicant excavated a trench approximately ten feet in depth below the bottom of the utility at crossing 1. The bottom four feet of this trench is backfilled with concrete, creating a base for the receipt of the surcharge load.¹⁶²⁹ A somewhat similar approach is employed at crossings 2 and 3.¹⁶³⁰

602. Dr. Landsman testified that, in effect, he had no objections to the modifications that had been made to the

¹⁶²⁸ Consumers Power Exhibit No. 60, at Figure 5, shows a concrete "plug" extending approximately 11 feet below the bottom of the Deep Q duct bank. This was never installed. In place of the concrete plug, there is currently an open excavation having the same dimensions as the plug. It is this excavation which allegedly violated our Order.

It should be noted that the crossing locations in Exhibit 60 are numbered differently from those of the January 6 letter. The shallow duct bank is represented as Crossing 1 in both the January 6 letter and Exhibit No. 60. Crossing 2 of the January 6 letter was divided into two crossings, designated Crossings 2 and 3 in Exhibit No. 60. Crossing 4 in Exhibit No. 60, the Deep Q duct bank, is the same as Crossing 3 in the January 6 letter. See Kane, Tr. 21706-21707. Hereinafter, the designations used in Exhibit No. 60 will be adhered to, unless otherwise specified.

¹⁶²⁹ Consumers Power Exhibit No. 60, Figure 2.

¹⁶³⁰ Landsman, Tr. 21573; Consumers Power Exhibit No. 60, Figures 3 and 4.

first three crossings. With respect to crossing 1, he had been made aware of a number of field conditions which made it necessary to extend the excavation deeper than that depicted in the January 6 letter. Because of the presence of other utilities, the excavation was being carried out in very close quarters. As a practical matter, the hole had to be made large enough to accommodate an individual digging the soil away from the duct bank. In addition, a large concrete mud mat had to be broken up, resulting in a larger hole.¹⁶³¹

603. Dr. Landsman also testified regarding crossings 2 and 3. He thought he had discussed the surcharging of these crossings with Mr. Kane, but could not recall exactly when. He noted that if the Applicant, on its own accord, desired to surcharge the pits, he had no objection. Dr. Landsman was primarily concerned that the 6-inch gap between the utility and adjacent soils in the zone of influence of the freezeway would be maintained.¹⁶³²

604. As a result of field conditions encountered during excavation, the Applicant also varied its plans for crossing 4. Initially, Consumers Power intended to insert the freeze elements in a manner which would have frozen the soils directly beneath the duct bank. However, this plan was abandoned when Consumers Power discovered that the duct bank was deeper than expected so as to preclude proper insertion of the freeze elements where needed. As an alternative plan, Applicant

1631 Landsman, Tr. 21753-21754.

1632 Id.

decided to excavate the soils from below the duct bank and install a plug which would serve in place of the freezwall of that location.¹⁶³³

605. On April 30, 1982, in the midst of Applicant's freezwall crossing excavation activities, we issued our "Memorandum and Order (Imposing Certain Interim Conditions Pending Issuance of a Partial Initial Decision)." Following the issuance of the Order, Applicant sought to establish the precise limits of the Staff's prior approval of soils-related activities. To that end, Applicant sent a letter to the Staff dated May 10, 1982, describing, inter alia, the freeze wall activities for which it believed prior approval had been obtained.¹⁶³⁴

The letter addressed three categories of work: (1) remedial soils work which had been previously approved by the NRC and was continuing, (2) work previously approved which was not then underway, and (3) work which had been initiated with NRC cognizance, but which was no longer proceeding because explicit written approval had not been obtained. "Freeze wall installation, underground utility protection, soil removal [,] cribbing and related work in support of the freeze wall installation, freeze wall monitoring and freeze wall activation" were included in the first category.¹⁶³⁵

¹⁶³³ Mooney and Wheeler, prepared testimony concerning the alleged violations of the April 30 ASLB Order and the March 1982 cable-pulling incident at pp. 7-8, following Tr. 19983.

¹⁶³⁴ Staff Exhibit No. 26, Attachment 3.

¹⁶³⁵ Staff Exhibit No. 26, Attachment 3 at p. 2.

606. On May 20, 1982, during a break in an ACRS site tour which was then in progress, the Applicant and the Staff convened an impromptu meeting. The meeting was attended by Messrs. Kane, Hood and Landsman of the Staff, and by a number of individuals from Consumers Power Company and Bechtel.¹⁶³⁶ Notice of this meeting had not been provided to the public in accordance with NRR's open meetings policy; hence, Mr. Hood requested that no notes be taken and no minutes of the meeting be prepared.¹⁶³⁷ One of the purposes of the meeting was to discuss the freezwall utility crossings, although a number of different technical subjects were addressed.¹⁶³⁸ During the course of the meeting, the Staff was advised of the final, as completed configuration of freezwall crossings 1, 2 and 3, as well as the new proposal for crossing 4.¹⁶³⁹

¹⁶³⁶ See Staff Exhibit No. 26, Attachment 8 at p. 1; see also Landsman, Tr. 21549.

¹⁶³⁷ Hood, Tr. 21725-21726.

¹⁶³⁸ See generally, Mooney, Tr. 22457-22459; see Staff Exhibit No. 26, Attachment 8.

¹⁶³⁹ Hood and Kane, Tr. 21729-21730; Kane, Tr. 21739-21740; Landsman, Tr. 21754-21755, 21757. Dr. Landsman in fact knew that the Deep Q duct bank was deeper than originally anticipated prior to the May 20 meeting. Landsman, Tr. 21722. Mr. Kane previously knew that crossings 1, 2 and 3 had been equipped with concrete base mats for the surcharge load. Kane, Tr. 21735. During the portion of the site tour preceding the meeting, Mr. Hood saw surcharges in place, and both he and Mr. Kane examined some of the crossings. Kane and Hood, Tr. 21724; Hood, Tr. 21732. During the meeting, Applicant showed the Staff drawings depicting the actual condition of crossings 1, 2 and 3, as well as the detailed proposal for crossing 4. Hood and Kane, Tr. 21721; Landsman and Kane, Tr. 21748-21749, 21879.

607. During the May 20 meeting, there was considerable discussion about the method proposed by Applicant to backfill the excavations at the utility crossing points. The Staff was concerned that the concrete base mats at crossings 1, 2, and 3, and the proposed concrete plug at crossing 4, would create a zone of incompressible material and, consequently, differential settlement. From a reading of the transcript as a whole, it is apparent that the type of backfill to be used in the excavations was the focus of discussions at the meeting relating to the utility crossing points.¹⁶⁴⁰ This is also apparent from the notes of John Fisher, Bechtel's Remedial Soils Manager, who prepared the only surviving contemporaneous record of the meeting.¹⁶⁴¹

608. In addition to the backfill discussions, however, Dr. Landsman advised Applicant during the meeting not to dig beneath the Deep Q duct bank without receiving NRC approval.¹⁶⁴² Dr. Landsman testified that he "looked someone in the eye," probably Mr. Mooney or Mr. Schaub, when he gave this directive.¹⁶⁴³

609. Dr. Landsman's admonition was recorded in the handwritten notes of John Fisher. Mr. Fisher's notes contain the following entry: "We will proceed w/exposing utility & not

1640 See Kane and Hood, Tr. 21845-21846; Kane, Tr. 21763.

1641 See Staff Exhibit No. 26, Attachment 8.

1642 See Staff Exhibit No. 26, Attachment 8; Landsman, Tr. 21653; Hood and Kane, Tr. 21761-21762; Kane, Tr. 21764.

1643 Landsman, Tr. 21653, 21764.

proceed with excavating the pit below deep Q until NRC approval."¹⁶⁴⁴ Mr. Fisher, however, filed away his notes and did not circulate them within the Applicant's organization until after Landsman's allegation surfaced.¹⁶⁴⁵

610. Another set of notes was prepared by Robert E. Sevo, an employee of MPQAD in the soils area. Sevo's notes contain two relevant entries. The first entry, which corroborates John Fisher's notes, states: "No further deepening of the deep duct bank until NRR Concurrence after [sic]". The second entry, however, contradicts the Fisher notes and the first Sevo entry: "Deep duct bank opened up to allow freeze to start - then finish excavation to till."¹⁶⁴⁶

611. Applicant's management was not aware of the existence of either Mr. Fisher's or Mr. Sevo's notes. And, because of Mr. Hood's directive, no official minutes of the meeting were kept.¹⁶⁴⁷ Thus, Applicant's management did not

¹⁶⁴⁴ See Consumers Power Exhibit No. 65; Staff Exhibit No. 26, Attachment 8. Mr. Fisher, in a statement given to NRC Investigator Weil, said "the statement in my notes concerning excavation below the deep Q duct bank is written in ink in my notes, in contrast to most of the rest of my notes which were written in pencil. Most likely, this indicates the entry was made after the meeting" Staff Exhibit No. 27, Attachment 7 at p. 2.

¹⁶⁴⁵ Staff Exhibit No. 27, Attachment 7 at p. 2.

¹⁶⁴⁶ Staff Exhibit No. 27, Attachment 17 at pp 1-2. Mr. Sevo acknowledged the notes as his, but had no independent recollection of the May 20 meeting, could not recall discussing the entry with anyone, and did not look at the notes or show them to anyone until Investigator Weil asked to see his files. Staff Exhibit No. 27, Attachment 16 at p. 2.

¹⁶⁴⁷ Kane, Tr. 21725-21726.

have access to any written memoranda reflecting Dr. Landsman's statement.¹⁶⁴⁸

612. Although Mr. Mooney does not dispute that Dr. Landsman's warning was given, neither does he recall hearing it, and he left the May 20 meeting with the impression that the NRC had no objections to Applicant's plans for excavating under the Deep Q duct bank.¹⁶⁴⁹ Mr. Schaub, who also attended the meeting, testified that, in a separate discussion, Mr. Kane had approved both the excavation under the Deep Q duct bank and the proposed backfilling technique, provided such activities were carried out at Applicant's commercial risk.¹⁶⁵⁰ Mr. Hood recalled this discussion between Schaub and Kane, but testified that the opposite conclusion had been reached, namely, that Kane would not approve the above activities at Applicant's commercial risk.¹⁶⁵¹ Mr. Kane himself could not recall any discussions with regard to "commercial risk."¹⁶⁵²

613. At the May 20 meeting, the NRC Staff did not admonish the Applicant about or charge the Applicant with violating our Order by modifying crossings 1, 2, and 3, which

¹⁶⁴⁸ In an inspection report dated September 22, 1982, IE documented aspects of the meeting. This report was issued after the excavation under the Deep Q duct bank had taken place.

¹⁶⁴⁹ Mooney and Wheeler, prepared testimony concerning the alleged violations of the April 30 ASLB Order and the March 1982 cable-pulling incident at pp. 4-5, following Tr. 19983.

¹⁶⁵⁰ Schaub, Tr. 22504, 22505-22506.

¹⁶⁵¹ Hood, Tr. 21559.

¹⁶⁵² Kane, Tr. 21852.

modifications had been completed between April 30 and May 20.¹⁶⁵³
The Staff also did not ask the Applicant to reverse the steps
taken at these crossings, even though reversal was clearly
possible.¹⁶⁵⁴

614. On May 21, the Region III Inspectors onsite
conducted an exit meeting. This exit meeting was attended by a
number of individuals from the Applicant, Bechtel and the
NRC.¹⁶⁵⁵ Dr. Landsman has stated that he repeated his warning
not to dig under the Deep Q duct bank at this meeting.¹⁶⁵⁶ Dr.
Landsman also announced at this meeting that he had discovered
no items of noncompliance during his inspection on the preced-
ing day.¹⁶⁵⁷

615. Minutes of the exit meeting were prepared on June
4 for Donald Horn's signature by Applicant's Brian Palmer, an em-
ployee of Mr. Horn. Mr. Horn read the minutes before their
issuance, but does not recall discussing the portion relating
to the Deep Q duct bank with Mr. Palmer.¹⁶⁵⁸ The minutes
contain the following reference to the Deep Q duct bank:
"Landsman confirmed his understanding that the excavation would

1653 Kane, Tr. 21739.
1654 Kane, Tr. 21867.
1655 Staff Exhibit No. 26, Attachment 9 at p. 4.
1656 Staff Exhibit No. 26, Attachment 2 at p. 2.
1657 Staff Exhibit No. 26, Attachment 9 at p. 3.
1658 Staff Exhibit No. 27, Attachment 8 at p. 1.

be terminated a short distance below the duct bank rather than lower as originally planned."¹⁶⁵⁹

616. According to John Fisher, the above-quoted statement was in error since it did not reflect the Applicant's actual plans as of May 21.¹⁶⁶⁰ Mr. Schaub testified that the reference reflected the need to stop the excavation below the duct bank long enough for Dr. Landsman to observe the utility protection pits prior to activation of the freezwall, rather than a prohibition against digging beneath the utility. Dr. Landsman had given this instruction at the meeting the day before.¹⁶⁶¹ Mr. Palmer confirmed Mr. Schaub's understanding of the reference in a statement given to NRC Investigator Weil, although Mr. Palmer admitted that his memory on the subject was dim.¹⁶⁶² Glen Murray, an employee of Applicant's onsite construction organization, provided yet a third interpretation. In a written statement taken by Investigator Weil, Mr. Murray explained that his understanding was that Dr. Landsman's comment was intended to apply to an earlier proposal to make a full width excavation from the bottom of the duct bank down to the top of

¹⁶⁵⁹ James Mooney, in testimony and in a statement made to Investigator Weil, confirmed that he was on the distribution list for the minutes and that he probably read them shortly after their issuance. However, he does not recall noticing the referenced prohibition against excavation under the Deep Q duct bank, and was not made aware of the prohibition until Landsman raised the issue in August. See Staff Exhibit No. 27, Attachment 11; Mooney, Tr. 22415; see also Weil, Tr. 22226.

¹⁶⁶⁰ Staff Exhibit No. 27, Attachment 7 at p. 2.

¹⁶⁶¹ Schaub, Tr. 22534-22535; see also Staff Exhibit No. 26, Attachment 8 at p. 1.

¹⁶⁶² Staff Exhibit No. 27, Attachment 9.

the clay till. Mr. Murray did not believe Dr. Landsman's admonition was intended to apply to the partial width shaft cut-off trench that was finally decided upon and excavated.¹⁶⁶³

617. In a letter dated May 25, 1982, which was partially in response to the Applicant's May 10 letter, the Staff announced the approach it would take in reviewing the balance of the soils remedial activities at the Midland Plant. Enclosure 4 to the letter specifically addressed some of the items in the Applicant's May 10 letter, including the freezwall and utility protection. The letter indicated that, in the future, the Staff would discontinue its practice of approving individual construction steps and instead complete its review as an integrated package. Importantly, those activities for which Staff review was substantially completed as of April 1, 1982, were approved.¹⁶⁶⁴

618. The salient features of the May 25 letter are as follows: (1) it confirms prior approval of the "soil removal" and "underground utility protection" activities listed in paragraph I(c) of Applicant's May 10 letter; (2) it withholds confirmation of "related activities in support of the freezwall", also listed in paragraph I(c) of the May 10 letter; (3)

¹⁶⁶³ Staff Exhibit No. 27, Attachment 30.

¹⁶⁶⁴ See Staff Exhibit No. 26, Attachment 4. According to Mr. Hood, the May 25 letter took into account facts revealed at the May 20 meeting. Hood, Tr. 21799, 21810-21811. However, the letter was, for the most part, drafted by Mr. Hood prior to May 20, with input from Mr. Kane. Kane, Tr. 21793, 21657. Dr. Landsman reviewed a draft of the letter. Landsman, Tr. 21789. The letter was in substance regarded by Mr. Hood as a response to the Applicant's May 10 letter. Hood, Tr. 21360.

it indicates that the Staff relied on, inter alia, November 16 and November 24, 1981, and January 6, 1982 letters from Applicant to Harold Denton, and November 19, 1981 ASLB Hearing testimony of J. P. Gould, as the basis for Staff review and approval of the above items;¹⁶⁶⁵ (4) it lists open items (e.g., that a report analyzing whether backfill would lead to differential settlement at the utility crossings was required), but contains no language specifically mentioning the Deep Q duct bank or the excavation under it; and (5) it provides that "[a]ny deviation must be reported and approved by the [S]taff."¹⁶⁶⁶

¹⁶⁶⁵ The November 16 and 24, 1981 letters have neither been introduced nor admitted into evidence. The January 6, 1982 letter is Attachment 14 to Staff Exhibit No. 26.

¹⁶⁶⁶ The meaning of this phrase, which may be found in the final paragraph of Enclosure 4 to the May 24 letter, is somewhat confusing. The entire paragraph provides:

"In summary, ambiguity associated with CPC's use of the term 'Phase 1 work' and 'related [freeze wall] work' preclude confirmation of specific prior approval of these activities. Similarly, failure by CPCo to identify the particular existing construction dewatering wells preclude us from determining whether previous Staff concurrence had been indicated. No description or discussion is provided for a 'FIVP proof load test' and no record of prior Staff approval can be located. Consequently, continuation of these activities in conformance with the foregoing staff comments will be in accordance with the Board Memorandum and Order of April 30, 1982. Any deviations must be reported and approved by the staff."

This language is separated from the discussion of concurrence of freezwall activities in paragraph I(c) by a number of different items. Moreover, paragraph I(c) provides that explicit concurrence for freezwall installation, underground utility protection, soil removal and cribbing (but not "related work in support of the freezwall installation") had been obtained from the Staff prior to our April 30 Order.

619. The NRC Staff and the Applicant have different interpretations of the May 25 letter, stemming in part from different interpretations of the above-described events which preceded the issuance of the letter. Mr. Mooney testified that the letter confirmed his understanding that the installation and activation of the freezwall, of which the utility protection proposals were a part, had been approved prior to April 30, 1982. In accordance with this understanding, the modifications in the freezwall crossings, made in part after April 30, were merely field variations upon an already approved conceptual design and within the intended scope of the original approval. In his opinion, the excavation under the Deep Q duct bank was one such field modification, within the activity "utility protection."¹⁶⁶⁷

620. Mr. Hood expressed a different view of the letter, which he had drafted. While admitting that the letter took into account the facts disclosed by Applicant at the May 20 meeting, he testified that the basis upon which the Enclosure 4, paragraph I(c) items had been approved was limited to the references recited in Enclosure 4, particularly the January 6, 1982 letter of the Applicant. In Mr. Hood's opinion, since the January 6 letter omits mention of an excavation beneath the Deep Q duct bank, no such excavation was approved by Enclosure 4 to the May 25 letter.¹⁶⁶⁸

1667 Mooney, Tr. 22360-22362.

1668 Hood, Tr. 21360-21362.

621. Mr. Hood stated that he intended the May 25 letter to warn the Applicant to refrain from excavating under the Deep Q duct bank by including the reference to "related items in support of the freezewayall." Because of the informal character of the May 20 meeting, Mr. Hood avoided making a direct reference to the prohibition in his letter, but chose instead to use the same words that the Applicant had used in its May 10 letter.¹⁶⁶⁹ Mr. Hood also cited the "any deviations" language of Enclosure 4 as a warning to the Applicant.¹⁶⁷⁰ Mr. Hood further testified that the reference to the utility crossings in Enclosure 4 was to the Deep Q duct bank, not to the other three crossings.¹⁶⁷¹

622. In the Board's opinion, since the Staff's reservations about "related activites" in its May 25 letter dealt with activities which the Applicant had placed in the category of previously approved and ongoing work in its May 10 letter, the Applicant had a duty to clear up the confusion upon receipt of the May 25 letter. Mr. Mooney testified that he went to Mr. Hood shortly after receipt of the May 25 letter to ask why the Staff refused confirmation of "related activities." Mr. Mooney has stated that he explained to Mr. Hood what had been intended by "related activities", but has agreed that the Deep Q duct bank was not discussed.¹⁶⁷²

1669 See Hood, Tr. 21360-21361, 21802-21804.

1670 See Hood, Tr. 21805.

1671 Hood, Tr. 21834.

1672 Mooney, Tr. 21972-21973.

623. Following the issuance of the May 25 letter, there continued to be a misunderstanding between Applicant and the Staff with regard to the approval status of the Deep Q duct bank excavation. For example, in late July, the NRC conducted a design audit in Ann Arbor. Applicant prepared the agenda for this audit, and included as one item all of the freezeway crossings.¹⁶⁷³ The Applicant indicated on the agenda that the status of the freezeway crossings was "confirmatory," acknowledging that Applicant still owed the Staff documentation regarding the concrete backfill of the crossings.¹⁶⁷⁴

624. Applicant's agenda formed the working draft used by the NRC during the meeting. This agenda listed the "SSER Status" of the "Design Modification Freezeway Crossing with Duct Banks" as a "Confirmatory Item."¹⁶⁷⁵ And, the Staff's intended purpose for the audit was to obtain a list of every open soils-related item.¹⁶⁷⁶ The Staff subtracted from or otherwise changed the draft agenda as it saw fit during the audit, and items drawn from other lists prepared by the Staff prior to the audit were added as necessary.¹⁶⁷⁷ Mr. Hood, however, testified that with respect to the agenda item relating to the freezeway crossings, no changes had been made

1673 Hood, Tr. 21814-21815.
1674 Hood, Tr. 21815-21816; Staff Exhibit No. 26, Attachment 16.
1675 Hood, Tr. 21815.
1676 Hood, Tr. 21826.
1677 Hood, Tr. 21854-21855.

during the audit and no changes were subsequently made from the initial draft up to the time when minutes of the audit were published by Mr. Hood on November 12, 1982.¹⁶⁷⁸ In the meeting summary subsequently prepared by Mr. Hood, the freezeway crossings item was described as "confirmatory."¹⁶⁷⁹

625. During the time frame of the confusion surrounding the Deep Q duct bank excavation, because of problems encountered in excavations and drilling during the first quarter of 1982, the Applicant developed an excavation permit system. This system requires, among other things, that a representative from Applicant's organization sign excavation permits, signifying that all necessary NRC approvals have been obtained.¹⁶⁸⁰ Mr. Robert Wheeler, Applicant's Remedial Soils Section Head, was the official responsible for signing-off on behalf of Consumers Power Company Construction.¹⁶⁸¹

626. Between April 30 and June 11, 1982, Mr. Wheeler sought and obtained Dr. Landsman's specific approval for every excavation request or permit at the Midland site, so as to make

1678 Hood, Tr. 21853-21857; Staff Exhibit 26, Attachment 10.

1679 Hood, Tr. 21818.

The Midland SER (NUREG-0793), at p. 1-15, defines a "Confirmatory Issue" as an item "for which the staff has reasonable assurance that the appropriate regulatory requirements will be met by the applicant (and therefore the health and safety of the public), but for which certain confirmatory information has not yet been provided by the applicant." See also Hood, Tr. 21817-21819.

1680 A discussion of the excavation permit system may be found at paragraphs 365 to 367, supra.

1681 See Staff Exhibit No. 26, Attachment 10.

certain that whatever NRC approvals were required were, in fact, given.¹⁶⁸² Within this time period, Dr. Landsman specifically reviewed and approved such excavations as a 72-inch diameter pond fill repair, a hole for a freezeway element extending 54 feet below grade, a slope layback plan, and an additional Auxiliary Building deep-seated benchmark. Landsman also approved excavations for fence post holes.¹⁶⁸³ Dr. Landsman could not recall documenting his approval of the additional Auxiliary Building deep-seated benchmark or the expansion of the freeze hole to 54 feet below grade. He had not documented the approval of any fence post hole excavations.¹⁶⁸⁴

627. On June 11, 1982, Mr. Wheeler and Dr. Landsman discussed the excavation permit system. Dr. Landsman indicated that the system was acceptable, although he had previously

1682 Landsman, Tr. 21919-21921.

1683 See Staff Exhibit No. 26, Attachment 10. Dr. Landsman explained that the freeze hole approval related to an extension or deepening of an already existing hole, and that it could be regarded as a minor design change. He further explained that the hole was a part of the freezeway which had already been approved by the NRC. Landsman, Tr. 21917-21918. Dr. Landsman testified that the deep-seated benchmark excavation which he had approved was identical to the other deep-seated benchmarks previously approved by NRR, and hence was "no problem." Landsman, Tr. 21922-21923. Dr. Landsman also testified that the 72-inch pond fill repair had been brought to him for approval, and that he had approved excavation permits for fence post holes. Tr. 21921, 21927-21928. Dr. Landsman could not state whether any of these excavations, except for the 72-inch pond fill repair, were outside quality-related soils at the Midland jobsite. With regard to the 72-inch pond fill repair, he suggested that NRR was treating it as within its jurisdiction, as it became one of the major items discussed at the May 20 meeting. Landsman, Tr. 21921-21922.

1684 Landsman, Tr. 21925-21928.

objected to certain portions of it.¹⁶⁸⁵ Dr. Landsman also indicated that he no longer wished to review all excavation permits before work started; he told Mr. Wheeler that he would review the paperwork on all excavations having complete excavation permits between his site visits, and that the excavation permit procedure should be followed.¹⁶⁸⁶ Dr. Landsman also stated that he would review excavation permits for major excavations, such as the excavation for the service water underpinning, before work started.¹⁶⁸⁷

628. Mr. Wheeler documented his June 11 discussions with Dr. Landsman in a handwritten note made contemporaneously with the discussion. The note reads: "Excavation permit procedure is OK - He will review signed off permits from site visit to site visit. He is only concerned with major excavations such as SWS underpinning."¹⁶⁸⁸

629. Dr. Landsman had some difficulty recalling the substance of his June 11 discussion with Mr. Wheeler.¹⁶⁸⁹ Eventually, Dr. Landsman conceded that he had, in fact, told Mr. Wheeler he did not want to review in advance excavation permits except for major excavations such as the service water pump structure underpinning.¹⁶⁹⁰ However, Dr. Landsman added a

1685 Landsman, Tr. 21907; Wheeler, Tr. 22005-22006.
1686 Staff Exhibit No. 26, Attachment 10 at pp. 1-2.
1687 Landsman, Tr. 21934.
1688 Staff Exhibit No. 26, Attachment 10 at p. 4.
1689 Landsman, Tr. 21557, 21561-21562; Landsman and Weil, Tr. 21901-21911.
1690 Landsman, Tr. 21934.

qualification: He understood the agreement to apply only to work previously approved by NRR. Dr. Landsman admitted, however, that he had not mentioned this caveat to Mr. Wheeler when discussing the matter.¹⁶⁹¹ Thus, as the record now stands, Mr. Wheeler and Dr. Landsman are in accord as to the terms of their agreement as openly expressed by the parties on June 11, 1982.

630. Mr. Wheeler's perception as to whether the agreement applied only to previously approved work differed from Dr. Landsman's. Mr. Wheeler concluded that Dr. Landsman had given approval to go ahead with routine, non-drilled excavations under the excavation permit system, subject to Staff review after the fact. He had anticipated that the Staff would eventually find that sufficient controls were in place to justify a broad work release for routine excavations at the jobsite, and correctly believed that a broad work release was within the Staff's powers under our April 30 Order.¹⁶⁹²

631. On two occasions after reaching the agreement with Dr. Landsman, Mr. Wheeler asked Dr. Landsman to review permits after-the-fact, in order to carry out our instructions to clarify activities for which the Applicant sought specific approval under our Order.¹⁶⁹³ Based on his practice at the time of making fortnightly visits to the jobsite, Dr. Landsman testified that the excavation permits provided by Mr. Wheeler

1691 Landsman, Tr. 21557-21558, 21911, 21935, 21938.

1692 Staff Exhibit No. 26, Attachment 10 at p. 1.

1693 Wheeler, Tr. 22103-22105. See also Mooney, Tr. 22103.

for the review were not more than two weeks old.¹⁶⁹⁴ On both occasions, Dr. Landsman declined to review the proffered excavation permits.¹⁶⁹⁵

632. Mr. Wheeler understood the phrase "major excavation", as used by Dr. Landsman, in terms of the potential for hitting an underground obstruction, rather than in terms of the number of man-hours involved in the excavation activity. A drilled excavation involves a greater likelihood of hitting an object than does an open excavation which provides greater visibility.¹⁶⁹⁶

633. Mr. Wheeler was questioned extensively concerning the application of his agreement with Dr. Landsman in particular cases. A chart prepared by Mr. Wheeler in anticipation of the August 11, 1982 enforcement meeting was used in this questioning. This chart displayed the first nine work permits issued at the Midland site, their dates, their signa-tors, and the source of confirmation of NRC approval.¹⁶⁹⁷ A listing of 1982 NRC discussion items covering the time frame late May to early July, 1982, prepared by Wheeler, was also used in the questioning.¹⁶⁹⁸

1694 Landsman, Tr. 22212.

1695 Wheeler, Tr. 22407-22408.

1696 See Wheeler, Tr. 22404-22405.

1697 Stamiris Exhibit No. 123; Wheeler, Tr. 21987.

1698 Stamiris Exhibit No. 131; Wheeler, Tr. 22462. Wheeler was questioned regarding the "NRC Approval Discussion Items" items listed beside 6/23/82. He recalled having a discussion with Dr. Landsman about the item "anode installations", but had

634. Shortly after the agreement with Dr. Landsman was reached, Mr. Wheeler advised members of his staff, particularly Glenn Murray and Donald Sibbald, of the agreement.¹⁶⁹⁹ Mr. Wheeler also showed the individuals who worked for him the note he made of his agreement with Dr. Landsman.¹⁷⁰⁰ Mr. Wheeler did not recall having discussions with his staff relating to either the Deep Q duct bank work permit or excavation permit before they were issued, although that would have been the usual practice.¹⁷⁰¹ Donald Sibbald, Applicant's Technical Section Engineer who signed the work permit on July 22, indicated that he may have spoken with John Schaub about NRC approvals for the permit, but he was not certain.¹⁷⁰² Mr. Wheeler's work permit chart, referred to supra, indicates that Mr. Schaub confirmed NRC approval of the work permit, but Mr. Wheeler has testified that this chart was prepared shortly before the August 15 enforcement meeting, and that it represented Mr.

(Footnote 1698 continued from page 418)

forgotten whether he asked for approval. Wheeler, Tr. 22462-22464. This operation involved drilling. Wheeler, Tr. 22464. With respect to the item entitled "BWST Crack Repair," he believed he asked Landsman for approval. Wheeler, Tr. 22467. This item involved more than just excavation. Wheeler, Tr. 22479-22480. He also asked Landsman for approval of the "wells for 72 line" item and the "five additional dewatering wells" item. Wheeler, Tr. 22467-22468.

1699 Staff Exhibit No. 26, Attachment 10;

1700 Wheeler, Tr. 22484.

1701 See Wheeler, Tr. 21993-21994.

1702 Staff Exhibit No. 26, Attachment 13.

Sibbald's uncertain recollection at the time.¹⁷⁰³ Mr. Wheeler had no specific knowledge that Mr. Sibbald had contacted anyone before signing the work permit, and Mr. Schaub himself does not recall being approached by Mr. Sibbald about the permit.¹⁷⁰⁴

635. Based on the agreement between Mr. Wheeler and Dr. Landsman, Mr. Murray signed the excavation permit for the Deep Q duct bank on July 21. Mr. Murray believes that he probably contacted Mr. Wheeler before signing, but could not recall with certainty.¹⁷⁰⁵ On the basis of the signed permits, the excavation began on July 23, 1982.¹⁷⁰⁶

636. On July 28, Dr. Landsman first became aware that the Deep Q duct bank excavation was continuing. When he became aware of the excavation, he told someone at the site that he

1703 Wheeler, Tr. 21990.

1704 Wheeler, Tr. 21991; Schaub, Tr. 22492-22493.

1705 Staff Exhibit No. 26, Attachment 12 at p. 2.

1706 Consumers Power Exhibit No. 63 at p. 1.

During the time period involving the excavation below the Deep Q duct bank and the fire protection line relocation (discussed infra), Applicant published weekly schedules of proposed work, sending copies to both Dr. Landsman and Mr. Hood. See Staff Exhibit No. 27, Attachment 20. These schedules had asterisks placed next to various work items to indicate "NRC review required." The asterisks appeared sporadically in conjunction with references to the Deep Q duct bank excavation and fire protection line relocation. The significance of these schedules and asterisks has been the subject of much speculation in this proceeding. For example, Mr. Schaub had no clear recollection as to why the asterisks appeared or disappeared. Schaub, Tr. 22527-22531. Nor was there a clear understanding of what "NRC review required" meant in this context. Schaub, Tr. 22527-22530. The one thing that is clear is that neither the Applicant nor the Staff used these schedules for tracking NRC approvals for work items. Landsman and Hood, Tr. 22265; see Staff Exhibit No. 27, Attachments 23, 27 and 30.

had prohibited it, but he does not recall who this person was.¹⁷⁰⁷

637. Mr. Wheeler testified that his staff first became aware of Dr. Landsman's concern on July 29. The excavation was then promptly halted, except for certain clean-up activities and steps necessary to secure the excavation.¹⁷⁰⁸

638. We have heard testimony as to whether the Deep Q excavation was "major" or "minor." The quantity of soil removed, approximately 16 cubic yards,¹⁷⁰⁹ is slight in comparison to the "major" excavations contemplated at the Midland site. For example, the service water pump structure underpinning excavation referred to by Dr. Landsman, as reported in Mr. Wheeler's June 11 note, involved over 800 cubic yards.¹⁷¹⁰

639. Mr. Kane testified that, based on quantity of soil, the Deep Q excavation was minor, but that it was major from a safety standpoint.¹⁷¹¹ Mr. Kane expressed technical concerns regarding the proposal to use concrete backfill in the trench under the duct bank but, apart from objecting to dividing the job into two separate tasks, he expressed no concerns with the excavation itself.¹⁷¹² For example, he saw no major

1707 Landsman, Tr. 22266.
1708 Wheeler, Tr. 22091-22092, 22097.
1709 Wheeler, Tr. 22406.
1710 Wheeler, Tr. 22406.
1711 Kane, Tr. 21565.
1712 Kane, Tr. 21846-21847, Kane, Tr. 21863.

problem with the hole being open for a year; thus, the 12 foot by 3-3/4 foot pit under the duct bank has remained untouched since July 30, 1982.¹⁷¹³ Dr. Landsman has no technical problem with the excavation as it exists today, although he has characterized the excavation as major.¹⁷¹⁴ We conclude that the excavation is clearly reversible, and that its having been dug or its remaining unfilled has little safety significance.

640. On December 3, 1983, we heard testimony from John L. Donnell, a former employee of a contractor on the Midland site who held the position of remedial soils QA supervisor. Dr. Landsman and Mr. R. Cook assert that Mr. Donnell told them that the Applicant knew it did not have prior approval to excavate below the Deep Q duct bank, and that Mr. Donnell lost his job by arguing with Applicant's management about the approval status of the excavation before the work commenced.¹⁷¹⁵ Mr. Donnell, however, does not recall making those statements to either Dr. Landsman or Mr. R. Cook, although he does remember meeting with Landsman and Mr. R. Cook shortly after being discharged.¹⁷¹⁶ Mr. Donnell suggested that there may have been some confusion between the Deep Q duct bank incident and a drilling incident involving the same duct

1713 Kane, Tr. 21847.

1714 Landsman, Tr. 21773.

1715 Staff Exhibit No. 27, Attachments 1 and 2; Landsman, Tr. 21357-21359; Cook, Tr. 21374-21375.

1716 Donnell, deposition testimony at pp. 33-36, following Tr. 22573.

bank.¹⁷¹⁷ He denied, however, that he lost his job for any reason other than the NRC's desire to have a geotechnical engineer hired in his place.¹⁷¹⁸

641. Although Mr. Donnell believes that our Order required all soils work to be approved before commencement,¹⁷¹⁹ he does not recall the specifics of the approval status of the excavation beneath the Deep Q duct bank.¹⁷²⁰ Mr. Donnell acknowledged that he signed the excavation permit for the Deep Q duct bank excavation on behalf of MPQAD prior to commencement of the work, and is certain that he would not have signed that permit if he had any doubts about NRC approval at the time.¹⁷²¹ In signing the excavation permit, Mr. Donnell relied upon Glen Murray's signature, which was already on the document, as an indication that NRC approval had been obtained.¹⁷²² Mr. Donnell had confidence in the way that Mr. Murray and Mr. Wheeler (Murray's supervisor) performed their jobs, and believed that they were conscientious in following our April 30 Order.¹⁷²³

¹⁷¹⁷ Donnell, deposition testimony at pp. 83-85, following Tr. 22573.

¹⁷¹⁸ Staff Exhibit No. 31, pp. 90-91; Donnell, Tr. 22605-22606.

¹⁷¹⁹ See Staff Exhibit No. 31, pp. 98, 102; Donnell, Tr. 22616-22617.

¹⁷²⁰ Donnell, deposition testimony at pp. 37-39, following Tr. 22573.

¹⁷²¹ Donnell, deposition testimony at pp. 27-28, following Tr. 22573.

¹⁷²² Id. at pp. 28-29; see also Donnell, Tr. 22577-22580, 22618-22619.

¹⁷²³ Staff Exhibit No. 31 at pp. 87-88.

642. Although the record is replete with seemingly contradictory statements concerning Mr. Donnell's actions and involvement with the excavation beneath the Deep Q duct bank, we are not persuaded that Mr. Donnell was aware that NRC approval was lacking. Nor are we persuaded that Mr. Donnell believed that the Applicant was aware that a problem with NRC approval existed prior to commencement of the excavation beneath the Deep Q duct bank.

3. Conclusions regarding
Deep Q Duct Bank

643. Before finding whether a violation of our Order took place based on the above facts, we first must decide the applicable standard for our decision.

644. Our April 30, 1982 Order requires that certain activities not be undertaken without NRC "approval" -- a term having both subjective and objective implications. One standard that could be derived from the Order would be to make approval dependent upon the Staff's subjective intentions: In other words, that an activity was approved only if the Staff intended to approve it. By this criterion, however, the mere allegation of a violation results in a violation, since the Staff would not likely misrepresent its subjective intentions.

645. The above approach, however, is at odds with principles of fair play and equity; in effect, it makes the Applicant strictly responsible for determining actual NRC intentions, however expressed. Although we expect the Applicant to observe high standards of conduct, we reject a legal

test based solely on the subjective intentions of the Staff in favor of a more balanced, objective approach. In our opinion, if the Applicant had a reasonably valid basis for believing that an activity was approved, then it has not violated our April 30 Order. Under this standard, the Staff's subjective intentions are relevant, but not controlling.

646. In applying the adopted standard to the facts before us, we give considerable weight to the oral directives of Dr. Landsman. Applicant clearly did not give appropriate attention to Dr. Landsman's warnings at the May 20 and May 21 meetings. Although the May 20 meeting was, by Mr. Hood's orders, not formally documented, it nevertheless falls on the Applicant to fully understand and carry out Staff requirements -- even those expressed orally. The Sevo and Fisher notes referenced supra demonstrate that they at one time knew of Dr. Landsman's directive. Unfortunately, neither was in the chain of command for confirming NRC approvals, and both stated that Dr. Landsman's directive did not come to mind when the work commenced. Still, the references in their notes indicate that Dr. Landsman had spoken in an understandable way on May 20. The Applicant clearly bears some responsibility for failing to absorb Dr. Landsman's statements.

647. Given the fact that Dr. Landsman's directive was missed by responsible Consumers Power management personnel, we can understand how Mr. Mooney concluded that the Deep Q excavation was a part of the freezeway, and was thus approved prior to April 30. Mr. Mooney's misunderstanding of this issue

had its genesis before the May 20 meeting and continued thereafter, partly because Dr. Landsman's warnings were not caught and partly because of somewhat mixed signals being sent by the Staff.

648. The treatment by the Staff of the other three crossing modifications, the fact that the May 25 letter approved soil removal (when the only soil removal left was under the Deep Q), the fact that the same letter approved "utility protection" without direct restriction and addressed the need for a backfill report without ever mentioning excavation under the duct bank, and the fact that Staff did not change the designation "confirmatory" in the soils audit draft all contributed to the misunderstanding. Also, the procedural aspects of the communications -- the lack of documentation regarding the May 20 meeting, the tardiness of IE's inspection report and the absence of NRC documentation of the Wheeler/Landsman agreement¹⁷²⁴ -- helped cause the problem as well. Because the Staff was engaged in an abnormally detailed and comprehensive review, of which the duct bank was only a small part,¹⁷²⁵ it was all the more important to maintain communications safeguards. Since the adoption on August 12, 1982, of a written work authorization procedure by Applicant and Region III, no further problems with alleged Order violations have arisen.

649. Notwithstanding the foregoing, we conclude that the events culminating in the May 25 letter created an obligation

1724 Landsman, Tr. 21932-21935.

1725 See Staff Exhibit No. 26, Attachment 4.

on Applicant's part to inquire about uncertainties concerning Staff approval of freezeway-related activities. The Applicant must have known that ambiguities existed upon receipt of the May 25 letter, which letter withheld confirmation of approval on one of the items the Applicant was continuing work on (i.e., "related activities" in support of the freezeway). This reservation incorporated information discussed at the May 20 meeting, and was intended by the Staff as a warning directly relating to the Deep Q duct bank. It presented Applicant with an opportunity to put an end to any confusion stemming from the May 20 and May 21 discussions concerning utility protection plans.

650. The Applicant, in fact, did inquire about the Staff's reservations about "related activities." Unfortunately, during the resulting discussion between Mr. Mooney and Mr. Hood, Mr. Hood failed to connect the restriction in the May 25 letter to the Deep Q duct bank. Mr. Mooney's attempt to clear up this ambiguity is significant, not only because it indicates Mr. Mooney's attitude at the time, but also because, after the inquiry, Applicant had a reasonable basis for believing that the May 25 letter approved the "utility protection" activities without a restriction regarding the deep Q duct bank. Thus, it is understandable that Mr. Mooney took no action to prevent the work from starting.

651. On June 11, Mr. Wheeler entered into a verbal agreement with Dr. Landsman. To Mr. Wheeler's credit, he had started out by taking all excavation permits to Dr. Landsman

for specific approval. This was probably required by our April 30 Order, which covers literally every excavation in Q-soils at the jobsite. When Landsman decided not to review all permits, a task which was most likely burdensome, Mr. Wheeler thought he had obtained Landsman's permission to proceed with minor excavations, subject to Landsman's review after work started. Mr. Wheeler documented this agreement in a handwritten note made at the time.

652. Mr. Wheeler and Dr. Landsman did not communicate clearly, partly because of the lack of clarity regarding the relationship between NRR and Region III in the approval process. Dr. Landsman allowed Mr. Wheeler broad discretion and has respect for his technical judgment.¹⁷²⁶ At the time of their oral agreement, Dr. Landsman believed that NRR was approving work for purposes of compliance with our Order.¹⁷²⁷ Mr. Wheeler, on the other hand, concluded that, once Dr. Landsman had contemporaneously endorsed the generic excavation permit system, this indicated that Region III had authority to enter into (and did enter into) what in effect was the approval of an integrated package.¹⁷²⁸

653. We cannot conclude that Dr. Landsman's un verbalized qualification -- that the agreement applied only to previously approved work -- can be viewed objectively as part of

1726 Landsman, Tr. 21914.

1727 Landsman, Tr. 21557-21558, 21911, 21934; see also paragraph 629 supra.

1728 Staff Exhibit No. 26, Attachment 10; see also paragraph 630 supra.

the agreement. Although Mr. Wheeler and Dr. Landsman share blame for not communicating more precisely on this point, in a sense the problem related to the interface between IE and NRR. Our Order explicitly asks the Staff to give attention to the coordination of approvals. In addition, Dr. Landsman's failure to mention the qualification or document the understanding, as was his responsibility under our May 5 Memorandum and Order, prevented detection of any confusion. In light of these considerations, we conclude that the Wheeler/Landsman agreement, like the May 25 letter, provides in part a reasonably valid basis for Applicant's belief that the excavation under the deep Q Duct bank has been approved.

654. Even under the terms of the Wheeler/Landsman agreement, the duct bank excavation could only be deemed approved if it were a "minor" excavation. On this issue there is a conflict in testimony between Applicant and the Staff. We conclude that there was a reasonable basis for the Applicant's believing the excavation was minor. On June 11, Mr. Wheeler and Dr. Landsman discussed major work in terms of the service water pump structure underpinning. By any criteria -- amount of soil removed, safety significance or number of man-hours involved -- the Deep Q excavation was minor by comparison. If the excavation had major consequence, it could have been easily filled in, but this hasn't been the case. Mr. Kane testified that the excavation had major safety significance, but the basis for his conclusion was that it was the first step leading to the placement of a concrete plug. In sum, no plausible

safety importance of the excavation alone has been set forth in the record.

655. Although the question is close, we find from a preponderance of the evidence that the Applicant did have a reasonably valid basis for believing that the excavation under the Deep Q duct bank was approved. In drawing this conclusion, we do not excuse the Applicant for failing to absorb Dr. Landsman's warnings. We observe, however, that a number of miscommunications between Applicant and Staff came into play which prevented detection of the misunderstanding. Thus, we find that the excavation under the Deep Q duct bank did not violate our April 30 Order.

656. By reaching this conclusion, we do not blame the Staff for the communication problems that arose. We only point out factors tending to ameliorate an unduly harsh finding against Applicant. For example, apart from its apparent difficulty in executing communications, Applicant's behavior generally indicates a high degree of respect for our April 30 Order. The Applicant placed Mr. Wheeler in charge of obtaining approvals, and Mr. Wheeler originally brought literally everything to Dr. Landsman for specific review. Furthermore, it is evident that Mr. Wheeler was, above all, concerned with trying to honor our Order. In addition, Applicant put into effect written procedures to control work approvals, and attempted on May 10 to obtain explicit clarification of previously approved items. We cannot now conclude that the mistakes and miscommunications which occurred during the first month of transition following

our April 30 Order taint all efforts that Applicant took to observe the Order.

665. We conclude that the basic cause of this controversy was poor communications, compounded by a lack of effective documentation in circumstances too complex to be handled on a purely oral basis. In short, we find no careless disregard for our Order on the part of Applicant.

4. Relocation of the Fire Line

658. The second excavation allegedly in violation of our Order involves the relocation of a buried fire protection line.¹⁷²⁹

659. In the summer of 1982, Applicant planned certain excavations to rebed and replace service water piping. As an ancillary task, Applicant desired to relocate a fire line to an area where it would not be damaged by these planned excavations. The old fire line, located near the circulating water intake structure, was to be abandoned, and a new line was to be installed at a nearby location. Neither the old line nor the new line was designated Category I.¹⁷³⁰

660. Applicant's decision to commence with the fire line relocation was made after Mr. Wheeler's June 11, 1982 discussion with Dr. Landsman, where Dr. Landsman told Mr. Wheeler that he only wished to review in advance the permits

¹⁷²⁹ See Staff Exhibit No. 26, Attachment 2

¹⁷³⁰ Mooney and Wheeler, prepared testimony concerning the alleged violations of the April 30 ASLB Order and the March 1982 cable-pulling incident at pp. 3, 9-10, following Tr. 19983.

for major excavations.¹⁷³¹ Mr. Sibbald, who signed the excavation permit for the fire line on July 26, does not specifically recall whether he discussed the permit with anyone before signing.¹⁷³² Mr. Murray, who signed the work permit for this excavation on July 27, believes that he contacted Mr. Schaub before signing the permit, and recalls that the two of them decided that the work was "minor" under the terms of the Wheeler/Landsman agreement. Mr. Schaub, however, does not recall such a discussion with Mr. Murray.¹⁷³³ Mr. Wheeler does not recall whether he had discussions with Messrs. Sibbald, Murray or Schaub about either of the permits before they were signed.¹⁷³⁴

661. The fire line relocation commenced on July 30 and ended on August 5.¹⁷³⁵ The excavation involved the digging of a 75 foot trench approximately 7 to 8 feet deep, and the removal of approximately 200 cubic yards of soil.¹⁷³⁶ The line itself is not Seismic Category 1, but the excavation passed in

1731 Mooney and Wheeler, prepared testimony concerning the alleged violations of the April 30 ASLB Order and the March 1982 cable-pulling incident at p. 3, following Tr. 19983. See paragraphs 627 to 632, supra, for a discussion of the Wheeler/Landsman agreement.

1732 Staff Exhibit 26, Attachment 13.

1733 Staff Exhibit 26, Attachment 12 at p. 2; Schaub, Tr. 22494-22495.

1734 Wheeler, Tr. 21993-21994.

1735 Wheeler, Tr. 22398.

1736 Landsman, Tr. 21553-21554; Wheeler, Tr. 22406.

close proximity to and exposed safety related utilities.¹⁷³⁷
The record reflects no problems that occurred as a result of
this excavation.

662. With respect to the issue of whether this was a
"major" or a "minor" excavation under the Wheeler/Landsman
agreement, we heard testimony concerning the number of man-hours
expended on the task. Mr. John Simpson, a Bechtel scheduler,
stated that the work took approximately 300 man-hours.¹⁷³⁸ Ron
Cook, an NRC Inspector, thought that the 300 hour figure might
be slightly understated, but did not offer his own estimate.¹⁷³⁹
Dr. Landsman testified that one backhoe could do the work in an
hour, and that the 300 hour estimate must include more work
than just the excavation.¹⁷⁴⁰

663. Based on the evidence in the record, we find
that the fire line excavation was "minor" under the terms of
the Wheeler/ Landsman agreement. The excavation had no safety
significance, was completed in relatively few man-hours, and
did not involve soil removal of the same magnitude as the SWPS
underpinning.¹⁷⁴¹ Accordingly, we find that this excavation
did not violate our April 30 Order.

1737 Mooney and Wheeler, prepared testimony concerning the
alleged violations of the April 30 ASLE Order and the March
1982 cable-pulling incident at p. 3, following Tr. 19983;
Landsman, Tr. 21556-21557.

1738 Staff Exhibit No. 27 at p. 34.

1739 R. Cook, Tr. 21556, 21944.

1740 Landsman, Tr. 21554, 21944.

1741 See Landsman, Tr. 21933-21934.

664. In his August 24, 1982 memorandum, Dr. Landsman indicates that he discovered the fire line excavation on August 4.¹⁷⁴² He has testified that he believes he informed Applicant or Bechtel of the violation on that same day, but that he does not recall who he spoke with.¹⁷⁴³

665. The fire line excavation work was completed on August 5. No stop work order was issued until August 9, however, because Mr. Wheeler's group was not apprised of Dr. Landsman's objections until the later date.¹⁷⁷⁴ A June 2, 1983 inspection report confirms that the Applicant formally stopped work on the 9th after being advised of a potential Order violation.¹⁷⁴⁵

666. Dr. Landsman has testified that the excavation for the fire line was a deliberate violation of our April 30 Order, because the excavation took place after Applicant had been advised of Dr. Landsman's complaint regarding the Deep Q duct bank.¹⁷⁴⁶ Mr. Wheeler, however, explained that, as he understood it, Dr. Landsman's concern regarding the Deep Q excavation was that it took place contrary to Dr. Landsman's specific directive not to proceed with that work.¹⁷⁴⁷ Mr.

1742 Staff Exhibit No. 26, Attachment 2 at p. 2.

1743 Tr. 22220.

1744 Wheeler, Tr. 22109, 22398.

1745 See Staff Exhibit 26, Attachment 17. This document was prepared by Mr. Shafer. Dr. Landsman apparently never discussed with Mr. Shafer whether Landsman's statement in his August 4, 1982 memorandum should be included in Shafer's inspection report. Tr. 22292-22294.

1746 Landsman, Tr. 21643.

1747 Wheeler, Tr. 21982-21983.

Wheeler testified that no question had been raised concerning Applicant's interpretation of the June 11 Wheeler/Landsman Agreement.¹⁷⁴⁸ Once Mr. Wheeler was informed of Dr. Landsman's concern with the fire line excavation, the work was promptly stopped.¹⁷⁴⁹

5. Conclusions Regarding Fire Line

667. With respect to the allegations concerning the relocation of the fire line, we employ the same objective approach we used in considering the Deep Q duct bank excavation. Thus, if Applicant had a reasonably valid basis for believing that an activity was approved, it has not violated our April 30 Order.

668. In applying the adopted standard to the facts before us, we find that the Applicant had a reasonably valid basis for concluding that the fire line excavation was allowable. Applicant acted reasonably in believing that this excavation was "minor" under the terms of the Wheeler/ Landsman Agreement. Moreover, all Staff objections to the Deep Q excavation appeared to be based on the fact that the Staff had previously articulated a specific directive not to proceed with that work: no questions were raised concerning Applicant's interpretation of the Wheeler/ Landsman agreement. We therefore conclude that the excavation for the fire line relocation did not violate our April 30 Order. We further find that there was a reasonable basis to Mr. Wheeler's belief that Dr. Landsman's concerns were limited to the Deep Q duct bank and that Consumers Power did not deliberately ignore Dr. Landsman's directives by excavating for the fire line relocation.

1748 Wheeler, Tr. 21982-21983.

1749 Wheeler, Tr. 22397-22398.

VII. CONCLUSION

669. We have previously made known our concerns about the status of quality assurance implementation by Consumers Power in our Order of April 30, 1982. That Order was prompted by soils-related problems, both actual and potential. The effect of the April 30 Order is to require explicit Staff approval prior to undertaking any of the activities specified in the original December 6, 1979 Modification Order. The Construction Permits for the Midland Plant have been amended to reflect the April 30 Order. While it is apparent that, immediately subsequent to the entry of our Order, misunderstandings regarding the scope of Staff approvals arose, it now seems to us that the routine of securing NRC Staff approval before work activities are begun is well understood and functioning properly.

670. The April 30, 1982 Order was expressly made subject to further modification or revocation, if appropriate. We believe that the April 30, 1982 Order should be continued in effect. However, we see no need for augmentation of the Order. Its provisions, when taken together with the comprehensive CCP and the management changes mentioned above does provide an acceptable basis for concluding that there is reasonable assurance that the soils remedial activities can be completed in accordance with regulatory requirements. The third party reviews called for in the CCP and in the remedial soils area and the level of the NRC Staff involvement in day to day con-

struction activities are among the most stringent yet implemented for nuclear power plants and provide adequate means for measuring Consumers Power's performance in both the soils area and balance of plant. We especially agree with those witnesses of the NRC Staff who asserted that it was Consumers Power's performance under the CCP which would be determinative of the effectiveness of that program and its indication of improved management attitude. In addition, we take note of Mr. Keppler's testimony that Consumers Power's recent performance at the Palisades nuclear plant demonstrates that Consumers Power Company can take on serious problems and correct them.¹⁷⁵⁰ The measures adopted at Midland appear to us to be significant steps toward improving the quality of work at that site. Moreover, under NRC regulations and under our April 30, Order, the Staff has the tools to control and evaluate construction activities at Midland and has been diligent in exercising those controls. Accordingly, we see no reason for modifying the April 30 Order and leave it in place.

¹⁷⁵⁰ Keppler, Tr. 15154, 15415-15416.

CONCLUSIONS OF LAW

The Licensing Board has reviewed the evidence submitted by the parties in this proceeding and the proposed findings of fact and conclusions of law prepared by the parties. Based on the preponderance of the reliable, probative and substantial evidence of record, the Board makes the following conclusions of law:

671. As we concluded in our April 30, 1982 Order at page 7, the soils-related quality assurance deficiencies set forth in Part II and in Appendix A of the "Order Modifying Construction Permits" (dated December 6, 1979) were an adequate basis for the issuance of the Modification Order.

672. An unintentional, but materially false, statement was made in the FSAR in that the FSAR falsely stated that "all fill and backfill were placed according to Table 2.5-9." This material false statement, described in Appendix B of the December 6, 1979 "Order Modifying Construction Permits," was an adequate basis for issuance of that Order.¹⁷⁵¹

673. The December 6, 1979 "Order Modifying Construction Permits" should be sustained only insofar as it conforms with the Board's April 30, 1982 "Memorandum and Order (Imposing

¹⁷⁵¹ See Joint Exhibit No. 6. The Board did not take direct evidence on this matter because Consumers Power Company, in a joint stipulation with the NRC Staff, agreed not to contest that the material false statement was made and that it constituted an adequate basis for issuance of the December 6, 1979 Order. We note further that Applicant and Staff agree that this false statement was unintentional. Joint Exhibit No. 6. No evidence was presented to contradict this conclusion, and we therefore also find that the false statement was unintentional.

Certain Interim Conditions Pending Issuance of Partial Initial Decision)". In light of events subsequent to the December 6 Order, the suspension of activities which that Order would require prior to amendment of the application seeking approval for soils remedial activities for safety-related structures and systems and prior to amendment of Construction Permits No. CPPR-81 and No. CCPR-83 is no longer justified. The Board finds that continuation of its April 30, 1982 Order will be fully effective to accomplish the purposes of the December 6, 1979 Order. The Board further notes that continuation of its April 30, 1982 Order is preferable because the experience which has been gained in the implementation of that Order since it was first issued demonstrates that implementation of that Order is now effective and efficient. The Board also concludes that the flexibility afforded the Staff in determining the manner in which our April 30, 1982 Order is implemented is necessary to meet the changing conditions of a nuclear project.

674. Consumers Power Company's quality assurance program complies with the quality assurance requirements set forth in 10 CFR Part 50, Appendix B.

675. Consumers Power Company's management understands and accepts its responsibilities to ensure proper implementation of quality assurance during the remainder of construction activities on the Midland Project and has taken effective measures to carry out this responsibility.

676. Consumers Power Company's management is committed to ensuring that the remedial measures it has chosen for the

purpose of resolving the soils settlement problems and the balance of plant quality assurance implementation problems are being, and will continue to be, properly implemented.

677. With continuation of our April 30, 1982 Order and with the commitments made by Consumers Power Company to third-party reviews and the Construction Completion Program, the Board has reasonable assurance that proper implementation of quality assurance requirements will continue throughout the remedial work associated with soils settlement and throughout the balance of the construction process on the Midland Project.

ORDER

678. In accordance with the Atomic Energy Act, as amended, and 10 CFR §§2.760, 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,
2. that the Board's April 30, 1982 "Memorandum and Order (Imposing Certain Interim Conditions Pending Issuance of Partial Initial Decision)" is continued in effect.

It is further ORDERED that this Partial Initial Decision shall be immediately effective as of the date of issuance and shall constitute the final action of the Commission forty-five (45) days after issuance thereof, subject to any review pursuant to the above-cited Rules of Practice.

679. Within ten (10) days after service of this Partial Initial Decision, any party may take an appeal to the Com-

mission by the filing of a notice of appeal. A brief in support of the appeal should be filed within thirty (30) days thereafter [forty (40) days in the case of the Staff]. Within thirty (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 appeal.

THE ATOMIC SAFETY AND
LICENSING BOARD

Charles Bechhoefer, Chairman
Administrative Judge

Frederick P. Cowan
Administrative Judge

Jerry Harbour
Administrative Judge

APPENDIX A

SPECIFIC QUALITY ASSURANCE AND
CONSTRUCTION CONCERNS AND THEIR RESOLUTIONS

680. As we noted in the main body of our Findings, we have heard testimony on a number of specific incidents or concerns which have arisen over the past two years. In one instance we have specifically called for testimony on certain items. In other cases the Staff raised the specific issues in testimony. We set forth our specific findings on these matters for completeness, but, with one minor exception noted below, we have found no common thread running through these incidents which would be helpful to us in analyzing the soils quality assurance implementation or management attitude of Consumers Power management.

A. Soils-Related Incidents

1. Introduction

681. Since February, 1982, when the record on QA/QC was first closed, a number of drilling and excavation incidents have occurred at the site.¹⁷⁵² We describe below specific incidents discussed in testimony and the resolution of each of these.

2. Testimony on drilling and other soils incidents called for by the Board

682. When we reopened the record on QA/QC and management attitude, we requested that the parties present testimony

¹⁷⁵² Mooney, prepared testimony on remedial soils work at p. 3, following Tr. 17017.

on five specific nonconformance reports. These nonconformances all related to excavations in the soils area. These nonconformances, in hindsight, indicated the need for the Excavation Permit Procedure which Consumers Power adopted in May, 1982. Otherwise, however, they show no common mode of failure or common cause.

a. Consumers Power Nonconformance Report No. M01-4-2-008, Rev. 1.

683. Sometime prior to February 2, 1982, a 42-inch diameter by 40-foot deep hole was drilled within the "Q"-fill area at approximate grid location E 539, S 5135.¹⁷⁵³ This hole was drilled for a 36-inch diameter closed-bottom casing, which was set in the hole to accommodate construction equipment that was to be supported by an overhead crane.¹⁷⁵⁴ The difference between the diameter of the hole and the diameter of the casing left a 3-inch gap between the casing and the surrounding fill. This gap was not grouted or packed with any other material;¹⁷⁵⁵ thus, the unsupported surrounding fill was able to loosen and collapse.¹⁷⁵⁶

1753 See R. Cook, Landsman, Gardner and Shafer, October 29, 1982 prepared testimony with respect to quality assurance, Attachment 7A, following Tr. 11391.

1754 Bird, Tr. 11433-11434, 11843.

1755 Bird, Tr. 11431-11432.

1756 See R. Cook, Landsman, Gardner and Shafer, October 29, 1982 prepared testimony with respect to quality assurance, Attachment 7A, following Tr. 11391. After the site dewatering recharge test was initiated, the casing floated up, rising approximately 4 feet, and water and fallen material accumulated at the bottom of the hole. See Bird, Tr. 11431-11433.

634. At the time the hole was drilled, Bechtel's construction practice was to place such excavations within the control of Field Engineering.¹⁷⁵⁷ Field Engineering administered an excavation permit system, and a permit under this system was in fact issued for the drilling of the hole.¹⁷⁵⁸ The Field Engineering system involved a check to insure that no underground utilities would be disturbed. Moreover, the Bechtel specification then applicable to this drilling, C-211, required that backfilling of excavations meet certain requirements, including the involvement of the on-site Geotechnical Engineer. However, the Field Engineering permit system was not a formal part of the site QA program; at the time of the incident, there were no formal quality controls applicable to excavation. And, the actual drilling of the hole was not required to be done under the supervision of the on-site Geotechnical Engineer.¹⁷⁵⁹

685. On February 2, 1982, Applicant issued NCR number MO1-4-2-008 and placed a hold tag on the 42-inch diameter hole.¹⁷⁶⁰ The NCR was prepared because MPQAD desired to have specific controls established and documented to cover excava-

¹⁷⁵⁷ Bird and Wheeler, prepared testimony concerning five specified NCRs at p. 2, following Tr. 11408.

¹⁷⁵⁸ Id.; Bird, Tr. 11413, 11429. See also Bird and Wheeler, Tr. 11603-11604.

¹⁷⁵⁹ Bird and Wheeler, prepared testimony concerning five specified NCRs at pp. 2-3, following Tr. 11408; Tr. 11429-11430.

¹⁷⁶⁰ See R. Cook, Landsman, Gardner and Shafer, October 29, 1982 prepared testimony with respect to quality assurance, Attachment 7A, following Tr. 11391.

tion -- including drilling -- in "Q"-fill areas, because such activities (even though not themselves "safety related") could affect the quality of "Q"-fill and could potentially impact "Q"-listed utilities.¹⁷⁶¹ Partially as a result of this NCR, Consumers Power adopted a new Excavation Permit Procedure, FIC 5.100.¹⁷⁶² This procedure is discussed supra at paragraphs 365 to 367.

b. Consumers Power Nonconformance
Report No. M01-9-2-038

686. On or about February 26, 1982, two 4-inch diameter by 48-foot deep holes were drilled at approximate grid locations S 4959, E 527 and S 4971, E 562, respectively.¹⁷⁶³ The hole at approximate grid location S 4959, E 527 was in "Q"-fill.¹⁷⁶⁴

¹⁷⁶¹ Bird and Wheeler, prepared testimony concerning five specified NCRs at pp. 3-4, following Tr. 11408; see Bird, Tr. 11428-11429. Ms. Stamiris has suggested that the lack of drilling supervision by the on-site Geotechnical Engineer was a major failing with the prior system and thus, inferentially, a principal motivating force for the adoption of the new excavation permit procedure (FIC 5.100, appended as Attachment 1 to the prepared testimony of Bird and Wheeler following Tr. 11408). Tr. 11427-11428. However, Walter R. Bird expressed the opinion that this was not the case. Mr. Bird indicated that sound practices were used in the actual drilling, and that a Geotechnical Engineer would have most likely have found it appropriate to allow the drillers to proceed as they did. Bird, Tr. 11428.

¹⁷⁶² See Bird and Wheeler, prepared testimony concerning five specified NCRs at pp. 3, 8, and Attachment 1, following Tr. 11408.

¹⁷⁶³ See R. Cook, Landsman, Gardner and Shafer, October 28, 1982 prepared testimony with respect to quality assurance, Attachment 7B, following Tr. 11391.

¹⁷⁶⁴ Id. See also Bird and Wheeler, prepared testimony concerning five specified NCRs at p. 3, following Tr. 11408.

Both holes were test borings to obtain information on soil conditions in the vicinity of the freeze wall.¹⁷⁶⁵

687. Under the Bechtel Field Engineering administered excavation permit system discussed at paragraphs 365 to 368, supra, Bechtel Quality Control monitored the drilling of these two test borings.¹⁷⁶⁶ After the drilling of the hole in "Q"-fill, the hole was backfilled by pouring grout into the hole from the surface.¹⁷⁶⁷ The on-site Geotechnical Engineer was present during the pouring.¹⁷⁶⁸ While the methods used for drilling and soil stabilization of the test borings were not specifically covered by instructions, procedures or drawings, they were in accordance with construction practice that was accepted at that time.¹⁷⁶⁹

688. On March 8, 1982, Consumers Power issued NCR number MOI-9-2-038.¹⁷⁷⁰ This NCR was prepared because MPQAD desired to have specific controls established and documented to cover excavation and drilling in "Q"-fill areas, because such

1765 Bird and Wheeler, prepared testimony concerning five specified NCRs at p. 3, following Tr. 11408.

1766 See R. Cook, Landsman, Gardner and Shafer, October 29, 1982 prepared testimony with respect to quality assurance, Attachment 7B at p. 1, following Tr. 11391.

1767 Id. at p. 3.

1768 See Bird and Wheeler, prepared testimony concerning five specified NCRs at p. 3, following Tr. 11408; Bird, Tr. 11425.

1769 Bird and Wheeler, prepared testimony concerning five specified NCRs at p. 3, following Tr. 11408.

1770 See R. Cook, Landsman, Gardner and Shafer, October 29, 1982 prepared testimony with respect to quality assurance, Attachment 7B, following Tr. 11391.

activities (even though not themselves "safety related") could affect the quality of "Q"-fill and could potentially impact "Q"-listed utilities.¹⁷⁷¹ Partially as a result of this NCR, Consumers Power adopted the new Excavation Permit Procedure, FIC 5.100, which is discussed supra at paragraphs 365 to 367.¹⁷⁷²

c. Consumers Power Nonconformance
Report No. MOI-9-2-051

689. On April 14, 1982, Applicant was performing certain remedial work on the Unit No. 2 Borated Water Storage Tank.¹⁷⁷³ This work involved the installation of a new concrete ring beam foundation surrounding the old foundation, and required the removal of an existing electrical duct bank.¹⁷⁷⁴ During the excavation of the duct bank, concrete providing lateral support to the fill underneath the southwest corner of the BWST valve pit was inadvertently removed, allowing the fill to slide into the void created by the removal of the duct bank.¹⁷⁷⁵

¹⁷⁷¹ See Bird and Wheeler, prepared testimony concerning five specified NCRs at p. 3, following Tr. 11408; see Bird, Tr. 11428-11429.

¹⁷⁷² See Bird and Wheeler, prepared testimony concerning five specified NCRs at pp. 3, 8, and Attachment 1, following Tr. 11408.

¹⁷⁷³ See R. Cook, Landsman, Gardner and Shafer, October 29, 1982 prepared testimony with respect to quality assurance, Attachment 7C, following Tr. 11391; Bird, Tr. 11420.

¹⁷⁷⁴ Bird and Wheeler, prepared testimony concerning five specified NCRs at p. 6, following Tr. 11408; Landsman, Tr. 11929.

¹⁷⁷⁵ Bird, Tr. 11421; Landsman, Tr. 11876, 11929-11930.

690. Immediate action was taken to correct the resulting void under the valve pit foundation. Loose, disturbed material was removed from the undermined area. Forms were placed as required around the excavation, and concrete was poured. During the pouring, concrete vibrators were used to prevent the formation of pockets or voids. The work was monitored by the on-site Geotechnical and Field Engineers, inspected by Bechtel Quality Control, and observed by MPQAD.¹⁷⁷⁶

691. On April 21, 1982, Applicant issued NCR number MOI-9-2-051.¹⁷⁷⁷ This NCR indicated the need to revise the Bechtel Engineering administered excavation permit system to provide for stricter controls so as to protect structures or utilities encountered within the proximity of the excavation. This concern has been addressed by Applicant in FIC 5.100, the new Excavation Permit Procedure,¹⁷⁷⁸ is discussed supra at paragraphs 365 to 367.

d. Bechtel Nonconformance Report
No. 4199

692. On April 24, 1982, an obstruction was encountered while drilling an ejector well for the freeze wall monitoring pit. Bechtel Field Engineering believed that the obstruction

¹⁷⁷⁶ See R. Cook, Landsman, Gardner and Shafer, October 29, 1982 prepared testimony with respect to quality assurance, Attachment 7C, following Tr. 11391.

¹⁷⁷⁷ Id.

¹⁷⁷⁸ See Bird and Wheeler, prepared testimony concerning five specified NCRs at p. 6 and Attachment 1, following Tr. 11408.

was the concrete overpour around a deep "Q" electrical duct bank, and drilling continued until the drilling fluid or "mud" was lost. Subsequently, on or about April 28, drilling mud was observed coming out of conduits in the Auxiliary Building.¹⁷⁷⁹

693. It was determined that the obstruction was actually the "Q" duct bank, and that the drilling had penetrated both the duct bank and some of the conduits inside. This penetration allowed the drilling mud to escape from the hole and flow to the lowest point of the duct bank -- the Auxiliary Building.¹⁷⁸⁰ A subsequent investigation revealed that the duct bank was penetrated because the drilling rig had been mispositioned by several feet.¹⁷⁸¹

694. On April 28, Consumers Power's Site Manager issued a written stop work directive applicable to all drilling operations and sheet-piling activities by Mergentime Corporation and its subcontractors.¹⁷⁸² The next day, Bechtel initiated NCR number 4199.¹⁷⁸³ On May 19, Applicant issued FSW-22,

1779 Bird and Wheeler, prepared testimony concerning five specified NCRs at p. 4, following Tr. 11408; Bird, Tr. 11437-11438.

1780 Bird and Wheeler, prepared testimony concerning five specified NCRs at p. 4, following Tr. 11408; Bird, Tr. 11613-11615.

1781 Bird and Wheeler, prepared testimony concerning five specified NCRs at p. 4, following Tr. 11408; Bird, Tr. 11598-11599.

1782 Bird and Wheeler, prepared testimony concerning five specified NCRs at p. 4, following Tr. 11408; Bird, Tr. 11509-11512, 11536-11539. See also Stamiris Exhibit No. 39.

1783 See R. Cook, Landsman, Gardner and Shafer, October 29, 1982 prepared testimony with respect to quality assurance, Attachment 7E, following Tr. 11391. Applicant became aware of the nonconformance in the same time frame as Bechtel, and, as Bechtel had already initiated an NCR, determined that it was not necessary to duplicate the effort. Bird, Tr. 11507-11508.

a formal stop work order.¹⁷⁸⁴ Such a document was not prepared earlier because the work had already been stopped by the Site Manager; nevertheless FSW-22 was initiated in order to provide for tracking and close-out of the corrective action required to rescind the stop work.¹⁷⁸⁵ The stop work was lifted on May 26 after the implementation of the new Excavation Permit Procedure, FIC 5.100, discussed supra at paragraphs 365 to 367.¹⁷⁸⁶

e. Bechtel Nonconformance Report
No. 4245

695. On May 18, 1982, an obstruction was encountered during the drilling of Observation Well No. 4 ("Obs. No. 4"), and drilling was stopped.¹⁷⁸⁷ On May 19, the on-site Geotechnical Engineer reviewed the drawings in his possession, and, on failing to locate any known utility, allowed the drilling of Obs. No. 4 to resume. After several hours of drilling, soil subsidence was noted in the area adjacent to the drilling.¹⁷⁸⁸ It was determined that this subsidence was due to the presence

1784 Stamiris Exhibit No. 40.

1785 Bird and Wheeler, prepared testimony concerning five specified NCRs at p. 4-5, following Tr. 11408; Bird, Tr. 11450, 11519-11526.

1786 Bird and Wheeler, prepared testimony concerning five specified NCRs at p. 5, following Tr. 11408; Bird, Tr. 11446, 11504L.

1787 Wheeler, Tr. 11750. Obs. No. 4 is part of the permanent dewatering system and will be used to monitor groundwater levels in the area where it is located. Wheeler, Tr. 11693. See also Consumers Power Exhibit No. 31.

1788 Wheeler, Tr. 11750-11751

of a 24 to 36-inch diameter, 9-foot deep underground void near the casing to the well.¹⁷⁸⁹

696. After the void was discovered, on May 19, Consumers Power's Site Management, MPQAD and Bechtel QC concurred that the work on Obs. No. 4 should be stopped and that Bechtel should issue an activity hold.¹⁷⁹⁰ Because the activity hold had been issued, no formal stop work order was prepared. Contemporaneously, Bechtel initiated NCR number 4245 relating to the incident.¹⁷⁹¹

697. After an investigation, it was determined that the obstruction referred to in paragraph 703, supra, was a non-"Q" 12-inch diameter condensate drain line.¹⁷⁹² The drillers and the on-site Geotechnical Engineer were unaware of the possibility of hitting this line because the drawing showing the presence of the line was not on the list of drawings to be reviewed prior to and during drilling.¹⁷⁹³ The line was actually penetrated by the casing of the well as the casing was

¹⁷⁸⁹ Bird and Wheeler, prepared testimony regarding 5 specified NCRs at p. 5, following Tr. 11408; R. Cook, Landsman, Gardner and Shafer, October 29, 1982 prepared testimony with respect to quality assurance, Attachment 7D, following Tr. 11391; Bird, Tr. 11502-11504B.

¹⁷⁹⁰ See Stamiris Exhibit No. 43.

¹⁷⁹¹ Wheeler, Tr. 11633; Bird, Tr. 11493; R. Cook, Landsman, Gardner and Shafer, October 29, 1982 prepared testimony with respect to quality assurance, Attachment 7D, following Tr. 11391; Tr. 11502-11504B.

¹⁷⁹² Bird and Wheeler, prepared testimony regarding 5 specified NCRs at p. 5, following Tr. 11408; Wheeler Tr. 11814.

¹⁷⁹³ Bird and Wheeler, prepared testimony regarding 5 specified NCRs at p. 5, following Tr. 11408.

being advanced into the ground, rather than by the drill bit of the cable drill tool.¹⁷⁹⁴

698. It is believed that the impact and associated vibration of the well casing striking the condensate drain line may have contributed to the formation of the void.¹⁷⁹⁵ The remainder of the void is thought to have been caused by the "bailing" or water and drilled material removal action of the drilling rig that was used and the manner in which the rig was advanced into the ground. As the drill and casing were advanced into sand below the water table, a suction was created by the bailing action of the rig. It is believed that this suction pulled backfill material from outside the casing down to the bottom of the hole and up through the casing.¹⁷⁹⁶

699. Consumers Power has revised the specification for well drilling to restrict the position of the bailer in relation to the bottom of the well casing. This should limit excess soil removal in any future application of the drilling technique used for Obs. No. 4.¹⁷⁹⁷ In addition, the new Excavation Permit Procedure, FIC 5.100, discussed supra, require inclusion in the permit submittal a listing of drawings, by

1794 Wheeler, Tr. 11815-11816.

1795 Bird and Wheeler, prepared testimony regarding 5 specified NCRs at p. 5, following Tr. 11408.

1796 Hendron, Tr. 8647-8648; Bird, Tr. 11620; Bird and Wheeler, prepared testimony regarding 5 specified NCRs at p. 5, following Tr. 11408.

1797 Bird and Wheeler, prepared testimony regarding 5 specified NCRs at p. 5, following Tr. 11408.

discipline, which represent the most complete information available on all underground utilities at the site, and which must be reviewed prior to excavation or drilling.¹⁷⁹⁸

3. Other soils-related incidents and disputes

a. Slope layback mismatch

700. Drawings specifying the trench excavation for the auxiliary building access shafts near the turbine building called for a slope layback of 1 vertical to 1.5 horizontal. However, during a tour of the site, an NRC inspector observed that the layback was being concreted at a slope nearly 1 vertical to 1 horizontal.¹⁷⁹⁹ This work was being supervised by a Bechtel Field Engineer.¹⁸⁰⁰ Consumers Power attributed the slope discrepancy to the difficulty in determining a reference point for the horizontal dimension.¹⁸⁰¹

701. After the discrepancy was discovered, Project Engineering prepared a Field Change Notice ("FCN") to reflect the as-built condition of the slope layback. However, as the

¹⁷⁹⁸ Bird and Wheeler, prepared testimony regarding 5 specified NCRs at p. 5 and Attachment 1, following Tr. 11408. See also paragraphs 365-367 supra.

¹⁷⁹⁹ Bird, prepared testimony on quality assurance at pp. 1-2, following 16975; R. Cook, Landsman, Gardner and Shafer, prepared testimony with respect to quality assurance, Attachment 5 at pp. 4-5, following Tr. 11391.

¹⁸⁰⁰ Bird, prepared testimony on quality assurance at p. 2, following 16975; R. Cook, Landsman, Gardner and Shafer, prepared testimony with respect to quality assurance, Attachment 5 at p. 5, following Tr. 11391.

¹⁸⁰¹ Bird, prepared testimony on quality assurance at p. 2, following 16975.

slope layback had already been completed, an NCR should have been issued rather than the FCN. MPQAD later issued NCR M01-4-2-109.¹⁸⁰²

702. Project Engineering has since reviewed the as-built condition of the slope layback and determined that a reworking of the slope is not required. A design change has been processed to change the slope requirement to 1 vertical to 1 to 1.5 horizontal. The slope conforms to the requirement.¹⁸⁰³

703. On November 2, 1982, training sessions were conducted to augment prior training received by the Field Engineers. The Field Soils Organization conducted training for a portion of its Field Engineers in the proper use of FCNs and the need to prepare NCRs. The Resident Geotechnical Engineer conducted training for all on-site Geotechnical Soils Engineers and Resident Geotechnical Engineers in the responsibilities of the on-site Geotechnical Engineer as they relate to the new site Excavation Permit System.¹⁸⁰⁴

b. Loose sands beneath the service water piping

704. In July, 1980, based on a review of Applicant's logs of borings drilled in 1979, the NRC Staff became aware that loose sands existed beneath the service water piping

¹⁸⁰² Bird, prepared testimony on quality assurance at p. 2, following 16975. See also R. Cook, Landsman, Gardner and Shafer, prepared testimony with respect to quality assurance, Attachment 5 at p. 5, following Tr. 11391.

¹⁸⁰³ Bird, prepared testimony on quality assurance at p. 2, following Tr. 16975.

¹⁸⁰⁴ Id. at pp. 2-3.

located to the north of the Service Water Pump Structure (SWPS) and the Circulating Water Intake Structure (CWIS).¹⁸⁰⁵ The Staff was concerned that these loose sands could impact the service water piping because, under maximum design earthquake loading, such sands have the potential to liquify.¹⁸⁰⁶ However, it was the Staff's belief, based on Applicant's response to 10 C.F.R. 50.54, Question 47, Parts 1a and 1b, that the liquefaction potential would be adequately addressed by maintaining this area in a dewatered condition during plant operation. Prior to March 3, 1982, Staff reviews of dewatering and liquefaction had been based on the assumption that the groundwater level in the plant power block area would be controlled to elevation 595 and limited to elevation 610, thus addressing the liquefaction concern.¹⁸⁰⁷ On March 3, 1982, the NRC Staff and its consultants met with the Applicant and Bechtel to discuss site dewatering criteria for the Midland plant. During the course of the meeting, it became apparent that there was a misunderstanding between the Staff and the Applicant as to the design basis for the dewatering system. Contrary to the Staff's understanding, noted above, Applicant stated that, based on an evaluation of site data by Bechtel's Geotechnical Engineering Group, groundwater levels at areas other than the Diesel Generator

¹⁸⁰⁵ Hood, prepared testimony regarding loose sands beneath service water piping at pp. 1-2, following Tr. 12144; Tr. 12318.

¹⁸⁰⁶ A summary of the liquefaction and dewatering issue may be found in Applicant's Proposed Findings of Fact and Conclusions of Law on Remedial Soils Issues at p. 273.

¹⁸⁰⁷ Hood, prepared testimony regarding loose sands beneath service water piping at p. 2 and Attachment 2, following Tr. 12144; Kane, Tr. 12167-12168.

Building (DGB) and the Railroad Bay Area of the Auxiliary Building (RAB) did not need to be controlled to elevation 595 nor limited to elevation 610. Applicant indicated that the foundations of the DGB and the RBA were the only structures for which liquefaction was a concern, and asked the Staff to agree that groundwater control could be limited to these two areas.¹⁸⁰⁸ Applicant did not discuss the loose sands to the north of the SWPS and CWIS.¹⁸⁰⁹

705. Because the Bechtel Geotechnical Engineering Group evaluation had not yet been provided to the Staff, and because no member of the Geotechnical Engineering Group was present at the March 3 meeting to answer questions regarding details of the evaluation or its conclusions,¹⁸¹⁰ the Staff did

¹³⁰⁸ Hood, prepared testimony regarding loose sands beneath service water piping at p. 2 and Attachment 2, following Tr. 12144; Tr. 12145, Budzik, Tr. 12188-12191. Applicant's witness Dennis M. Budzik offered an explanation for the confusion as to the design basis of the dewatering system. The system includes interceptor wells near the Service Water Pump Structure to remove groundwater seeping into the power block area from the cooling pond, and additional site dewatering wells to remove groundwater that evades the interceptor wells. This configuration was deemed easier than the installation of dewatering wells around the DGB and the RBA, and has the effect of dewatering the entire site to some extent. Site-wide dewatering, however, was not intended by the Applicant as a design basis for the system. Budzik, Tr. 12190-12192.

¹⁸⁰⁹ Budzik, Tr. 12163; Kane, Tr. 12168; Budzik, Tr. 12192-12193.

¹⁸¹⁰ See Hood, Tr. 12145-12146. Mr. Budzik testified that no members of the Geotechnical Engineering Group were present because the Applicant did not believe that liquefaction would be an issue at the meeting. The group's evaluation had not been provided for this same reason, and also because Applicant had previously submitted the raw data to the Staff. Applicant was aware that the Staff's consultant, Dr. Hada a, had independently evaluated the data. Budzik, Tr. 12195-12196.

not agree that liquefaction potential without groundwater control could be limited to the DGB and the RBA. Instead, the Staff requested the Applicant to submit the liquefaction evaluation for foundation soils above elevation 610.¹⁸¹¹

706. On March 12, James Meisenheimer called Joseph Kane of the NRC Staff. Mr. Meisenheimer indicated that he had mailed the Bechtel Geotechnical Engineering Group liquefaction evaluation to Dr. Hadala, the Staff's consultant, as requested at the March 3 meeting. According to Mr. Meisenheimer, the evaluation confirmed that loose sands existed in the plant fill above elevation 610 at locations other than the DGB and the RBA.¹⁸¹² Mr. Meisenheimer committed to addressing the Staff's concerns regarding the loose sands beneath the 26-inch diameter service water lines north of the SWPS and the CWIS by removing the loose sands and replacing them with either lean concrete or stabilized soils.¹⁸¹³ The NRC Staff has concurred with the Applicant that this replacement would obviate the need to maintain the water level in this area at or below elevation 595, thus allowing Applicant to limit dewatering to the DGB and

¹⁸¹¹ Hood, prepared testimony regarding loose sands beneath service water piping at p. 3 and Attachment 2, following Tr. 12144.

¹⁸¹² Hood, prepared testimony regarding loose sands beneath service water piping, Attachment 1, following Tr. 12144.

¹⁸¹³ Hood, prepared testimony regarding loose sands beneath service water piping, Attachment 1, following Tr. 12144. A summary of Applicant's commitment to rebed portions of these 26-inch diameter lines may be found in Applicant's Proposed Findings of Fact and Conclusions of Law on Remedial Soils Issues at pp. 235-242.

the RBA.¹⁸¹⁴ Mr. Meisenheimer's telephone call, however, was the NRC Staff's first notification of the proposed replacement work.¹⁸¹⁵

707. During the Licensing Board hearings held on February 17 and 18, 1983, there was much cross examination regarding Applicant's state of knowledge during the March 3, 1982 meeting as to the loose sands north of the SWPS and the CWIS. For example, both Darl Hood and Joseph Kane of the NRC Staff, who were both present at the March 3 meeting, recalled Applicant expressing an awareness of the Bechtel liquefaction evaluation.¹⁸¹⁶ Neither Mr. Hood nor Mr. Kane, however, could testify whether Applicant indicated that the evaluation had been reduced to a written report or if Applicant had actually reviewed the evaluation or any written report derived therefrom.¹⁸¹⁷

708. Dennis Budzik, who was present at the March 3 meeting on behalf of the Applicant, testified that no written report from the Bechtel Geotechnical Engineering group concerning liquefaction potential at the site was in existence at the time of the meeting.¹⁸¹⁸ Mr. Budzik further testified that

¹⁸¹⁴ Hood, prepared testimony regarding loose sands beneath service water piping, Attachment 1, following Tr. 12144; see also Hood, Tr. 12146.

¹⁸¹⁵ Hood, prepared testimony regarding loose sands beneath service water piping, Attachment 1, following Tr. 12144.

¹⁸¹⁶ Hood, Tr. 12158, 12162.

¹⁸¹⁷ Hood, Tr. 12157-12158, 12162.

¹⁸¹⁸ Budzik, Tr. 12195-12196, 12216-12218.

(1) he did not discuss the liquefaction issue with the Bechtel Engineering Group prior to the meeting and did not look closely at the liquefaction issue because he believed that it had been previously resolved;¹⁸¹⁹ (2) that, at the time of the meeting, he was only aware of two areas (the DGB and the RBA) where there was a potential for liquefaction;¹⁸²⁰ and (3) that during the meeting he unintentionally gave the Staff incomplete information.¹⁸²¹ Once Mr. Budzik became aware of the complete facts, he relayed this information to Mr. Hood.¹⁸²²

c. ME-55 and the rotary
drilling dispute

709. In March of 1982, Consumers Power met with the NRC Staff to discuss the temporary construction dewatering wells that were to be drilled for the service water pump structure. At the meeting, the Company provided the Staff with a detailed procedure for the installation of the wells. The rotary drilling method was specified as a part of that procedure. The Staff reviewed the procedure and, in the opinion of one of Consumers Power's witnesses, concluded, inter alia, that the rotary drilling method was acceptable for this application. Prior to this meeting, 72 of 76 temporary dewatering wells had been drilled for the auxiliary building using the rotary drilling method. Based on these events, Consumers Power personnel

1819 Budzik, Tr. 12201, 12209-12210, 12236-12237, 12188.
1820 Budzik, Tr. 12201-12202.
1821 Budzik, Tr. 12256.
1822 Budzik, Tr. 12193, 12302.

believed that the rotary drilling method was acceptable to the Staff.¹⁸²³

710. On April 30, 1982, this Licensing Board issued its Memorandum and Order (Imposing Certain Interim Conditions Pending Issuance of Partial Initial Decision). Because of the April 30 order, Consumers Power prepared and mailed a letter to the NRC Staff on May 10 outlining Applicant's understanding of work that had previously been authorized by the Staff. This letter included references to the auxiliary building and service water pump structure temporary dewatering wells.¹⁸²⁴ On May 25, the Staff responded to the May 10 letter, describing the Staff's opinion of the work approvals that Applicant had previously received.¹⁸²⁵

711. On May 26, Consumers Power personnel telephoned the Staff to inquire if they could proceed with the installation of additional temporary dewatering wells, including the well designated as ME-55, for the auxiliary building. During the telephone call, the Staff expressed concerns regarding the monitoring of fines in the wells, and Consumers Power agreed to implement the monitoring criteria; however, there was no discussion regarding the method of drilling the wells. Company personnel believed that the May 26 telephone call fulfilled the

¹⁸²³ Wheeler, prepared testimony on quality assurance at p. 2, following Tr. 18784; Tr. 18788-18789.

¹⁸²⁴ Staff Exhibit No. 26, Attachment 3; Wheeler, Tr. 18789.

¹⁸²⁵ Staff Exhibit No. 26, Attachment 4; Gilray, October 29, 1982 prepared testimony for underpinning activities, Attachment 1, following Tr. 16854; Wheeler, Tr. 18789.

applicable requirements for Staff notification with respect to the additional temporary wells for the auxiliary building.¹⁸²⁶

712. In late May or early June, Consumers Power contacted the Region III NRC inspectors to set up a meeting to discuss the May 25 NRC Staff letter. The purpose of this meeting was to insure that all parties had a complete understanding and were in agreement as to the extent of authorized work activities at the site.¹⁸²⁷ The meeting was held on June 10. During the meeting, a question was raised as to whether the rotary or cable tool method was appropriate for the drilling of the additional temporary dewatering wells at the auxiliary building.¹⁸²⁸

713. Because of the uncertainty regarding the appropriate drilling method, the parties decided to contact Mr. Joseph Kane of NRR. Mr. Kane concluded that, according to the May 25 letter, the cable tool method should be used. It was not clear, however, what NRR's or the NRC Staff's concerns were regarding the rotary method.¹⁸²⁹

714. Based on Mr. Kane's interpretation of the May 25 letter and the need to resolve the apparent confusion, Applicant on June 11 issued a stop work letter covering temporary

1826 Wheeler, prepared testimony on quality assurance at pp. 2-3, following Tr. 18784; Wheeler, Tr. 18789-18790.

1827 Wheeler, Tr. 18790.

1828 Wheeler, prepared testimony on quality assurance at p. 3, following Tr. 18784; Wheeler, Tr. 18791.

1829 Wheeler, prepared testimony on quality assurance at p. 3, following Tr. 18784; Wheeler, Tr. 18791.

well ME-55. No drilling had taken place. Subsequently, during a June 25, 1982 audit and meeting with the NRC Staff, the acceptability of the rotary method for drilling the additional auxiliary building wells was confirmed.¹⁸³⁰ In addition, other temporary dewatering wells have been so effective in reducing the water levels in the plant area that Consumers Power has elected not to install ME-55.¹⁸³¹

d. The feedwater isolation
valve pit load test dispute

715. Portions of the structural steel supports for the feedwater isolation valve pit ("FIVP") were originally installed by the Applicant in 1971 as a non-"Q" structure.¹⁸³² A non-"Q" load test was successfully conducted in June of 1981 to demonstrate that the steel support system was capable of supporting the calculated weight of the FIVP.¹⁸³³

716. In June of 1982, Consumers Power presented a plan to the NRC Staff which called for modifications to the FIVP support system. Applicant proposed the modifications to provide increased margins of safety.¹⁸³⁴ In a letter from Con-

¹⁸³⁰ Wheeler, prepared testimony on quality assurance at p. 3, following Tr. 18784; Wheeler, Tr. 18791.

¹⁸³¹ Wheeler, Tr. 18815-18816.

¹⁸³² Wheeler, Tr. 18855; Wheeler, prepared testimony on quality assurance at p. 4, following Tr. 18784.

¹⁸³³ Wheeler, prepared testimony on quality assurance at p. 4, following Tr. 18784.

¹⁸³⁴ Id. Wheeler, prepared testimony on quality assurance at p. 4, following Tr. 18784.

sumers Power to Harold Denton dated June 18, 1982, an attachment entitled "Supplemental Information on Feedwater Isolation Valve Pits" described the construction restriction related to excavation near the FIVP, i.e., that the support system adequacy would be verified prior to excavating under the FIVP.¹⁸³⁵ It was Applicant's position that the FIVP support modification and the new proof load test were only required for excavation work directly under the FIVP. Therefore, Applicant believed that excavations which did not go directly under the FIVP could begin prior to completion of the FIVP support modifications or proof load testing.¹⁸³⁶

717. The NRC Staff was originally of the opinion that proof load testing of the modified structural steel should take place before any excavation. In addition, the Staff requested that Consumers Power inspect the structure, even though it had been installed non-"Q".¹⁸³⁷ Applicant inspected the structure and noted several differences from design drawings or specifications. These differences were reviewed and approved by Engineering as is.¹⁸³⁸

¹⁸³⁵ Wheeler, prepared testimony on quality assurance at p. 4, following Tr. 18784.

¹⁸³⁶ Wheeler, prepared testimony on quality assurance at p. 4, following Tr. 18784.

¹⁸³⁷ R. Cook, Tr. 18878-18879; Wheeler, prepared testimony on quality assurance at p. 5, following Tr. 18784.

¹⁸³⁸ Keppler, prepared testimony with respect to quality assurance, Attachment B, paragraph 4, following Tr. 15111; Wheeler, prepared testimony on quality assurance at p. 5, following Tr. 18784.

718. After several discussions between Applicant and the Staff, it was agreed that the modifications and the new load test did not have to be completed prior to the underpinning excavation of the drift to pier 12.¹⁸³⁹ Thus, Consumers Power was allowed to proceed with excavation work that was not directly under the FIVP.¹⁸⁴⁰

4. Conclusion

719. The Board finds very little in the above litany of difficulties of common origin. We did note that the drilling problems discussed above indicated a need for formal procedures and have resulted in the introduction of the Excavation Permit System. The only common problem pointed up by the latter problems has been a tendency for Consumers Power and the Staff to miscommunicate. This problem appears to have ameliorated in recent months.

B. Concerns About Cracking

1. Cracks in the containment

720. In an NRC inspection report, the Staff noted that cracks had been found in the containment wall which had not been previously reported by Consumers Power.¹⁸⁴¹ Staff witnesses testified that the fact that Consumers Power did not

¹⁸³⁹ Wheeler, prepared testimony on quality assurance at p. 5, following Tr. 18784.

¹⁸⁴⁰ Wheeler, prepared testimony on quality assurance at p. 5, following Tr. 18784.

¹⁸⁴¹ Shafer and Landsman, Tr. 14594-14600.

discover these cracks was not indicative of a problem with the applicant's QA program since there was no requirement to monitor the containment building for cracks.¹⁸⁴²

721. On June 27, 1983, Ms. Stamiris moved to reopen the OM record in order to litigate questions concerning the containment cracks. This Board denied that motion on the grounds that Ms. Stamiris had failed to establish a set of facts which would bring these issues under OM contention four and on the grounds that safety concerns were of insufficient significance to warrant a reopening of the record. However, the Board required that Consumers Power undertake a crack monitoring program to which it committed itself in its response to Ms. Stamiris' motion.¹⁸⁴³

2. SWPS cracking

722. Dr. Landsman raised a concern about cracking in the service water pump structure ("SWPS").¹⁸⁴⁴ Mr. Mooney testified that he was familiar with cracks in the SWPS. However, Mr. Mooney was not aware of any new cracks which had developed recently. He believed that the incident to which Dr. Landsman referred had to do with the fact that, at a routine mapping of the SWPS cracks, there was an indication that certain of the cracks may have grown since the previous mapping to the point where they reached the 0.030 inch alert limit. In

1842 Id.

1843 ASLB Memorandum and Order dated August 17, 1983.

1844 Landsman, Tr. 14659.

accordance with procedures, Consumers Power brought CTL on site in order to evaluate these cracks. CTL measured the cracks and determined that they were the same cracks as had been previously evaluated and that they had not in fact increased in width. A copy of CTL's report on the SWPS cracks was provided to Dr. Landsman.¹⁸⁴⁵

C. Miscellaneous Balance of Plant Concerns

1. Reinspection of electrical cable installations

723. Mr. John Rutgers, Bechtel's Manager for the Midland Plant, testified concerning the adequacy of the reinspection program for electrical cables. The qualifications of certain electrical QC inspectors were questioned as a result of a May, 1981 NRC inspection.¹⁸⁴⁶ MPQAD initially performed overinspections of 100 percent of the work done by all but one of these inspectors and of 50 percent of the work done by the one remaining inspector. This overinspection involved a check of 1,084 cables; 55 cables were found to be misinstalled in part. The results of the overinspections were analyzed in order to ensure that each identified problem was understood and appropriate

¹⁸⁴⁵ Mooney, Tr. 17154-17156.

¹⁸⁴⁶ Rutgers, prepared testimony on quality assurance at p. 2, following Tr. 18035, see also, paragraphs 330-337 of Consumers Power Company's Proposed Supplemental Findings of Fact and Law for Partial Initial Decision on Quality Assurance and Management Attitude Issues; at 427-447 of CPCo's Response to the NRC Staff Proposed Supplemental Findings of Fact and Conclusions of Law for Partial Initial Decision on Quality Assurance and Management Attitude Issues.

corrective action taken. For the types of misinstallations which could cause a problem for safety if they occurred elsewhere in the plant, actions were taken to identify and dispose of the concerns.¹⁸⁴⁷

724. The NRC Staff believed that all the misinstallations were of safety significance and rejected Consumers Power's proposed corrective action. The Staff requested that all Class 1E cables be reinspected in order to ensure correct routing.¹⁸⁴⁸ Consumers Power agreed to do this reinspection. As of the date of Mr. Rutgers' testimony, the reinspection was approximately 91 percent complete. Because Consumers Power has undertaken a 100 percent reinspection of all Class 1E cables, the NRC Staff's concern that only a partial overinspection was done has been addressed.¹⁸⁴⁹

2. Reinspection of pipe support installation

725. A May, 1981 NRC Inspection revealed nonconformance in the area of pipe support installations. In response, MPQAD overinspected a sample of 123 pipe supports installed prior to January 1, 1981 in order to assess the acceptability

¹⁸⁴⁷ Gardner, Tr. 14386; Rutgers, prepared testimony on quality assurance at pp. 2-4, following Tr. 18035.

¹⁸⁴⁸ Rutgers, prepared testimony on quality assurance at pp. 2-4, following Tr. 18035.

¹⁸⁴⁹ Rutgers, prepared testimony on quality assurance at p. 4, following Tr. 18035; Keppler, October 29, 1983 prepared testimony with respect to quality assurance, Attachment A at p. 2 and Attachment B at p. 1, following Tr. 15111; see also, Rutgers, Tr. 18048-18055.

of the original installations and inspections. Fifty-five of the 123 supports inspected were found to have at least one nonconforming condition. However, Consumers Power concluded that none of the nonconforming conditions presented a safety concern. These findings were presented to the NRC Staff in a report submitted in August, 1982. The report analyzed the nonconforming conditions and classified them into 14 groups. The analysis was done, according to Mr. Rutgers, in order to assist in ensuring that the problem was understood and for the purpose of determining the significance of the nonconformances and the appropriate corrective actions.¹⁸⁵⁰

726. The NRC Staff believed that the nonconforming conditions were all of safety significance and that a complete reinspection was needed to ensure that all misinstallations were identified. The NRC requested that Consumers Power reinspect all pipe supports installed prior to January, 1981 and reinspect samples of pipe supports installed after that date.¹⁸⁵¹

727. The hanger reinspection program developed by Consumers Power provides for the reinspection of all installed pipe supports regardless of when they were installed or turned over. In addition, other improvements, such as checkoff lists for craftspeople and field engineers, simplification of specification interpretation, and an improved space control program,

¹⁸⁵⁰ Rutgers, prepared testimony on quality assurance at pp. 5-6, following Tr. 18035.

¹⁸⁵¹ Rutgers, prepared testimony on quality assurance at p. 7, following Tr. 18035.

were adopted to improve the quality of pipe support installations. Consumers Power also decided to revise the applicable Project Quality Control Instructions. Mr. Rutgers testified that the reinspections and the planned corrective actions would ensure the adequacy of pipe support construction.¹⁸⁵²

3. Material storage

728. Mr. Shafer and Mr. R. Cook of the NRC Staff testified concerning ongoing problems in the area of material storage and maintenance. They indicated that Consumers Power should take greater initiative in this area in identifying and correcting problems.¹⁸⁵³ Mr. Rutgers testified that Consumers Power and Bechtel are both committed to proper storage and maintenance. He acknowledged that problems related to storage have occurred, but he also emphasized that corrective steps have been taken when such problems have arisen. Actions that have been taken to respond to concerns with regard to material storage include a task force that was active in 1980, routine auditing, computerization for tracking storage intervals, weekly checks of the Poseyville lay-down area by field engineering, retraining of procurement personnel responsible for marking steel, and formal quality control inspections undertaken weekly rather than monthly.¹⁸⁵⁴

¹⁸⁵² Id. at pp. 7-8; see also, Rutgers, Tr. 18056-18080.

¹⁸⁵³ Shafer and R. Cook, Tr. 14390-14393.

¹⁸⁵⁴ Rutgers, prepared testimony on quality assurance at pp. 10-13, following Tr. 18035; Rutgers, Tr. 18094-18097.

4. Support of electrical cables

729. Concerns were raised concerning the support of electrical cables awaiting routing or termination.¹⁸⁵⁵ Mr. Rutgers described the difficulties inherent in fulfilling in-process requirements for the installation of cables. He stressed that there was awareness of the problem involving adequate cable coil support and end-capping. To address the problem, prompt action has been taken to correct nonconforming conditions in this area and construction management and the electrical superintendents advise their supervisors and foremen to call for improved performance in this area. These actions are in addition to the procedures which provide instruction concerning support of cable coils. There is now also a check for proper coil support in the in-process inspection PQCI. This instruction requires weekly inspection of selected plant areas for conformance to coil support installation attributes. A continuing orientation program for electrical supervisors, foremen, and craftspersons in the electrical field installation procedures was also cited by Mr. Rutgers as indicating the commitment of the project to adequate support of cable coils.¹⁸⁵⁶

5. Design adequacy

730. Dr. Landsman testified that there are obvious design deficiencies at the plant which reflect an inability on

¹⁸⁵⁵ Keppler, October 29, 1982 prepared testimony with respect to quality assurance, Attachment B, paragraph 5, following Tr. 15111.

¹⁸⁵⁶ Rutgers, prepared testimony on quality assurance at pp. 13-15, following Tr. 18035; Rutgers, Tr. 18097-18103.

the part of the engineers to adequately design the plant. Landsman gave as an example of the design of the control tower and electrical penetration areas which he said were cantilevered off of the main auxiliary and placed on compacted fill.¹⁸⁵⁷ He also took issue with the design of the service water pump structure cantilever with the back of the structure sitting on compacted fill. Finally, he cited the design of the diesel generator building with a spread footing on fill material as being another deficiency. He stated that "[n]o engineering company would ever design cantilever structures like that."¹⁸⁵⁸ By describing these structures as having design deficiencies, Dr. Landsman explained that he was stating his opinion concerning the adequacy of the design, but did not mean that the original designs would not have been licensable.¹⁸⁵⁹ Messrs. R. Cook, Shafer, and Gardner did not express opinions concerning the design adequacy because they believed it was a matter outside their technical knowledge.¹⁸⁶⁰ Dr. Landsman had not previously communicated his concerns regarding design to anyone in the NRC.¹⁸⁶¹

1857 The control tower and electrical penetration areas were not designed to cantilever from the main auxiliary building. See Applicant's Proposed Findings of Fact and Conclusions of Law on Remedial Soils Issues, dated August 5, 1983, at paragraph 218.

1858 Landsman, Tr. 15059-15060; see also Landsman, Tr. 16306-16320, 16589-16591.

1859 Landsman, Tr. 16807-16817.

1860 R. Cook, Shafer, and Gardner, Tr. 16319-16320.

1861 Landsman, Tr. 16317-16319, 16428-16329, 16434.

731. Mr. Hood of NRR stated that the use of spread footings is not considered a design deficiency per se. The NRC has found the DGB to be acceptable.¹⁸⁶² Mr. Thomas, a civil engineer with experience in nuclear plant design, testified that the auxiliary buildings at Palo Verde were designed with stepped foundations resting partially on fill and partially on natural material and that the NRC found this foundation design to be acceptable. He further testified that the DGB at the Turkey Point plant was supported by a spread footing and placed on fill material. In addition, the DGBs at Palo Verde have spread footings and are partially founded on fill material.¹⁸⁶³ Mr. Thomas' purpose in testifying as to these other plants was to support his opinion that it is not contrary to accepted engineering practice to design the foundations of the DGB and auxiliary building in a way that Dr. Landsman described. He disagreed with Dr. Landsman's statement that no one would design structures in that way.¹⁸⁶⁴

¹⁸⁶² Hood, Tr. 16424-16425, 16431-16432. Board Notification 83-165, dated October 26, 1983, concerns a report on the adequacy of the DGB, that was prepared as a result of the concerns expressed by Dr. Landsman. The NRC is currently reviewing the report to determine the impact, if any, on existing Staff positions. The report concluded that "there is reasonable assurance that the structural integrity of the DGB will be maintained and its functional requirement fulfilled." However, the report questions whether the stresses in the DGB can meet the FSAR criteria. The Board has left open the question of whether further hearings related to this report are needed. Tr. 21314-21317.

¹⁸⁶³ Thomas, Tr. 20221-20225.

¹⁸⁶⁴ Thomas, Tr. 20229, 20235-20237, 20239-20240, 20258-20261, 20283-20287.

6. Design v. As-Built
condition of the plant

732. The results of the DGB inspection indicate a problem with adhering to design requirements.¹⁸⁶⁵ Other examples cited of the as-built condition of the plant not being as indicated on design drawings include problems with the location of underground utilities, the structural steel for the FIVP, and the placement of lean concrete backfill beneath the FIVP.¹⁸⁶⁶ Consumers Power has incorporated reviews in the CCP which address the question of the conformance of the as-built condition of the plant with the drawings.¹⁸⁶⁷

7. Welding procedures

733. On November 30, 1982, approximately 150 Zack workers were laid off due to concerns with certification to welding procedures that were discovered during an MPQAD audit. In April 1983, approximately 60 additional welders were laid off at Photon Testing Laboratories, a Zack subcontractor, because of the improper certification to welding procedures.¹⁸⁶⁸ The shutdown of the Zack HVAC work demonstrates the effectiveness of the MPQAD organization in identifying the problem and taking all necessary actions to correct it.¹⁸⁶⁹

¹⁸⁶⁵ Gardner, Tr. 15051-15052; Landsman, Tr. 15055; Landsman and R. Cook, Tr. 15766-15768.

¹⁸⁶⁶ Landsman, Tr. 14621, 15775-15790.

¹⁸⁶⁷ J. Cook, Tr. 18475-18476; R. Cook, Tr. 15767-15769;
see also, Paragraphs 492-503, infra.

¹⁸⁶⁸ Wells and J. Cook, 18221-18223, 18259-18260.

¹⁸⁶⁹ J. Cook, Tr. 18348-18349.

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Board 1a	2/15/79	Memo	Keppler	Thornburg	Midland Summary Report	1866	1875	7/13/81
Board 1b	10/18/79	Memo	Fiorelli (NRC)		Midland Construction Status as of 10/1/79	1866	1875	7/13/81
Board 1c	3/15/79	Letter	Keppler	Howell	Meetings of 2/23/79 and 3/5/79 (NRC prelim. investigation findings and CPCo responses)	1868	1875	7/13/81
Board 1d	3/12/79	Memo	Keppler	Thornburg	Meetings of 2/23/79 and 3/5/79 between NRC, CPCo and Bechtel	1869	1875	7/13/81
Board 2					3 pages including letter transmitting PSAR amendment No. 3 (Dames & Moore report) to NRC and letter transmitting report to Bechtel (First 3 pages to Stamiris Ex. 5)	2523	2523	7/16/81
Board 3	11/4/77	Audit Report F 77-32	CPCo		Soil Placement Records	6530	6530	12/16/81

Midland OM/OI Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Joint 1	6/5/81	Stipulation (Applicant/Staff)			QA	1171	1188	7/8/81
Joint 2	12/1/81	Stipulation (Applicant/Staff)			Aux. Bldg.	5437	5447	12/1/81
Joint 3	2/9/81	Stipulation Applicant/Staff)			EWST and underground piping	7162	7164	2-16/82
Joint 4	---	Stipulation (Applicant/Staff)			SWPS	9638	9639	11/19/82
Joint 5	---	Stipulation (Applicant/Staff)			DGB	10613	10616	12/8/82
Joint 6	1/31/83 2/7/83	Stipulation (Applicant/Staff)			Material False Statement in FSAR re: Fill & Backfill was unintentional.	11321	11344	2/14/83

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Holt 1	-	SSRS Figure 1.2			Proposed Midland SSRS for original ground surface (modified at longer periods), 5% critically damped	4540	4540	10/13/81
Holt 2	-	SSRS Figure 7			84th percentile SSRS for top of fill material and design spectrum for Midland, 5% critically damped	4540	4540	10/13/81
Holt 3	10/14/80	Letter	Tedesco	J. Cook	Seismological input for Midland	4540	4540	10/13/81
Holt 4	1931	Article in Bulletin of Seismological Soc. of America	Wood & Neumann		Modified Mercalli Intensity Scale	4540	4540	10/13/81
Holt 5	2/81	Report	Weston Geo-physical	CPCo	Midland SSRS, Part I: Response Spectra-SSE Original Ground Surface	4540	4540	10/13/81
Holt 6	6/81	Report	Weston Geo-physical	CPCo	Midland SSRS, Addendum to Part I	4540	4540	10/13/81

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Holt 7	7/81	Report	Weston Geo- physical	CPCo	Basis for Rejection of 1966 Parkfield Earthquake Accelerograms for use in Midland SSRS	4540	4540	10/13/81
Holt 8	4/81	Report	Weston Geo- physical	CPCo	Midland SSRS, Part II: Response Spectra Applicable for the Top of Plant Fill Material	4540	4540	10/13/81
Holt 9	2/81	Report	Weston Geo- physical	CPCo	Midland SSRS, Part III: Seismic Hazard Analysis	4540	4540	10/13/81
Holt 10	-	Typed Summary w/ attached Figs. 1-5			Summary of Applicant's Position with respect to Midland SSRS (summary of the formal probabilistic analysis in Holt Ex. 9)	4551	4551	10/13/81
Holt 11	-	SSRS Figure 7 (modified)			84th percentile SSRS for top of fill material and design spectrum for Midland, 5% critically damped. (Identical to Holt Ex. 2, except response spectra modified in low frequency and to coincide with Midland design spectrum, i.e., FSAR spectrum)	5117	5118	10/15/81

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Staff 1	7/13/81	Letter	Keppler	Cook	Transmitting I&E 81-12 regarding 5/18-22/81 MPOAD assessment	1889	1891	7/13/81
Staff 2	7/27/81	Letter	Cook	Keppler	Response to Immediate Action Letter (IAL) of 5/22/81 re: Small Bore Piping	3018	3030	8/5/81
Staff 3	7/27/81	Letter	Cook	Denton	Transmitting Woodward-Clyde Consultants' final report dated 7/1/81	3491	3491	8/7/81
Staff 4	5/27/81	MAC Final Report	Management Analysis		QA Audit	3732	3732	8/8/81
Staff 5 (First One)	1980	Earthquake Frequency Map	Consultant to NRC	NRC	Attachment to NUREG Report CR 1577 "An Approach to Seismic Zonation for Siting Nuclear Electric Power Generating Facilities in Eastern U.S."	4773	4775	10/14/81
Staff 5 (Second One)	11/24/81	Letter	Tedesco (NRC Staff)	Cook	Staff Consurrence for Construction of Access Shafts and Freeze Wall in Preparation for Underpinning Aux. Bldg. and Feedwater Isolation Valve Pits	5447	5467	12/1/81

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Staff 6	9/30/81	Letter; Seismic Model Reports for Aux. Bldg. and SWPS	Cook	Denton	Seismic Models and Aux. Bldg. soils remedial work	6065	6069	12/14/81
Staff 7	8/81	SALP Appraisal (NUREG 0834)	NRC - SALP Review Group		Licensee Assessments - Final Report	6162	6429	12/16/81
Staff 8	1/2/81	Letter	Keppler	Moseley	Transmitting (1) Action Plan resulting from 11/24/80 meeting (2) Report of 11/24/80 meeting, including I&F 80-35 and 80-36.	6166	6170	12/15/81
Staff 9	5/81	SALP Working Paper	Wessman's supervision	Used by national SALP team	Midland Assessment	6170	6173	12/15/81
Staff 10	3/31/81	SALP Input Memo	Hood as Project Manager		Midland Assessment: Based on comments at 11/24/80 meeting but also information acquired in the intervening period.	6174	6175	12/15/81
Staff 11A Staff 11B	4/23/81	Computer Printouts	Office of I&E	Wessman	Midland Non Compliances for 1979-80	6177	6179	12/15/81

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Staff 12	11/30/81	MPQAD Reporting Relationships (Draft)	CPCo		Midland QA reorganization as of 11/81	6707	6711	12/17/81
Staff 13	12/10/81	Memo	Hood		Telephone Conf. Call 12/8/81 re: additional temporary dewatering wells	6900	6901	12/17/81
Staff 14		SERs			SER, SSER #1, SSER #2 Errata		8714	11/15/82
Staff 15	3/17/81	SCRE 12	CPCo		Pipe Corrosion	8968	8971	11/16/82
Staff 16		Figure	Bechtel		Settlement of DGB post-9/14/79	10463	10404	12/7/82
Staff 17	7/19/82	FES				12661	12662	3/9/83
Staff 18	4/7/83	IR 83-03	JGK	CPCo	Documenting nonconformances with Attachment 10 forms rather than the required corrective action forms	14407	14411	4/27/83
Staff 19	2/82	Handwritten note	Sevo		5 items; headed "Priority Items - Civil"	14417	14420	4/27/83
Staff 20		Resume	Landsman		Landsman's qualifications	14517	14518	4/28/83

Midland OM/UL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Staff 21		Chronology	JGK		Midland Chronology Since 7/81 Hearings (Prepared by JGK in preparation for hearings)	15486	15487	5/3/83
Staff 22	1/18/83	IR 82-13	JGK	JWC	Investigation of 4/6-6/17/82 into whether misleading info was given to NRC on 3/10 and 3/12 re installation of underpinning instrumentation.	7422	17529	6/8/83
Staff 23	3/4/83	Report	Bechtel		Peck Affidavit & DGB Dewatering Settlement Report	20587	20587	9/20/83
Staff 24	7/1/81-3/31/83	Report	NRC	CPCo	SALP III report with attachments, cover letter: 9/16/83 Keppler to Cook	20640	20642	9/21/83
Staff 25	9/15/83	Figure	Bechtel		Drawing re: Settlement Marker Location Plan, DGB	21217	21217	10/31/83

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Staff 26	6/2/83	Investigative Report	01		Investigative Report re: violation of Board Order	21331	21349	11/1/83
Staff 27 (minus pps. 4-5 of Att. 4)	9/12/83	Investigative Report	01		Investigative Report re: violation of Board Order	21332	21349	11/1/83
Staff 28	9/12/83	Memo	Keppler	Hayes	Memo re: Midland NPS-Alleged Violation of Board Order	21355	21675	11/2/83
Staff 29	6/2/83	Memo	Keppler	Hayes	Memo re: Midland NPS-Alleged Violation of Board Order	21356	21951	11/4/83
Staff 30	7/19/82	Letter	Purple	Cook	Letter re: SSER No. 11 on Soils Related Issues	22226	22228	11/8/83
Staff 31	10/15/83	Deposition			Deposition of John J. Donnell taken in Las Vegas on 10/15/83	22601	22602	12/3/83
Staff 32	10/27/83	Ct. Paper	CPCo	Stamiris	Applicants Responses to Stamiris Interrogatories of 10/11/83. (Responses to #21 & 22)	22659	22660	12/3/83
Staff 33	8/24/82	Memo	Landsman	Shafer	Re: meeting on 5/20/82 to discuss deep "Q" duct bank	22666	22667	12/3/83

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Staff 34	8/20/82	Memo	Keppler	Fitzgerald	Requesting 01 investigation of Board Order violation re: Landsman's inspection	22669	22670	12/3/83

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
CPCo 1	1975-81	Handwritten Tabulation			Tabulates QA, QC and manual personnel on site between 12/75 and 7/81	1516	1518	7/10/81
CPCo 2	1/12/81	Letter	Keppler	Cook	I & E 80-10 and 80-11 re: Zack (HVAC) allegations	1644	1647	7/10/81
CPCo 3	1/30/81	Letter	Cook	Stello	CPCo Response to Zack non compliance allegations	1644	1647	7/10/81
CPCo 4	11/20/81	Letter	Cherry	Keppler	CPCo withholding info from NRC and allegations re: resident inspector	2027	2043	7/13/81
CPCo 5	12/14/81	Letter	Keppler	Cherry	Response to 11/20/78 letter (with attachments)	2029	2043	7/13/81

Midland GM/CL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
CPCo 6	12/18/80	Letter	Keppler	Cook	I & E 80-35, 80-36 re: SALP	2037	2043	7/13/81
CPCo 7	8/24/79	Memo	Hood	File	8/16/79 internal meeting on status of soils settlement	2691	2696	7/17/81
CPCo 8		Draft notes (typed) "Trend Analysis"	Turnbull			2766	2777	7/17/81
CPCo 9	4/20/81	"Discussion copy, Summary of Meeting on Trend Analysis."	Keating		Trend analysis review meeting of 4/16/81	2768	2777	7/17/81

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
CPCo 10	post 4/10/81	Handwritten notes (4 pp.)			Trending (follows generally the outline of CPCo Ex. 9)	2770	2777	7/17/81
CPCo 11	5/19/81	Memo	Turnbull	Bird Marquaglio Dietrich	Trend Program Phase III	2772	2777	7/17/81
CPCo 12	6/16/81	MPQA Site Operating Manual			Trend Analysis Phase III	2774	2777	7/17/81
CPCo 13	7/13/81	MPQAD Organization Chart				3061	6062	8/ 5/81

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
CPCo 14	2/ 9/81	Letter	Cook	Keppler	Response to 1/12/81 letter transmitting I & E 80-32/80-33	3195	3918	8/10/81
CPCo 15		"Line Width-Miles;" 11/24/81 Letter Todesco to Cook	Johnson, Corley et al.		Crack sizes	5578	5757	12/ 2/81
CPCo 16	10/26/81	Woodward-Clyde Report (Part 2)	Woodward-Clyde	CPCO	Aux. Bldg. Test Results: Soil boring and testing program.	5760	5774	12/ 2/81
CPCo 17	10/13/81	Letter	Keppler	Cook	Payment of \$38,000 civil penalty by CPCo	6297	6306	12/15/81

Midland GM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
CPCo 18	2/ 3/81	Letter	D. Thompson (NRC)	Howell (CPCo)	Payment of \$38,000 civil penalty by CPCo	6301	3606	12/15/81
CPCo 19	12/ 3/81	Letter	Brunner	Bechhoeffer	New MPQAD organization	6440	6446	12/16/81
CPCo 20	11/23/81	Organization chart	CPCo		MPQAD reorganization	6444	6446	12/16/81
CPCo 21	1/26/82	Letter	Cook	Keppler	QA Reorganization	6919	6922	2/ 2/82
					Enclosures:			
					(1) QA Topical Report (Chart)			
					(2) QA Topical Report (Chart)			
					(3) QA Department Procedure			
					(4) QA Chart dated 1/22/82			
CPCo 22	12/14/81	Audit Report 11/2-6/81	CPCo		Bechtel QC inspector training program	6937	6940	2/ 2/82
					Attachments:			
					(1) Audit observations			
					(2) Audit checklists			

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
CPCo 23	7/24/81	Audit Report 6/2-7/3/81	CPCo		Bechtel QC inspector training Attachments: (1) Audit Finding Reports (2) 10/29/81 Letter Turnbull to Bechtel re: Unresolved Items (3) 10/15/81 Letter Turnbull to Bechtel re: unresolved Item 03 (4) 10/9/81 Letter Bechtel to Turnbull re: URI's.	6937	6940	2/ 2/82
CPCo 24	2/ 1/82	Letter	Miller	Board	Hold point testimony of BWM subject to misinterpretation	7120	7122	2/ 2/82
CPCo 25		Group of Boring Logs and Charts			Response to Harbour question re: what the rotation or torsion of BWST valve pit would be if racking occurred.	7939	7946	2/19/82

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
CPCo 26		Hendron drawing				8627	8628	11/15/82
CPCo 27		Drawing			Aux. Bldg. deflection	9428	9428	11/18/82
CPCo 28		Drawing			SWPS	9541	9541	11/19/82
CPCo 29 (R)		Drawing			DGB Crack monitoring	11070	11073	12/10/83
CPCo 30		Report	Matra (NRC)		DGB Structural Reanalysis	11126	11128	12/10/82
CPCo 31		Calculation sheet	BPCo		OBS-4	11752	11752	2/16/83
CPCo 32	3/28/83	Savage Dep	Savage		Steam Generator	14111	Relevant portions designated in Applicant's letter to the Licensing Board, dated 4/12/83, and in the NRC Staff's letter to the Licensing Board, dated 5/13/83	
CPCo 33		Report	S&W		Independent Assessment of Underpinning: 90 day report (green binder)	15581	17344	6/17/83

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
CPCo 34	9/9/82	Resume	Meisenheimer		J. Meisenheimer qualifications	15589	19636	7/30/83
CPCo 35	4/13/83	Paragraph	Sucharski R. III		Noncompliances for Reg. III Plants under construction	16231	16285	5/6/83
CPCo 36	11/19/82	Memo	Smith (Bechtel QC)	CQCE	QC position or inspections and documentation of deficiencies; recommend use of IPINS and/or NCRS.	16267	18711	6/29/83
CPCo 37	12/ 2/82	Letter	Curland	Smith (Bechtel AC)	See Ex. 36. Use of IPINS to be eliminated.	16275	18711	6/29/83
CPCo 38	1/26/83	Letter	Wells	Rutgers	Elimination of use of IPINS	16280	18711	6/29/83
CPCo 39		FSAR Drawing	Palo Verde		Drawing from Palo Verde FSAR Fig. 2.5-76 Amend 7	16392	Not in evidence	
CPCo 40		FSAR Drawing	Byron Braidwood		Byron and Raidwood FSAR Fig. 3.8-45	16400	Not in evidence	

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
CPCo 41		Figure, 4 pp.	South Texas		South Texas Project -- Fig. 1.3-1	16401	Not in evidence	
CPCo 42		50.54(f) Response (portion)	CPCo		Q1 and Q23 (portions)	16415	Not in evidence	
CPCo 43		Figure	Monticello		Monticello FSAR fig., describes a structure using spread footing foundation on compacted fill.	16435	Not in evidence	
CPCo 44	5/ 6/83	Letter	D.B. Miller	NRC/ Harrison	Revision 6 to MFQP-1	16978	17013	6/ 4/83
CPCo 45	4/ 6/82	Notes	Weil		April 6 Interview with Landsman; includes Landsman's notes from either 4/6 or 3/10.	17716	17959	6/10/83
CPCo 46		Organizational Chart	Wells		MPQAD	18015	18024	6/27/83
CPCo 47		Memo (Bechtel's Midland Site Mgr.)	Herzer	Rutgers	Clarify MPQAD's assumption of QC tasks.	18020	18024	5/27/83

Midland CM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
CPCo 48	6/10/83	Letter	CPCo	NRC	Describes current status of documentation re: CCP	18021	18024	6/27/83
CPCo 49	6/24/83	Letter	Cook	NRC	Additional info requested on response to N.O.V.	18922	18926	6/30/83
CPCo 50	5/12/83	QA doc/report	Don Miller	Harrison/ NRC	Letter with attached "Evaluation of Pressures in lines of grouting equipment."	19184	19184	7/28/83
CPCo 51	7/12/83	Letter	Cook	Keppler	Letter to NRC re amended response to NRC Region III letter dated 5/23/83	19459	19459	7/29/83
CPCo 52	12/13/82	Memo	Meisenheimer	MPQAD Soils	Discontinuing IPIN usage in soils area	19637	19639	7/30/83
CPCo 53	7/11/83	Oral communication record	Meisenheimer		NRC call re update Region III on IPINs used for soil work.	19650	19651	7/30/83
CPCo 54	2/20/82 & 2/21/82	Memo w/attachments			List of materials re withdrawal slips to release materials in craftsman			8/1/83
CPCo 55	2/24/82	Daily Time Sheets			Daily time reports for electricians			8/1/83

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
CPCo 57	2/82	Pages from FCAR re Midland			Pages Mr. Thomas received re Midland's foundation design for Aux Bldg revisions 41, 18, 21, 47, 42			Not admit.
CPCo 58	7/15/83	Letter w/ attachments	Mooney	Harrison/ NRC	CPCo written response to NRC's questions re drilling in soil near SWPS, in Q. Concrete and S&W report 41 questions			8/3/82
CPCo 59	7/12/83- 7/15/83	Handwritten notes	Written by Walker	Notes fr. conversations w/ J. Donnell	Handwritten notes of Donnell comments	21425	21494	11/1/83
CPCo 60		5 figures			5 figures of Utility Crossings at freeze wall	21705	22053	11/4/83
CPCo 61	12/21/81	Letter	NRC, Hood	CPCo	Letter, Telecon Summary of conversation re: freeze wall effects	21691	21952	11/4/83
CPCo 62	6/18/83	Notes	Weil		Handwritten notes of interview w/Landsman	21899	21952	11/4/83

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
CPCo 53		Events			Chronology of events for Pit #4, deep Q	21960	22428	11/4/83
CPCo 64	4/30/82- 1/6/83	Notes			Handwritten notes by Wheeler re: deep Q duct bank	22118	not admitted	
CPCo 65	7/12/83	Notes	Weil		Handwritten notes of Weil re interview w/J. Fisher	22132	22161	11/7/83
CPCo 66	7/27/83	Notes	Weil		Handwritten notes by Weil re his interview w/Landsman	22136	22161	11/7/83
CPCo 67	7/14/83	Letter	Mooney for Schaub	Landsman	Letter re: progress schedule dated 7/14/82	22142	22161	11/7/83
CPCo 68	7/21/82	Letter	Schaub	Landsman	Letter re: progress schedule dated 7/21/82	22142	22161	11/7/83
CPCo 69	7/28/82	Letter	Schaub	Landsman	Letter re: progress schedule dated 7/28/82	22142	22161	11/7/83
CPCo 70		Report	Applicant		Report re: measures to protect Seismic I Utilities from freezwall activation	22149		11/7/83
CPCo 71	3/16/83	Notes	Weil		Handwritten notes of telephone conf. w/Harbour & Bechhoeffer	22151	22161	11/7/83

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED IN EVIDENCE AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
CPCo 72	7/13/83	Handwritten Notes	Weil		Weil's notes of NRC interview w/Hetzela	22379		11/8/83

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 1	12/4/78	Memo	Keeley/ T.C.Cooke	File	DGB settlement meeting	1516	1518	7/10/81
Stamiris 2	7/9/80	Audit Finding Report	Horn			1461	1463 3177 (Entered Twice)	7/9/81 8/5/81
Stamiris 3	7/11/81	NRC Staff Testimony (Gallagher)			QA Program Implementation Prior to 12/6/79	1770	2479	7/15/81
Stamiris 3 Attachment 1	9/29/78	Initial 50.50(e) Report	CPCo	Keppler	DGB settlement			
Stamiris 3 Attachment 2	11/17/78	I&E 78-12	NRC		DGB settlement, etc.			

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Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 3 Attachment 3	1/12/79	Summary of 12/4/78	Hood		Structural settlements			
Stamiris 3 Attachment 4	2/23/79	NPC Presentation of Prelim. Investigation Findings of DGB Settlement			DGB Settlement and Plant Area Fill			
Stamiris 3 Attachment 5	3/9/79	CPCo Discussion of NRC Inspection Facts resulting from DGB Investigation						
Stamiris 3 Attachment 6	3/21/79	50.54(f) Request	Denton	Howell	Plant Fill Inquiry			
Stamiris 3 Attachment 7	3/22/79	I&E 78-20			DGB settlement and adequacy of plant area fill			
Stamiris 3 Attachment 8	4/9/79	I&E 79-06			Soil boring program and plant area fill settlement monitoring			
Stamiris 3 Attachment 9	4/24/79	CPCo Response to 50.54(f) Question 1	CPCo	NRC	QA			

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Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 3 Attachment 10	6/6/79	I&E 79-10			Failure to properly translate PSAR design requirements into specs and procedures			
Stamiris 3 Attachment 11	8/10/79	Bechtel Review of US Testing Field & Lab Tests on Soils						
Stamiris 3 Attachment 12	10/1/79	I&E 79-19			Inadequate design control; inadequate QA personnel qualifications			
Stamiris 3 Attachment 13	10/16/79	Summary of 7/18/79 Meeting	Hood		Soil deficiencies			
Stamiris 3 Attachment 14	11/13/79	CPCo Response to 50.54(f) Question 23	CPCo	NRC	Supplement request for additional soils settlement information			
Stamiris 3 Attachment 15	12/6/79	Order	NRC	CPCo	Modifies Construction Permits			
Stamiris 3 Attachment 16	4/16/80	CPCo Answer to Notice of Hearing						

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Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 3 Attachment 17		Professional Qualifications of Gallagher						
Stamiris 4	5/26/81	Letter	Stamiris	Keppler	Attachments: (1) 11/26/73 "QA Deficiencies"; (2) 4/6/81 Intervenor's Answer Opposing CPCo Motion; (3) 7/9/80 "Planning Reports"; (4) 8/8/80 "Mgmt. Corrective Action Request."	2192	Wdwn: 2196	
Stamiris 5	8/13/69; 3/15/69	PSAR Amendment No. 3 (Dames & Moore Report)	CPCo; Dames & Moore	NRC; Bechtel	Dames & Moore Report Amendment: 2486 pp. 1, 9, 10, 11, and page entitled, "NRC Prelim. Finding 4."		To remain in ID form: 2524	
Stamiris 6	9/28/78	Meeting notes	Afifi		Settlements of structures south of the turbine building which are founded on fill	2532	2538	7/16/81
Stamiris 7	12/4/78	Bechtel Meeting Notes	B. Dhar		CPCo-NRC-Bechtel meeting re: DGB and other settlements.	2829	2831	8/4/81

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EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 8	11/1/78	Notes of 10/18/78 meeting	Dunnicliff	File (Soil & Rock Instr.)	Status - DGB Instrumentation	2874	Not in Evidence*	
Stamiris 8A		Map of DGB soil instr. locations			Attached to Stamiris 8	3436	Wdwn: 3923	
Stamiris 9	10/18/78	10/18/78 Meeting Notes	Marshall	File (Bechtel)	Site visit by John Dunnicliff	2875	Not in Evidence*	
Stamiris 10	11/6/78	Memo	Marshall	Afifi (Bechtel)	10/18/78 meeting and planned DGB surcharge instrumentation	2885	Not in Evidence*	
Stamiris 11	11/7/78	Letter	Howell	Keppler	Transmits interim 50.55(e) report on DGB settlement	2891	2892	8/4/81
Stamiris 12	8/11/80	MCARR	CPCo		Report No. HPL-1	2918	2924	8/4/81
	8/11/80	(Mgmt. Corrective Action Request/ Report)			re: Part 21 report on pipe whip restraints			

* Still open as of end of 8/4/81.

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EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 13	11/1/78	Letter	Martinez (Bechtel)	Keeley	Confirming 10/25/78 meeting re: continuation of work on DGB pending final decision on remedial measures	3254	3372	8/6/81
Stamiris 14	12/20/79	Memo	Beloff (Soil & Rock Instrumentation)	Afifi	Validity of Sondex readings	3255	3266	8/6/81
Stamiris 15	10/18/78	Letter	Peck	Afifi	Confirming 11/6/78 arrival in Urbana, and question re: reliability of brine-field subsidence data in PSAR	3286	3372	8/6/81
Stamiris 16	11/6/78	Handwritten Meeting Notes			Meeting in Champaign	3356	Not in Evidence	
Stamiris 17		Response to 50.54(f) Question 21	CPCo	NRC	DGB Preload	3405	3405	8/7/81
Stamiris 18	12/15/78	Memo	Peck	File	12/8/78 consultant meeting re: DGB surcharge program	3406	3429	8/7/81

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Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 19	9/29-30/77	Boring Log			Hole No. D at DGB	3437	4339	8/13/81
Stamiris 20	10/8/78	Meeting Notes (Early draft)	Afifi	File	10/8/78 Meeting with Hendron re: DGB	4008	4041	8/11/81
Stamiris 21	10/8/78	Meeting Notes (Final draft)	Afifi	File	10/8/78 Meeting with Hendron re: DGB	4008	Wdwn: 4030	
Stamiris 22	11/17/78	Letter	Hendron	Afifi	Summary of 11/7/78 Champaign meeting	4039	4057	8/11/81
Stamiris 23	11/16/78	Meeting Notes	Swanberg (Bechtel)	File	Bechtel/CPCo/Hendron meeting re: instrumentation and pre-loading	4039	4068	8/11/81
Stamiris 24	11/21/78	Memo	Peck	File	DGB settlement concerns	4039	4035	8/11/81
Stamiris 25	10/25/79	Meeting Notes			10/25/79 Ann Arbor meeting w/Bechtel, CPCo, Hendron, Gould	4039	4094	8/11/81
Stamiris 26	12/20/78	Memo	Peck	File	12/14/78 Meeting w/ Bechtel re: DGB settlement	4061	Not in Evidence*	

* Still open as of end of 8/11/81

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EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 27	9/29/77	Boring Log			Hold No. F at Evaporator and Aux. Boiler Building	4290	4339	8/13/81
Stamiris 28	1/8/81	Letter ("SALP Report")	Keppler	Cook	11/24/80, 12/2 and 12/17/80 memt. meetings: I&E 80-36/80-37 re: QA, control of Bechtel, timeliness of documentation	5352	5352	10/16/81
Stamiris 29	9/1/81	Internal Bechtel Report	Rutgers (Bechtel- Proj. Mgr.)	Cook	MCAR 24 - Final Report (DGB Settlement)	5353	5353	10/16/81
Stamiris 30	4/24/79	Graphs: (1) Option 1 -- Preloading of DGB soils; (2) dates of DGB surcharge application			Attachments B&E to Stamiris's 11/16/81 Request.	5896	5397**	12/1/81
Stamiris 31	1/8/82	Letter	J. G. Bloom Board		CPCo 1/7/82 News Release re: construction cost increases	7133	7135	2/2/82

** Clarification at Tr. 5977 (12/3/81)

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EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 32	2/5/82	Memo	Hood		Summary of 1/26/82 TC re: surcharge results for BWST foundations	7466	7485	2/17/82
Stamiris 33	1/15/82	Letter	NRC	Cook	Transmitting 1/8/82 geotechnical consultant's comments (HNS) on BWST foundation	7477	Not in Evidence	
Stamiris 34	10/20/80	Letter	Tedesco	Cook	Report for details of stress analyses for underground piping	7809	7822	2/18/82
Stamiris 35	10/16/80	Memo	Hood		Summary of 7/18/79 meeting on soil deficiencies	7827	7838	2/18/82
Stamiris 36	11/22/79	Report	Bechtel		Pipe Corrosion	9390	9392	11/18/82
Stamiris 37	1/26/81	Report	Bechtel		Pipe Corrosion	9390	9392	11/18/82
Stamiris 38	7/27/82	Trip Report	Bechtel		Pipe Corrosion	9390	9392	11/18/82
Stamiris 39	4/28/82	Letter	D. Miller	Davis	Confirm Stop Work	11592	11600	2/15/83
Stamiris 40	5/19/82	FSW-22	Bird		Stop Mergentime	11647	11649	2/15/83
Stamiris 41	5/19/82	Oral Com	Sevo		Stop Kelly	11715	11715	2/16/83

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Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 42	5/26/82	Letter and SCRE 51	Bird	Hughes	Drilling void	11741	11741	2/16/83
Stamiris 43	5/19/82	Activity Hold	Bechtel		Hold on OBS-4 and OBS-1A	11742	11743	2/16/83
Stamiris 44	2/3/83	List	CPCo		Pipes hit by drilling	11758	11759	2/16/83
Stamiris 45	12/23/80	Letter	Staff	Marshall	Dewatering Wells	13626	Not in evidence	
Stamiris 46	12/10/82	Draft Status Report	Burgess (NRC)	Shafer	Monthly Status Report through Construction Status	14492	14492	4/27/83
Stamiris 47	9/2/82	Letter	Warnick	CPCo	Noncompliance item 82-05-02 (a&b) still valid	14547	14547	4/28/83
Stamiris 48	12/15/82	Oral Communication	Wells		Wells and Shafer discussion of QA/QC organization plan	14547	14547	4/28/83
Stamiris 49	10/29/82	Memo	Warnick	Novak	Req Guide 1.29 Exceptions	14587	14587	4/28/83
Stamiris 50	3/4/83	IR 83-01	NRC		inspection of 1/11-14/83; Notice of Violation re: no documentation in weld fabrication problem	14645	14646	4/28/83

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Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 51	2/83	Report	Corley	CPCo	Site visit to evaluate crack reported 2/18/83 in roof of feedwater isolation valve pit	14643	Withdrawn: 14749	
Stamiris 52	2/3/83	Letter	S. Poulous (Geotechnical Engineering)	Kane	Electrical Penetration Area: plotting of data	14671	14749	4/28/83
Stamiris 53	12/9/82	CPCo memo	J. Cook		Regulatory Interface - CCP	14709	14749	4/28/83
Stamiris 54	2/14/83 Rev. 3/24/83	NRC	Rechtel		Drilling into SNP Duct Bank	14724	14749	4/28/83
Stamiris 55	5/4/82	SALP Rpt.	NRC		Period 7/1/80-6/30/81	14764	14806	4/29/83
Stamiris 56	5/17/82	CPCo Response to SALP	CPCo	NRC	SALP response	14781	14806	4/29/83
Stamiris 57		Handwritten notes	Shafer		Comments on CPCo SALP response	14781	14806	4/29/83
Stamiris 58		Typed copy of comments on SALP response	R. Cook		Comments on CPCo SALP response	14808	15983	5/5/83
Stamiris 59		Handwritten notes	[Landsman?]		6/21/83 SALP meeting	14834	14916	4/29/83

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Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 60	10/1/81	Memo (includes 9/22/81 memo)	Pirtle	Boyd	Supplemental SALP input from DETI.	14840	14916	4/29/83
Stamiris 61	8/6/82	Memo	R. Cook	Spessard	Extend SALP III period	14897	14916	4/29/83
Stamiris 62	4/1/83	Memo	Keppler	DeYoung (IE)	SALP: Zimmer and Midland	14906	14916	4/29/83
Stamiris 63	4/18/83	Memo	Keppler	Hind and Wareick	SALP: Zimmer and Midland	14910	14916	4/29/83

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Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 64	9/22/82	Memo (with 9/7/82 draft letter)	Hood		Summary of 9/8/82 meeting (Staff & Moneey) on soils related QA improvements	14964	Not in evidence	
Stamiris 65	9/24/82	Memo	Warnick	Keppler	Review of CPCo commitments by Midland Section	14990	15093	4/30/83
Stamiris 66	11/24/82	CPCo meeting notes	B. Peck		11/23/82 Meeting with NRC	15092	15092	4/30/83
Stamiris 67	7/82 to 3/83	Activity Log	Shafer		Chronology of Midland Section Activities, 7/82 to 3/83	15092	15092	4/30/83
Stamiris 68		Log (pp. 1-50)	Adensam		Handwritten notes re: GAP discovery request for BS	15720	Not in evidence but will "travel with the record." See Tr. 15732	5/4/83
Stamiris 69	9/10/82	Draft Letter	CPCo	NRC	Summarizing review discussions on soils remedial construction	15739	15741	5/4/83

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Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 70	9/10/82	Draft Letter	CPCo	NRC	Material in addition to that in Stamiris Exh. 69, re: Total QA implementation	15739	15741	5/4/83
Stamiris 71	Undated	Draft Letter	NRC (Keppler)	CPCo	Responding to two Sept. 17 letters from JWC (drafts of which are Stam. Exh. 69-70)	15741	15742	5/4/83
Stamiris 72		Notes (Comments)	NRR		Comments on Proposed letter from Keppler (Stam. Exh. 71).	15741	16333	5/6/83
Stamiris 73		Testimony Draft			Last page of draft of JGK's 10/29/82 testimony	15753	15755	5/4/83
Stamiris 74	12/21/82	Memo	Hernan (NRC)	Novak	12/7/82 meeting on Midland QA Implementation	15756	15756	5/4/83
Stamiris 75	9/7/82	Memo (w/o enclosures)	Hood		Summary of 8/17/82 meeting on soils-related construction release.	15756	15756	5/4/83
Stamiris 76	7/21/82	QAR F-189			IPINs indentifying deficiencies reinstallation of underpinning instrumentation; concern about repetitiveness of deficiencies.	15757	15757	5/4/83

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EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 77			G. Klinger (IE)		Midland Enforcement Package: general comments	15757	15758	5/4/83
Stamiris 78	8/18/82	QAR F-197			Quality indicator Graph for period 6/16-7/15/82 indicating potential adverse trend.	15950	Not in evidence	
Stamiris 79		Handwritten notes			Notes from 12/7/82 meeting	16006	Not in evidence	
Stamiris 80		Notes/Slide presentation			Goals of QC integration into MPQAD (from Bruggess' files - perhaps generated by Wells)	16608	Not in evidence	
Stamiris 81	12/3/82	Letter	Cook	Denton	Qualification of inspection, examination, and testing - audit personnel at Midland.	16620	16694	6/2/83
Stamiris 82	2/24/83	Oral Communication Record	Ewert		Performance demonstrations for inspector qualifications -- schedule changes.	16641	16655	6/2/83
Stamiris 83	8/19/82	Letter w/PQCI 7220	Bechtel	Turnbull	Soil Stabilization	16645	Not in evidence	

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Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 84	10/25/82	MPQAD Deviation Request No. 21	MPQAD		Procedures re QC certification	16648	16659	6/2/83
Stamiris 85	No Date	CPCo Handout			Indep. 3rd Party Reviews -- Indep. Design Verification -- Construction Implementation Overview -- Soils Remedial Activities. (Gardner's copy, with his notes).	16659	16679	6/2/83
Stamiris 86	No Date	CPCo handout to Caseload forecast panel			CCP Quality Activities, Reinspection Scope & Assumptions	16665	16679	6/2/83
Stamiris 87	12/82-12/83	Phone Log	B. David Reg. III			16716	Not in evidence	
Stamiris 88	10/2/81	Policy Smt.	Selby, Wahl	CPCo & Bechtel Employees	Midland Quality Policy Presentation by Selby & Wahl	16728	16730	6/2/83
Stamiris 89	5/24/83	Board Notification	Novak	ASLB	Hold Tag Violation during remedial underpinning construction	17040	17050	6/4/83
Stamiris 90	3/12/82	Letter	Hood		Summary of 3/10/82 meeting on QA in remedial foundation work	17187	17188	6/6/83

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Stamiris 91	10/4/82	Transmittal QAR F-197 (w/ Trend Graph)	Bechtel	CPCo	Note: Portion same as Stamiris 78	17188	17189	6/6/83
Stamiris 92	2/12/82-10/4/82	IPIN log			Shows IPINs upgraded to NCRS (Spring-Summer 1982, 19pp.)	17202	17202	6/7/83
Stamiris 93	11/22/82	Letter	Hood		Summary of 11/5/82 meeting on Independent Assessment of Underpinning at Aux. Bldg.	17225	17293	6/7/83
Stamiris 94		IR for Nine Mile Point			IR and NOV	17642	Not in evidence	
Stamiris 95	1/18/83	3 drafts and final cover letter	Reg. III	CPCo	Weil investigation into whether CPCo made misleading statements to NRC inspectors on 3/10 & 3/12.	17528	17529	6/8/83
Stamiris 96	5/82-6/82	Handwritten notes	Weil		Information from interviews with R. Black	17921	17921	6/10/83
Stamiris 97	11/19/82	Report to ACRS	Novak	Shewman		18157	18452	6/28/83
Stamiris 98	1/12/83		Bechtel		Engineering mark-up of CCP	18306	Withdrawn: 18455	

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Stamiris 99		Handwritten notes	B. Lee	D. Miller		18323	18457	6/28/83
Stamiris 100	7/29/82	Memo	Keeley		Bechtel Design Review. Note: 55 thru 4.4, plus conclusion is in evidence	18356	18512 (Portions)	6/29/83
Stamiris 100A	5/28/82	Memo	BPCo	Keeley	Midland IDV (proposed)		18604	6/29/83
Stamiris 101	5/27/83 (cover date)	Report	TERA		APW System	18359	18461	6/28/83
Stamiris 102	9/20- 9/29/82	Audit Report			Hydrostatic testing	18402	18461	6/28/83
Stamiris 103		QAR F-120				18866		
Stamiris 104	11/16/82	NCR			NCR #M01-5-22-166	18966	18967	7/1/83
Stamiris 105			BPCo		Procurement doc.; Certificate of Conformance	18991		

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Stamiris 105	1/10/80	Bechtel material receiving report	Delaney		Re Delaval Inc. replacement of anchor plates for exhaust silencer with attached QC inspection record			7/20/83
Stamiris 106	7/14/83	QAR	Johnson	Meisenheimer	S&W's concern re procedure PSPG-3.2 unclear	19218	19250	7/28/83
Stamiris 107	7/22/83	8304 #1	Cook	Keppler	Letter transmitting remedies for 50.55(e) re Fobb Interlock Relays Auxiliary Feedwater Sys	19228	19250	7/28/83
Stamiris 108	7/11/83	NCR MOI-9-3-170			During 6/27/83 QA inspector subcontractor's supervisory workers found not qualified	19232	19350	7/28/83
Stamiris 109	7/6/83	March Audit Report of Bechtel			Audit Report MOI-i9-3 w/att AFR OIF-13F IU	19238	19250	7/28/83
Stamiris 110	WITHDRAWN					19526	19530 19531 Withdrawn	
Stamiris 111	1/28/83	NCR FSO-038			28 IPINs on temp backfill	10707	19729	7/30/83

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EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 112	3/12/82	Remedial Soils weekly schedule Review Mtg with CPCo-Mergentime-Bechtel			Meeting notes re 3/12/82 meeting	19884	19891	8/1/83
Stamiris 113	undated	2 pages of handwritten notes	R. Black	Pam Glass	Handwritten notes re cable pulling, questions of Black to Glass	19953	19963	8/1/83
Stamiris 114	3/5/82	Remedial soils weekly schedule review meeting			Meeting notes re progress of remedial soils work underpinning	20016	20105	8/2/83
Stamiris 115	undated	Handwritten last page (4) of draft			Bechtel instrumentation engineers concerns re installation	20100	20105	8/2/83
Stamiris 116	7/11/83	NCR MOL-4-3-169 MPQAD			Deficient PQCI	20367	20399	8/3/83
Stamiris 117	6/26/83	S&W report 41	Lucks	NRC/Cook	Minutes of meeting on 6/27 through 7/1/83	20883	20399	8/3/83
Stamiris 118	8/29/80	CPCo memo of meeting	Sullivan		Memo of meeting re: CPCo-NRC management meeting on Schedule & Licensing			9/22/83
Stamiris 119	9/22/83	"Nuclear Future" Midland Daily News, pg. 14	Paul Rau		Interview w/Selby			id'd only

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Stamiris 120	7/13/83	Handwritten Notes	Weil's		Handwritten note re: meeting w/Horn	21528	21661	11/2/83
Stamiris 121	1/11/83	Handwritten Notes	Weil's		Handwritten notes re meeting w/Sibbeld	21532	21661	11/2/83
Stamiris 122	6/29/82	Guideline		Applicant	Administrative guideline c-11.0 to Revision Remedial Soils Work Permit System	21539	21662	11/2/83
Stamiris 123	6 to 8 of 1982	Log	Applicant		Remedial Soils Work Permit Log for 6 to 8 of 1982	21547	21662	11/2/83
Stamiris 124	3/5/82	Notes	Bechtel	CPCo Bechtel Mergentime	Meeting Notes; Remedial Soils Weekly Schedule Review Meeting	21617	21663	11/2/83
Stamiris 125	4/23/82	Notes	Bechtel	CPCo Bechtel Mergentime	Meeting Notes; Remedial Soils Weekly Schedule Review Meeting	21617	21663	11/2/83
Stamiris 126	5/14/82	Notes	Bechtel	CPCo Bechtel Mergentime	Meeting Notes; Remedial Soils Weekly Schedule Review Meeting	21621	21663	11/2/83
Stamiris 127	5/21/82	Notes	Bechtel	CPCo Bechtel Mergentime	Meeting Notes; Remedial Soils Weekly Schedule Review Meeting	21625	21663	11/2/83
Stamiris 128	10/21/83	Letter	Keppler	Cook	NRC Letter re: meeting on 10/11/83, enforcement conference <i>name</i> between NRC & CPCo	21657	21664	11/2/83

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EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 129	8/2/82	Record		by Wheeler to Schaub	Record of telephone call re: ASLB/NRC work authorization	21686	21689	11/3/83
Stamiris 130		Notes	Davis		Bert Davis' Notes	22012	not admitted but will travel w/ record	11/4/83
Stamiris 131	8/10/82	List	Applicant		List of subjects discussed w/NRC prior to enforcement meeting on 8/11/83	22071	22098	11/7/83
Stamiris 132	8/3/82	Notes			Notes of phone call between Wheeler & Landsman, 8/3/82	22076	22098	11/7/83
Stamiris 133	7/23/83	Schedule			Remedial Soils Weekly Schedule mtg. w/ attachments	22081	22098	11/7/83
Stamiris 134	7/27-7/30/82	Reports			Shift reports for 7/27-7/30/82	22095	22098	11/7/83
Stamiris 135		Statements	Office of Investigation		OI Policy Statements	22244	22333	11/8/83
Stamiris 136		Notes	J. Brunner		Handwritten notes of Brunner's interview w/Fisher	22269		11/8/83

Midland OM/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Stamiris 137		Notes	J. Brunner & Weil		Handwritten notes of Netzela interview by Brunner & Weil	22277		11/8/83
Stamiris 138	7/27/82	Notes	Weil		Weils notes of interview w/Schaub on 7/27 & 7/28/82	22391	22393	11/9/83
Stamiris 139	7/23/82	Report	Mergentime		Bechtel Daily Report re: deep Q pit #4 installation	22438		11/9/83
Stamiris 140	11/27/83	Court paper	CPCo	Stamiris	Applicants responses to Stamiris Interrogatories 14, 23, 31 and 19(a)	22658	22659	12/3/83
Stamiris 141	10/31/83	Memo	Keppler	Region III files	Meeting with Selby & Howell re: need for independent audit	22660	22663	12/3/83

Midland CR/OL Hearings

Exhibits

EXHIBIT	DATE OF DOCUMENT	DOCUMENT	FROM	TO	SUBJECT	IDENTIFIED AT TR.	IN EVIDENCE AT TR.	DATE IN EVIDENCE
Sinclair 1	11/16/81	Report: Draft	Singh	RHC	DGB & SWPS	10621	10625	12/8/82
Sinclair 2	4/5/83	Letter	Keppler	GAP	Stone & Webster, CCP	15529	15529	5/3/83
Sinclair 3	2/18/83	Memo	Shafer	Warnick	Stone & Webster	16116	16363	5/6/83
Sinclair 4					Page 6-1 of CPCC #33, S & W 90-day Report	16956	Not in evidence: See Tr. 18596-98.	
Sinclair 5	1/19/83	Summary	Hood			18488	18599	6/29/83
Sinclair 6		Handwritten notes	Wells		11/27/82 meeting; 4 pp.	18567	Not in evidence as of 7/1/83	
Sinclair 7	7/7/83	NRC MOI-5-3-223			Voided hanger redline drawings weren't pulled back	19261	19274	7/28/83
Sinclair 8	7/15/83	TERA report	Levin, Midland	Cook, Keppler, Eisenhut	Monthly Status Report #2 5/28/83 through 6/30/83	19363	19274	7/28/83

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USNRC

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION '84 JAN 31 11:21


BEFORE THE ATOMIC SAFETY AND LICENSING BOARD SECRETARY
DOCKETING & SERVICE
BRANCH

In the Matter of:) Docket Nos. 50-329 OM
) 50-330 OM
CONSUMERS POWER COMPANY) Docket Nos. 50-329 OL
(Midland Plant, Units 1 & 2)) 50-330 OL

CERTIFICATE OF SERVICE

I, Rebecca J. Lauer, one of the attorneys for Consumers Power Company, hereby certify that copies of the following documents were served upon all persons shown on the attached service list by deposit in the United States mail, first-class, postage prepaid, this 27th day of January, 1984:

1. Consumers Power Company's Proposed Second Supplemental Findings of Fact and Conclusions of Law for Partial Initial Decision on Quality Assurance Issues, including a Proposed Legal Opinion,
2. Cross-Reference to Consumers Power Company's Previously Filed Proposed Findings and Responses to Proposed Findings on Quality Assurance Issues, including a cover letter, and
3. cover letter to the Administrative Judges, dated January 27, 1984.


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DATED: January 27, 1984

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