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Nuclear Regulatory Commission

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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

In the Matter of)
)
HOUSTON LIGHTING & POWER) Docket Nos. 50-498 OL
COMPANY, *ET AL.*) 50-499 OL
)
(South Texas Project, Units 1)
and 2))

**APPLICANTS' PROPOSED FINDINGS OF
FACT AND CONCLUSIONS OF LAW
PHASE II**

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CITY OF AUSTIN, TEXAS

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OPINION

I. INTRODUCTION AND BACKGROUND

I.1. This is the second Partial Initial Decision involving the application for licenses to operate the South Texas Project, Units 1 and 2 (STP) filed in May 1978 by Houston Lighting & Power Company (HL&P), the City of San Antonio, Central Power and Light Company, and the City of Austin, Texas (hereinafter referred to collectively as the Applicants). HL&P is the lead applicant with responsibility for construction and operation of the facility. Much of the factual background of this proceeding is contained in our first Partial Initial Decision (Phase I PID), LBP-84-13, 19 NRC 659 (1984). We repeat only a summary here to explain the context of this Decision.

I.2. In Phase I two petitioners were admitted as parties: Citizens for Equitable Utilities, Inc. (CEU), and Citizens Concerned About Nuclear Power, Inc. (CCANP). In addition, the State of Texas was admitted as an interested State pursuant to 10 C.F.R. § 2.715(c). CEU subsequently withdrew from this proceeding on June 15, 1982, subject to certain conditions. See our Memorandum dated June 24, 1982 (unpublished). The State of Texas did not participate in the hearings which are the subject of this Partial Initial Decision.

I.3. The Phase I hearing commenced on May 12, 1981 and extended intermittently until June 17, 1982. On September 24, 1981, the Applicants informed us that they were replacing Brown & Root, Inc. (B&R) with Bechtel Power Corporation (Bechtel) in the roles of architect-engineer (A/E) and construction manager. Later we were advised that B&R had withdrawn as constructor. Ebasco Constructors, Inc. and Ebasco Services, Inc. (Ebasco) subsequently replaced B&R as constructor. On September 28, 1981, the Applicants transmitted to us a report on B&R engineering prepared for HL&P by the Quadrex Corporation (Quadrex). On November 21, 1981, CCANP filed a motion requesting admission of new contentions related to, among other things, the Quadrex Report. 1/ As a result, we divided the hearing into three phases in our Fourth Prehearing Conference Order, dated December 16, 1981 (unpublished) (hereinafter Fourth Prehearing Conference Order). Matters related to the Quadrex Report were designated for Phase II. Subsequently, the issues related to the Quadrex Report were refined and other Phase II issues were added.

I.4. As explained in detail below, particularly in Findings Section VI, the issues ultimately considered in Phase II were:

1/ "Citizens Concerned About Nuclear Power Motion To File Additional Contentions Based On New Information And To Establish A Discovery And Hearing Schedule With Respect To New Contentions" (hereinafter "CCANP Motion for New Quadrex Contentions").

(1) Contention 9, regarding HL&P's compliance with 10 C.F.R. § 50.55(e) with respect to the Quadrex Report. The scope of this contention was limited to 26 specific findings in the Report and the reportability of the Report as a whole.

(2) Contention 10, regarding HL&P's compliance with its obligations to inform the Board of the Quadrex Report and of the replacement of B&R. In the context of this contention, we inquired into the candor of certain HL&P testimony in Phase I as it might have related to the Quadrex Report or the pendency of a review of B&R engineering services.

(3) Issues relating to the current competence of HL&P and its contractors, including Issue B/D-1 pertaining to the adequacy of backfill placed by Ebasco, the adequacy of HL&P's current methodology for evaluating deficiencies for reportability pursuant to 10 C.F.R. § 50.55(e), and an update by the NRC Staff of its views concerning the current performance of HL&P and its contractors.

I.5. Our Decision resolves all of these issues and also determines whether any change is warranted in the favorable conclusions we reached in our Phase I PID regarding HL&P's character and competence.

I.6. This Decision is structured in the following fashion. The next four sections contain our Opinion on Contention 9 and related matters (Section II.), Contention 10 and related matters (Section III.), issues relating to the current competence of HL&P (Section IV.), and our overall conclusion

(Section V.). These are followed by our Findings of Fact on jurisdictional and procedural matters (Section VI.), HL&P's commissioning, handling and review of the Quadrex Report (Section VII.), the reportability of the Quadrex Report under 10 C.F.R. § 50.55(e) (Section VIII.), compliance with McGuire obligations and HL&P's candor (Section IX.), and the current competence of HL&P (Section X.). Finally, the Decision contains our Conclusions of Law and Order.

II. Contention 9

A. Introduction

II.1. In early 1981, shortly after Mr. Goldberg joined HL&P as its Vice President, Nuclear Engineering and Construction, the Company retained the Quadrex Corporation (Quadrex) to perform a review of B&R engineering focusing on aspects of the design known to be problems for the industry as a whole and certain matters proving especially difficult for B&R. The Quadrex review was an innovative step by HL&P. In 1981 it was not the practice in the industry for nuclear plant owners to conduct broad third party reviews of the work of their A/E's. Finding VII.2. The review extended over several months, during which time Quadrex provided periodic briefings to HL&P management on its progress and preliminary findings. HL&P management informed the NRC Project Manager for STP of the review and its schedule. Quadrex delivered a written report (the Quadrex Report or Report) of its findings to HL&P on May 7, 1981. At HL&P's direction B&R promptly reviewed the Report and provided advice on the application of 10 C.F.R. § 50.55(e) to certain of the findings, and provided a plan to resolve the findings. On May 8, HL&P's three most senior nuclear engineers reviewed the B&R advice as well as other information, and determined that there were three potentially reportable deficiencies under NRC regulations and promptly reported them to the NRC. Findings VII.2, 7-10, 19-20, 23-26, 35. At the time the Report was received the Phase I hearing

was about to begin. The hearings continued intermittently through the summer. In late September, HL&P transmitted the Report to the Board and the parties. Findings VII.53-56.

II.2. As formulated by the Board Contention 9 reads as follows:

9. The Applicants' failure to notify the NRC (Region IV) of the Quadrex Report, and of many findings beyond those actually reported, within 24 hours from the time HL&P became aware of the findings or prospective findings of the Report (including drafts), violates 10 C.F.R. § 50.55(e)(2) and reflects adversely on the character and competence of the Applicants and on their ability to manage the construction and operation of a nuclear power plant.

LBP-83-6, 21 NRC at 462-63.

The contention has several parts. It first questions Applicants' compliance with the requirements of 10 C.F.R. § 50.55(e). If Applicants did comply with those requirements there was no violation, and the contention is disposed of at the threshold. Even if there were a violation, however, we must consider further the questions of whether the violation reflects adversely on either the character or competence of Applicants. We address first the requirements of Section 50.55(e). Thereafter we review the manner in which HL&P handled its review of the Quadrex Report and how it informed the Staff about the Report and its findings. We then assess the application of Section 50.55(e) to the Quadrex Report as a whole and to the 26 findings of the Report which were identified in our prehearing orders as

the findings at issue in Phase II. Finally, we consider the implications of our findings on the question of whether we should reconsider our favorable preliminary judgment in Phase I regarding Applicants' character and competence.

B. Interpretation of 10 C.F.R. § 50.55(e)

II.3. The reporting requirement of 10 C.F.R. § 50.55(e), provides for notification of NRC of each deficiency found in design and construction, which, were it to have remained uncorrected, could have affected adversely the safety of operations of the nuclear power plant at any time throughout the expected lifetime of the plant, and which represents:

(i) A significant breakdown in any portion of the quality assurance program conducted in accordance with the requirements of Appendix B to this part; or

(ii) A significant deficiency in final design as approved and released for construction such that the design does not conform to the criteria and bases stated in the safety analysis report or construction permit; or

(iii) A significant deficiency in construction of or significant damage to a structure, system, or component which will require extensive evaluation, extensive redesign, or extensive repair to meet the criteria and bases stated in the safety analysis report or construction permit or to otherwise establish the adequacy of the structure, system, or component to perform its intended safety function; or

(iv) A significant deviation from performance specifications which will require extensive evaluation, extensive redesign, or extensive repair to establish the adequacy of a structure, system, or component to meet the criteria and bases stated in the safety

analysis report or construction permit or to otherwise establish the adequacy of the structure, system, or component to perform its intended safety function.

10 C.F.R. § 50.55(e)(1). The Section further calls for notification "of each reportable deficiency" to be provided to the appropriate NRC regional office (here, Region IV) within 24 hours, with follow-up written reports to be submitted within 30 days. 10 C.F.R. §§ 50.55(e)(2) and (3).

II.4. Reportability is determined by application of a three part test. First, a deficiency must be identified in either design or construction; second, the deficiency must have the potential, if left uncorrected, to affect adversely the safety of plant operations; and third, the deficiency must fall within one of the four categories of deficiencies spelled out in Subsections (e)(1)(i)-(iv) of the regulation, supra. To the extent the Quadrex Report indicates the existence of reportable deficiencies at STP, they are in design, not construction. That being the case, Subsections 50.55(e)(1)(iii) and (iv) are not applicable to the Quadrex Report, or this Decision.

II.5. Application of these criteria to the diverse and complex conditions that occur during the design and construction of a nuclear plant is often a difficult question requiring the application of engineering judgment, and there are frequently circumstances in which competent experts may reasonably reach inconsistent judgments about reportability. Thus, it has been recognized that Section 50.55(e) does "not provide precise

definitions for events that are reportable. . . ." Virginia Electric and Power Co. (North Anna Nuclear Power Station, Units 1 and 2), LBP-78-10, 7 NRC 295, 299, aff'd, ALAB-491, 8 NRC 245 (1978). Consequently, a licensee must exercise judgment in determining whether a matter is reportable. See North Anna, supra; Pacific Gas and Electric Co. (Diablo Canyon Nuclear Power Plant, Unit 1), DD-84-8, 19 NRC 924, 929 (1984).

II.6. CCANP contends that Section 50.55(e) is a "first impression" rule -- that as soon as HL&P heard the Quadrex findings or saw the Quadrex Report, it was obliged to notify the Staff of the findings or furnish the Report to the Staff within 24 hours. Apparently, CCANP's position is based on the fact that Subsection 50.55(e)(2) states that a licensee shall notify the NRC within 24 hours, while Subsection 50.55(e)(3) states that a licensee shall submit a written report to the NRC within thirty days. CCANP argues that while the latter allows time for detailed analysis, the former requires initial notification within 24 hours based on a "first impression." We disagree and find no support for this position. Both Subsections 2 and 3 use the term "reportable deficiency", in both instances clearly referring to those deficiencies which meet the criteria set forth in Subsection 50.55(e)(1). Thus, the rule itself does not distinguish between the types of matters which must be reported to the NRC within thirty days, and those of which the NRC must be notified within 24 hours. Neither Subsection triggers a reporting requirement until it is established that there is, in fact, a

reportable deficiency as that term is defined in Subsection 50.55(e)(1). ^{1/} In order to make such a determination, the licensee must perform an evaluation of the significance of the problem. Section 50.55(e) does not place specific limits on the time that may be taken to conduct that evaluation, although a reasonable time limit is implied, (Virginia Electric Power Co. (North Anna Nuclear Plant, Units 1 and 2), LBP-78-10, 7 NRC 295, 299, 302, aff'd, ALAB-491, 8 NRC 245 (1978)) and, in fact, this principle is embedded in NRC guidance. See ¶ II.7.

II.7. Moreover, there is a sound practical reason to reject CCANP's "first impression" theory. During the course of construction of a typical nuclear power plant, tens of thousands of nonconformance reports, audit findings and other types of deficiency reports are generated. If CCANP's "first impression" interpretation were the law, and if even only a fraction of these "appear" to be significant "on first impression", the NRC Staff would be inundated with Section 50.55(e) reports, the preponderance of which would be found, upon evaluation, not to deal with reportable matters. The Staff prefers that a licensee exercise judgment and screen the matters being reported to the NRC in order to avoid flooding it with information that may later prove to have no safety significance (Tr. 15062-65 (Johnson,

^{1/} As discussed below, if a licensee determines that a deficiency exists and is not fully able to determine its significance within a reasonable evaluation period, under the NRC guidance a licensee would notify the NRC of the deficiency. See ¶ II-7. However, this is quite different from CCANP's "first impression" theory, which allows no time for evaluation, or at most, 24 hours.

Constable, Heishman)) and this is reflected in the NRC's "Guidance -10 C.F.R. 50.55(e), Construction Deficiency Reporting" (hereinafter "I&E Guidance"). Staff Exh. 137. That document provides for notification to the NRC of deficiencies that are "potentially reportable." According to the I&E Guidance,

[a] potentially reportable deficiency is considered to exist when: (1) an initial [sic] prompt review of available information indicates that the problem could be significant (i.e. - partial significance is established) but, for various reasons, additional time is required to complete the evaluation; and (2) the deficiency may be considered significant, but neither a prompt review or [sic] full evaluation can be completed within 14 days due to lack of specific information.

Staff Exh. 137 at 6-7. Thus, the I&E Guidance recognizes a reasonable period (e.g. 14 days) for evaluating the significance of deficiencies to determine whether to report them as reportable or "potentially reportable". Furthermore, the I&E Guidance recognizes that a licensee must exercise judgment in determining whether a matter is reportable. Staff Exh. 137 at 8; Heishman, ff. Tr. 14846, at 2. 2/

2/ CCANP's "first impression" theory is not equivalent to the Staff's "potentially reportable" guidance. As noted above, the I&E Guidance recognizes that evaluation may be necessary even to determine if an item is "potentially reportable". The "potentially reportable" category was created solely to encourage prompt reporting, and licensees are not required to notify NRC of "potentially reportable" deficiencies that are not otherwise reportable under Section 50.55(e). Thus, if an item is not reportable under Section 50.55(e), a licensee could not be cited for a violation for having failed to notify the NRC of a "potentially reportable" deficiency. Tr. 14989-94, 15024-25 (Taylor, Johnson).

II.8. We should emphasize that recognition of a reasonable time to evaluate deficiencies does not denigrate the importance of the 24-hour notification requirement. We recognize that early notification is an important ingredient of the overall inspection and enforcement framework. However, as noted by NRC Staff witnesses, the requirement is not intended to result in flooding the NRC with unevaluated items as to which there is yet no supported basis for a belief that a "reportable deficiency" (as defined in the regulations) may exist.

II.9. Although we reject CCANP's "first impression" argument or theory as a basis for interpreting the reportability requirements of 10 C.F.R. § 50.55(e), our differences with CCANP are of little significance to our instant Decision because, in any event, Applicants completed their evaluation of the reportability of the Quadrex findings in little more than twenty-four hours after receipt of the Report (May 7-8, 1981).

C. HL&P Review and Reporting of Quadrex Report

II.10. Prior to completion of the Quadrex Report there were three briefings of HL&P management in which Quadrex described its observations regarding B&R design. Some of these observations were similar to or the same as the eventual findings in the Report. HL&P understood the Quadrex briefings to be the preliminary views of Quadrex, subject to further study and confirmation. Findings VII.7-13, 16-18. Furthermore, these briefings did not explain the basis for Quadrex's views. Id.

Consequently, HL&P did not have sufficient information to conduct a reportability review and it believed that the only orderly way to determine if there were reportable deficiencies was to await receipt of a written report from Quadrex. Findings VII.9-11, 17-18. HL&P's decision to wait until Quadrex completed its review and presented its Report was reasonable, particularly in the current circumstances, where the Report was scheduled to be completed promptly and waiting for it did not occasion significant delay in performing the review. See Findings 9-11, 17-20. The NRC Staff investigated HL&P's handling of the Quadrex Report in 1982 and found no basis for criticizing HL&P on this score. 3/ Findings VII.44. Neither does the Board.

II.11. Recognizing that there might be reportable deficiencies identified in the Quadrex Report, HL&P wrote to B&R on May 6, directing it to perform an immediate reportability review upon receipt of the Report the following day. On May 7, Quadrex submitted its Report and briefed B&R and HL&P on the findings it believed required a reportability review. B&R, on instructions from HL&P, undertook and completed its review during the balance of that day. The B&R reviewers were the lead discipline engineers who were most familiar with the status and basis of the design. Because HL&P utilized the results of the

3/ Although the Staff determined that HL&P should have reported earlier two of the items reported on May 8, 1981, such determination was based on information available to HL&P prior to the Quadrex review not on information received during briefings from Quadrex. See Finding VII.46. The Staff did not find that these items provided support for CCANP's allegations of "conspiracy," and neither do we.

B&R review in its review of the Report. HL&P's review benefitted from the collective knowledge of the B&R engineering organization. Findings VII.19, 20, 23, 29. Even though HL&P could have relied on the review by its contractor, HL&P decided to undertake a separate independent review using a team of its three most senior nuclear engineers: Mr. Goldberg (Vice President, Nuclear Engineering and Construction), Mr. Cloin G. Robertson (Manager, Nuclear Licensing) and Dr. James R. Sumpter (Manager, Nuclear Services). The HL&P review team had the benefit of Dr. Sumpter's detailed involvement in the Quadrex review and his long association with the Project. Dr. Sumpter and Mr. Robertson had participated in a B&R review meeting on May 7, at which the B&R engineering discipline leaders presented to B&R management their conclusions on the reportability of the Quadrex findings. The combined experience of Mr. Goldberg, Mr. Robertson and Dr. Sumpter reflected a breadth of expertise that encompassed the technical areas addressed by Quadrex. Findings VII.23-27. The Board finds that the HL&P review of the Report on May 7-8 was performed by professionally competent personnel.

II.12. The Quadrex Report contains "discipline findings," each of which are divided into categories called "most serious," "serious" and so on, and "generic findings" which are divided into the first two categories. HL&P's reportability review, including the B&R review, focused on the discipline findings Quadrex categorized as "most serious". In so focusing its review, HL&P relied on the advice of Quadrex that of the

discipline findings only the "most serious" related to matters of licensing significance and that although certain findings in this category were clearly not reportable, anything of a reportable nature would be found in this category. Finding VII.28, 30-32. Accordingly, it was reasonable for HL&P to review only the "most serious" findings for reportability.

II.13. The Quadrex Report states that the generic findings are based upon the discipline findings. Quadrex confirmed this fact during its briefings of HL&P and further stated that a review of the most serious discipline findings would likely identify anything that was reportable. Accordingly, HL&P's team, although it was sensitive to the possible generic implications of the discipline findings, did not specifically review the generic findings for reportability on May 8, 1981. Findings VII.33-34. The Board was initially concerned that, by focusing on the most serious discipline findings, HL&P may have been overlooking indications of a significant breakdown in the QA program. As we discuss in ¶ II.22, 28, that did not turn out to be the case. In any event, HL&P's decision to concentrate its effort on the most serious discipline findings was reasonable because of Quadrex's advice and because HL&P's review team was sensitive to the synergistic effects of the discipline findings and clearly competent to reach its own judgment regarding their broader implications. Findings VII.37-41.

II.14. It was HL&P's regular practice to refer questions of reportability under Section 50.55(e) to an Incident Review Committee (IRC) composed of staff level engineers. The HL&P reportability review of the Quadrex Report was, however, conducted by a special team of its most experienced nuclear engineers because analysis of the Report required an in-depth understanding of nuclear engineering and the processes of designing a nuclear plant. Findings VII.25-27. HL&P's review process reflects careful attention to reporting responsibilities, and demonstrates the type of management involvement that NRC encourages. The Board finds HL&P's reportability review process was a proper and conscientious effort to fulfill its obligations under Section 50.55(e) and that it reflects very favorably on its character and competence.

II.15. B&R advised HL&P that Quadrex identified one reportable deficiency, related to heating, ventilation and air conditioning (HVAC) system design. The HL&P review team determined that two additional potentially reportable deficiencies were reflected in the Report, one related to verification of computer codes and the other related to safety classification of shielding calculations. Findings VII.35. HL&P believed these latter two matters might reflect significant breakdowns in the QA program. HL&P promptly notified NRC of these three items. HL&P's decision to report two items despite the advice of B&R that they were not reportable reflects its very conservative reporting policy and is an example of aggressive

management involvement, a substantial change from our earlier concerns in Phase I regarding abdication of responsibility to its A/E.

II.16. Although the most persuasive evidence of the competence and integrity of HL&P's review process is that we have determined that none of the 26 Quadrex findings that were at issue in this proceeding were reportable (see Section II.D), additional support is found in the results of reviews that were conducted by Bechtel and the Staff prior to the Phase II hearings. In early 1982 a Bechtel Task Force considered the reportability of each of the discipline findings. Bechtel did not find any additional items to be potentially reportable except one related to an instrument air line design, which HL&P promptly reported to the NRC. Soon thereafter, however, the item was determined not to be reportable. Finding VII.36. The NRC Staff considered the reportability of the Quadrex Report as a whole and of its findings, including the generic findings, and published its conclusions in an inspection report in late 1982 as NUREG-0948. Finding VIII.169. In August 1984, in response to a request from this Board for the Staff to explain the bases for the reportability conclusions in NUREG-0948, the NRC Staff again reviewed the reportability of the Quadrex discipline findings. Finding VIII.170. Neither Staff review identified any additional reportable matters. Finding VIII.169-170.

II.17. The fact that a Bechtel review and two Staff reviews reached the same reportability determinations as did HL&P in 1981, is highly indicative of the fact that HL&P's 1981 review was both competent and conducted in good faith. 4/

II.18. HL&P's oral and written reports regarding the three potentially reportable deficiencies did not allude to the Quadrex Report. Section 50.55(e) does not require that deficiency reports include a description of how the deficiencies were discovered. It was not regular HL&P policy to include such information in its reports. Therefore, the fact that such information was not provided in the three reports associated with the Quadrex findings was not unusual. Finding VII.47.

II.19. HL&P recognized the desirability of keeping the NRC Staff informed of the third party assessment of engineering, without regard to the requirements of law or regulations. On three separate occasions during the Quadrex review, Mr. Goldberg contacted the NRC Project Manager, Mr. Sells and advised him first of the initiation of the Quadrex review, then of the fact that some potentially reportable deficiencies were expected to be identified, and finally of the receipt of the Report, offering to brief him on the results. Findings VII.2, 14, 49. Mr. Goldberg also advised Mr. Sells that the NRC could review the Report at

4/ Although the Staff is reconsidering its 1984 interpretation of Subsection 50.55(e)(1)(i) in light of our criticisms in LBP-85-6 (21 NRC at 455-56), the fact that it reached that conclusion indicates that others could reach the same result in good faith. To avoid any confusion, we should also note that HL&P applied an appropriate interpretation of that Subsection. See ¶ II.13; Finding VII.37.

HL&P's offices. Mr. Goldberg testified that he did not file the Report with the NRC because there was no regulatory requirement to do so. It was not HL&P's practice to file consultant's reports, and he was concerned that if the Report was released to the public it could be misread or mischaracterized. Findings VII.49, 53-55. The briefing of Mr. Sells took place during the week of the Phase I hearing in Bay City, Texas, a few days after receipt of the Report. Mr. Goldberg described the nature and number of the findings, stated that HL&P intended to resolve them, and mentioned the three reportable deficiencies which had been reported to Region IV. Although CCANP contends the briefing of Mr. Sells was part of an effort to deter NRC from seeking the Report, CCANP offered no pertinent evidence; Mr. Sells clearly did not share that view, and the record is barren of anything to support that notion. Findings VII.49, 55. To the contrary, we find that the contacts with Mr. Sells, including the briefing, demonstrate HL&P's intent to be open and candid with the NRC Staff about the Quadrex Report.

II.20. In August 1981, NRC Region IV personnel requested and were given access to the Report, again with the understanding that its review would take place on Project premises. In requesting that the Report stay on its premises HL&P was treating the Quadrex Report in the same manner as it and other licensees treat other consultant reports. The Report was distributed within HL&P and B&R and was widely discussed on the Project. Findings VII.53, 55. It was also discussed with co-

owners at Project Management Committee meetings, (CCANP Exhs. 108-114) and, as we have seen, with the NRC Project Manager. Finding VII.49. HL&P did not treat the Report with unusual secrecy nor was it stamped "confidential". In any event, there was nothing improper in HL&P's handling of the Report, in view of its determination that it need not be furnished to the Staff pursuant to 10 C.F.R. § 50.55(e). There is nothing to suggest that HL&P at any time resisted any Staff request for access to the Report. To the contrary, HL&P was fully cooperative and even volunteered to brief the Region IV officials on it. Furthermore, HL&P believed, not unreasonably, that by keeping Mr. Sells informed regarding the Quadrex review, and by informing Region IV of the potentially reportable items, it satisfied its reporting obligations and duty of candor to the Staff. In retrospect, Region IV expressed some disappointment that HL&P did not advise the Region of the Report at the same time it advised Mr. Sells. However, the Region recognized that, in 1981, the NRC's policy with respect to reports not required by NRC regulation was unclear and it would have been reasonable for a licensee to believe that NRC's NRR office was the appropriate arm of the NRC to address design issues. Findings VII.49-51, 53, 55-56, 58. The NRC Staff found nothing in these facts to suggest improper behavior, and neither do we.

II.21. In summary we find there was no basis for the filing of any Section 50.55(e) reports by HL&P before it received and reviewed the Quadrex Report; the review process it employed

was proper and effective, and its results are supported by the results of subsequent reviews conducted by Bechtel and the NRC Staff; and HL&P voluntarily kept the NRC Staff informed of the review and its results, even in the absence of any regulatory requirement to do so. We find nothing in HL&P's review and handling of the Quadrex Report that would reflect adversely in any way on its character or competence.

D. Application of Section 50.55(e) to the Quadrex Report

II.22. Applicants presented two of the three members of the HL&P review team (Mr. Goldberg and Dr. Sumpster), who made the initial HL&P decisions in 1981 on reportability, and the third member (Mr. Robertson) appeared upon subpoena by CCANP. These three witnesses clearly demonstrated that they had considered the possibility of significant QA breakdowns in their review. Finding VII.37-38. Applicants also presented Dr. Bernsen and Mr. F. Lopez of Bechtel, who testified that none of the 26 discipline and generic findings in controversy represented a significant QA breakdown. Finding VIII.171. Finally, the NRC Staff presented Mr. Taylor who also reviewed those 26 findings in light of this Board's interpretation of Section 50.55(e) cited in our February 26, 1985 Memorandum and Order (LBP-85-6, 10 NRC 447) and found no significant QA breakdown. Finding VIII.172.

II.23. With minor differences, the testimony is in accord with the results reached by the HL&P review team on May 8, 1981. None of the witnesses disagreed with HL&P's decision not to

notify the NRC of the Report as a whole or any of the generic findings pursuant to 10 C.F.R. § 50.55(e). Similarly, with the exception of the three matters discussed in ¶ II.27, none of the witnesses were of the opinion that NRC should have been notified of any matter in the discipline findings other than those actually reported by HL&P. Even in the case of the three exceptions, the information in the record confirms that HL&P need not have reported these matters on May 8, 1981.

II.24. In view of our previous concern that the Staff had inappropriately intertwined the requirements of Subsections 50.55(e)(1)(i) and 50.55(e)(1)(ii), we carefully reviewed the testimony to assure that the expert witnesses based their judgment on the interpretation of Section 50.55(e) contained in our February 26, 1985 Order (LBP-85-6, 21 NRC at 455). We are satisfied that they have done so and thus that each of them gave appropriate consideration to the question of whether the Report revealed any significant QA breakdowns other than those reported by HL&P on May 8, 1981.

II.25. A close reading of the ten Quadrex generic findings at issue reveals that, for the most part, they do not allege that the STP design was unsafe or that the B&R design process did not satisfy regulatory requirements. Instead, they focus on the efficiency of the design process. See generally, Findings VIII.80-158. Moreover, the Quadrex generic findings do not draw conclusions about the adequacy of B&R's engineering effort. Instead, they identified some common threads that

appeared in the discipline findings, thus suggesting areas into which HL&P might inquire to determine whether improvements in the design process were desirable. Findings VII.33 and VIII.78. A thorough review of the bases cited by the Quadrex Report as support for the generic findings confirms that these findings do not identify a significant breakdown in the QA program. Based on this record, the Board concludes that none of the Quadrex generic findings was reportable under 10 C.F.R. § 50.55(e)(1)(i).

II.26. All evidence regarding the 16 discipline findings at issue establishes that they were not reportable. Many of the discipline findings dealt not with technical errors, but rather design activities which B&R had not yet performed (See Findings VIII.11, 25, 40, 62, 65, 69) or which was not being done by methods deemed preferable by Quadrex (See Findings VIII.20, 29, 43, 53). Matters of this type are generally not reportable under 10 C.F.R. § 50.55(e) because they are not deficiencies in design or QA and do not violate regulatory requirements. Of the discipline findings that did not fall into the foregoing two categories, three related to design features that had not been released for construction. Findings VIII.16, 47, 49. Another finding incorrectly stated that the analysis of heat transfer in the Essential Cooling Pond had not considered simultaneous shut-down of both units. Findings VIII.31-33. Still another finding suggested reconsideration of a design feature (filtration of a building exhaust vent), but did not assert that it was inadequate -- and it proved to be adequate. Findings VIII.55-56.

Finally, one of the findings, related to the safety classification of radiological shielding calculations, was initially reported by HL&P as a potentially reportable item. Subsequent review, however, revealed that B&R's treatment of shielding calculations was in accordance with industry practice and the NRC was advised that the matter was not reportable. Finding VIII.58-59. The Board finds that none of these 16 Discipline findings was reportable.

II.27. Although the Staff witness testified that he would have judged three matters in the Quadrex discipline findings, or portions thereof, to be "potentially reportable," he emphasized that they were close calls based on judgment as to which there could be differences, that his evaluations were based solely on the Quadrex Report and that HL&P might have had more information (which we in fact found to be the case), and that HL&P's contrary judgments did not reflect adversely on HL&P's character and competence. On the basis of testimony from Applicants' witnesses we were convinced that these matters were not in fact potentially reportable. Findings VIII.8-11, 35-37, 45-47, 172. Even if we had determined otherwise, however, we agree with Mr. Taylor that these close judgment calls cannot reflect adversely on HL&P's character or competence.

II.28. With respect to the reportability of the entire Report pursuant to Section 50.55(e), the only basis on which that regulation might require submission of a consultant report, such as the Quadrex Report, is if the Report taken as a whole,

indicated the existence of an overall breakdown in the QA program and there is no evidence to that effect. To the contrary, every witness who addressed this question (and there were many) expressed the view that, other than the items reported, the Report did not indicate a significant breakdown in any portion of the QA program for STP. Findings VIII.161-163. Based upon the record and our review of the Report, the Board finds that the Quadrex Report as a whole was not reportable under 10 C.F.R. § 50.55(e).

II.29. In summary, the record in this proceeding confirmed the correctness of HL&P's reporting decisions pursuant to Section 50.55(e) with respect to the Quadrex Report in 1981.

E. Implications Regarding Applicants Character and Competence

II.30. Even if we were to determine that Applicants had violated a reporting obligation under Section 50.55(e), however, that would not be the end of our inquiry. In the context of the issues before us, the Board would additionally have to determine whether "a violation, if it occurred, reflects a deficiency in the character or competence of HL&P to complete and/or operate the South Texas facility." LBP-85-6, 21 NRC at 458.

II.31. As to "character," in an earlier Order, we had stated as a general proposition that where the NRC Staff agreed with a licensee that reporting was not required, even if we were to disagree on reportability, the failure to have reported would

not reflect adversely on the licensee's character. Memorandum and Order, dated July 10, 1984 (unpublished), at 8; see also LBP-85-6, 21 NRC at 458. The fact that a licensee and the NRC Staff reached the same reportability conclusions -- even if we found them to be in error -- would strongly indicate that the difference in judgment is due to the acknowledged vagueness in Section 50.55(e) rather than any improper motivation on the part of the licensee. The broad concurrence of the Staff and the licensee on the reportability questions associated with the Quadrex Report is essentially dispositive of any serious question relating to "character."

II.32. As we previously acknowledged, however, it is possible that "any particular failure to report was motivated by character deficiencies." LBP-85-6, 21 NRC at 458. Although it is most unlikely in circumstances where -- as here -- the Staff has found there was no failure to report, we would need to explore whether such character deficiencies exist. Among the factors we believe to be pertinent are:

- (1) Whether any violation of Section 50.55(e) was flagrant and unmistakable or whether the licensee could reasonably have believed that a report was not required.
- (2) Whether the violation was part of a pattern of conduct or whether it was an isolated instance.
- (3) Whether the officials of the licensee appeared to be acting in bad faith or discharging their responsibilities under Section 50.55(e) in a forthright manner.

Accordingly, those are the questions we would have taken into account in deciding whether any failure to report under Section 50.55(e) would affect our previous favorable determination as to HL&P's character.

II.33. In the case of each finding at issue, and the Report as a whole, there has been credible and persuasive testimony from well qualified experts that the findings were not reportable. The Board's review of the Quadrex findings and the Report as a whole convinced us that there were no additional reportable matters that were not reported by HL&P on May 8, 1981. Thus, even if another reviewer were to reach a different judgment on one or more of the Quadrex findings -- or even on the Report as a whole -- the conclusion is inescapable that HL&P officials reasonably believed that no further reports were required and that any failure to report by HL&P was not a flagrant or unmistakable violation of Section 50.55(e).

II.34. Our review of Applicants' undertaking of the Quadrex review, its handling of the Quadrex Report including its communications with the NRC Staff and its review process and reporting of deficiencies did not identify the slightest evidence of a pattern of conduct suggesting an unwillingness by the Applicants to comply with 10 C.F.R. § 50.55(e) or otherwise provide pertinent information to the NRC Staff. To the contrary, notwithstanding the lack of a clear Staff policy concerning such consultant's reports (Johnson and Constable, ff. Tr. 14846, at 9-10) and the absence of any regulatory requirement, HL&P

informed the Staff of the review and of the Report and made it available to the Staff. Although we have found no violation of Section 50.55(e), if another reviewer were to find any in the face of this record they would have to be isolated instances. Moreover, in view of the repeated Staff testimony in both Phase I and Phase II that the Applicants were candid and open, fully satisfied Section 50.55(e) obligations and tended to report more items than were required (LBP-84-13, 19 NRC at 683-84; Findings X.17-18), we are convinced that any isolated violations found by others should not reflect adversely on Applicants' character.

II.35. Finally, we have carefully reviewed the record to ascertain whether any evidence existed that HL&P officials had been acting in bad faith in their handling and review of the Quadrex Report or in their relationships with the Staff concerning the Report. We are convinced that Applicants used a responsible review process, made appropriate reportability determinations, manifested a clear disposition to fulfill faithfully their reporting obligations and acted openly and candidly with the Staff. We were also impressed by the uniformity of the testimony of the Staff witnesses, none of whom had any criticisms of the Applicants' reportability decisions or dealings with the Staff concerning the Report and none of whom thought that the review or handling of the Report reflected adversely on HL&P's character or competence. We are thus convinced that there is no evidence that HL&P acted in bad faith at any time.

II.36. Our overall conclusion regarding HL&P's character, in light of its commissioning and handling of the Quadrex review and Report, and its reporting of Section 50.55(e) deficiencies, is a favorable one, and is supported by a large number of factors. In addition to our consideration of HL&P's reporting we also note that Mr. Goldberg's prompt commissioning of the review immediately upon joining HL&P reflects his appreciation of the need to become knowledgeable of, and take responsibility for, the engineering work at STP. The focus of the review on known problem areas reflects HL&P's sincere desire to identify areas requiring improvement. Furthermore, once the review began, HL&P permitted Quadrex to conduct "its own" evaluation, and refrained from imposing its opinions on the review, even though it did not completely agree with Quadrex's preliminary conclusions. We also note that even before receipt of the Report, B&R was directed to promptly prepare a plan to resolve all of the Quadrex findings and to issue any stop work orders deemed necessary. Findings VII.6, 19.

II.37. In short, HL&P's commissioning and handling of the Quadrex review, its efforts to keep the Staff informed regarding the review, and its reporting of deficiencies demonstrates that it possesses the requisite character to be granted operating licenses for the STP.

II.38. With respect to "competence," in light of the many changes in personnel and procedures of HL&P and its principal contractors since early 1981, any past reporting deficiencies

are of little significance. But Applicants' present competence is important and, accordingly, we required HL&P to provide testimony concerning its current methodology for evaluating Section 50.55(e) deficiencies, including the experience and competence of the persons charged with that responsibility, along with any changes since 1981. LBP-85-6, 21 NRC at 460. We deal with this subject in Section IV below.

II.39. Although we focus on HL&P's present competence, we have considered HL&P's conduct in commissioning and handling the Quadrex Report, and in conducting its reportability review, and find it reflects favorably on its prior competence. Mr. Goldberg's recognition of the need to obtain a prompt assessment of the status of engineering work on the Project, HL&P's conduct during the review, its development of an efficient and effective process for evaluating the reportability of the extensive number of findings in the Report, its management attention to the reportability review and the accuracy of its determinations all reflect the operation of a competent and well-qualified licensee. In short, while we have examined and ruled upon HL&P's current competence (in Section IV) we also conclude our review of the record indicates that HL&P's competence in 1981, as reflected in its Quadrex reporting decisions, was entirely consistent with the standards expected of applicants for licenses to operate nuclear facilities.

III. CONTENTION 10 AND HL&P's CANDOR

A. Introduction

III.1. Contention 10 states that the Quadrex Report was relevant and material to issues of character and competence addressed in Phase I and should have been furnished to the Board and the parties shortly after its receipt by HL&P, and that HL&P's failure to do so reflects adversely on its character and competence. In our Sixth Prehearing Conference Order, dated May 17, 1985 at 3-4 (unpublished) (hereinafter Sixth Prehearing Conference Order), in denying CCANP's Motion to Reopen the Phase I Record, we ruled that Contention 10 is broad enough to encompass consideration of the timing of HL&P's notification to the Board of the consideration of replacement of B&R. We address both of these issues in this Section. In addition, in LBP-85-6, 21 NRC at 460, we discussed CCANP's claim that HL&P's actions in reporting of the Quadrex Report reflected adversely on its character and competence. We requested HL&P to explain at the hearing any inconsistency of the Quadrex Report with Phase I testimony of HL&P witnesses concerning their perception of the adequacy of B&R's services, and their reasoning for not mentioning the Quadrex Report or the review of B&R's engineering services during that testimony. Since these questions also relate directly to HL&P's candor with this Board, this Section also addresses those matters.

III.2. Under the McGuire decision and related precedents, ^{1/} parties to NRC proceedings "must inform the presiding board and other parties of new information which is relevant and material to the matters being adjudicated." Duke Power Co. (William B. McGuire Nuclear Station, Units 1 and 2), ALAB-143, 6 AEC 623, 625 (1973). The purpose of the McGuire reporting requirement is to ensure that NRC adjudicatory boards have complete and current information regarding the issues before them, and to avoid boards "passing upon evidence which . . . [does] not accurately reflect existing facts." Id. at 625-26. In cases of "reasonable doubt" as to the relevance and materiality of information, such information "should be disclosed for the board to decide its true worth." Three Mile Island, 19 NRC at 1358. However, the Appeal Board has also recognized that "the mere existence of a question or discussion about the possible materiality of information" does not "necessarily" make the information material (Midland, 16 NRC at 914), and has cited the Commission's guidance in Virginia Electric and Power Co. (North Anna Power Station, Units 1 and 2), CLI-76-22, 4 NRC 480, 487-88, 491 (1976), that in determining materiality, one should "use common sense and consider the context and stage of the licensing process in which the materiality issue arises." Midland, 16 NRC at 914.

^{1/} E.g., Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit 1), ALAB-774, 19 NRC 1350 (1984); Consumers Power Co. (Midland Plant, Units 1 and 2), ALAB-691, 16 NRC 897 (1982); Georgia Power Co. (Alvin W. Vogtle Nuclear Plant, Units 1 and 2), ALAB-291, 2 NRC 404 (1975).

III.3. We had previously concurred with the position taken by both the NRC Staff and CCANP "that the Quadrex Report was relevant and material to matters before the Board and, as a matter of law, should have been turned over under the McGuire doctrine shortly after its receipt by HL&P." LBP-85-6, 21 NRC at 461-62. Both relevance and materiality are, however, dependent upon the facts, and our previous determination was made without the benefit of testimony explaining the substance and import of the Quadrex Report. Our holding was predicated upon our view that design QA was the subject of the Report, and that "construction and design QA are not so disparate as to be considered unrelated subjects." Id. at 462. Since we have now received extensive evidence on the import of the Quadrex Report, we believe it only appropriate to revisit our prior conclusion.

B. McGuire Obligation With Respect to the Quadrex Report

III.4. Our ruling that the Quadrex Report was relevant and material to matters before this Board in Phase I was based on our perception of the Report as focusing on design QA, i.e., that it contained findings dealing significantly with compliance with the QA program for design of STP. LBP-85-6, 21 NRC at 461-62. The record shows that this initial perception of the Report was one that others shared, including senior NRC Staff management. Finding IX.9. Upper level HL&P management was also initially concerned that the Report appeared to indicate that the B&R

design was seriously deficient. Finding VII.21. However, we are inclined to reconsider this ruling, because the record directly and clearly challenges this shared initial reaction.

III.5. The impression that the Quadrex findings were indicative of significant QA deficiencies is created, in large measure, by the many findings criticizing the design process and citing the absence of specified mechanisms to implement the design work. The Quadrex generic findings, in particular, create the initial impression that the Report deals with QA deficiencies, but, as the evidence adduced at the hearing shows, these findings did not purport to identify observed deficiencies in the design process, but rather suggested areas for further investigation. Finding VII.33. As we discuss in detail in our Findings, the purpose of the Quadrex review was not to determine B&R's compliance with Appendix B. The Quadrex Report did not generally identify QA problems, (i.e., deficiencies in the quality of either the engineering products or the engineering processes), but instead, described what Quadrex viewed as inefficiencies in the B&R design process that could result in increased costs and low productivity. Findings VII.21-22, IX.6-10. Neither the findings nor their supporting data provided any basis to conclude that there was a significant QA breakdown, except with respect to those matters reported by HL&P to the Staff. Copies of the written reports on those items were sent to the Board and the parties. Findings VII.38, XI.6-10. Thus, while our initial impression of the Report was that the findings were the result of

a substantial number of QA deficiencies and hence, was clearly related to the QA/QC issues in Phase I, this proved not to be the case. The evidence makes clear that the focus of the Report was on questions of efficiency, schedule and the adequacy of B&R engineering resources, not compliance with QA requirements. Id. As a result, it is now not apparent to the Board that Applicants violated any McGuire obligation by not furnishing the Quadrex Report to the Board and the parties in May or June 1981.

III.6. Even if we were to adhere to our initial view that the Report was subject to the McGuire doctrine, because it related to the limited discussions of engineering in the Phase I hearings, we would look, as we did in the case of Applicants' Section 50.55(e) reporting, to questions of whether there was a deliberate breach of an unmistakable duty, a pattern of conduct to that effect, or any indications of bad faith. See ¶ II.32.

III.7. We are convinced that the obligation to provide the Report was not a clear and unmistakable duty. The record is most persuasive that it was not unreasonable for Applicants to believe that the Quadrex Report did not contain information that was relevant and material to the Issues in Phase I. Findings IX.5-10, 12-14. At worst, as the Staff has recognized, the question was "close" (Finding IX.12.), and no evidence indicates that the Applicants can be faulted severely for any McGuire violation.

III.8. We turn next to the question of whether Applicants' failure to furnish the Quadrex Report to the Board and the parties is part of a pattern of such conduct. The Board has had an ample opportunity to observe the conduct of HL&P over the course of many years. We have found the Applicants to be extremely open and candid with the Board and the parties. We have received copies of virtually all of Applicants' correspondence with the Staff, including written Section 50.55(e) reports and responses to notices of violation, and have received numerous other correspondence regarding the Project. Throughout this long period, no question has been raised about Applicants' candor. At issue in Phase II was whether Applicants' dealings with the Board on the Quadrex Report, and the decision to replace B&R (discussed in ¶¶ III.10-15), suggest a departure from this pattern of candor. In particular, we focus on two basic questions -- was the Quadrex Report material to the Phase I issues, and at what point should HL&P have advised the Board of its consideration of replacing B&R. We do not perceive this issue, regardless of how we resolve the substantive questions, as suggesting a pattern of withholding information from the Board. To the contrary, these are isolated instances in a history of candor and openness with this Board.

III.9. As to whether officials of HL&P were acting in good faith in not providing the Report to the Board and the parties, we are convinced that Mr. Goldberg (who decided not to provide the Report), and other HL&P officials, reasonably

believed that the Report was not relevant and material to the issues in Phase I. Findings IX.35-48. Clearly, Mr. Goldberg was reluctant to make the Report public and decided not to file it with the NRC Staff or the Board in the absence of a duty to do so. Findings VII.53-54. However, we cannot read into this determination any intent to breach a duty which he believed existed, and we have found no evidence that he or any other responsible HL&P official believed there to be such a duty. To us, their good faith was clear.

C. McGuire Obligation With Respect to the Replacement of B&R

III.10. As to the replacement of B&R, Applicants advised the Board on September 24, 1981, that it was reallocating the responsibility of A/E and Construction Manager from B&R to Bechtel and had requested that B&R stay on the Project as constructor. Letter, J.R. Newman to Members of the Board, dated September 24, 1981. As a result of this, the hearing schedule was altered, the issues were revised, and the Phase I hearing was ultimately completed in June 1982. In the concluding session of Phase I we heard testimony from Applicants explaining the reasons for their decision to terminate B&R. We were particularly interested in the timing of that decision and its relationship to the testimony that had been presented to the Board during May and June 1981. Mr. Goldberg testified in June 1982 that HL&P had decided on June 29, 1981, to find out whether there were any feasible alternatives to keeping B&R as the A/E. He also

testified that prior to that decision he had suggested exploration of alternatives from time to time, but that HL&P was unwilling to do so until every reasonable avenue of improving B&R's performance had been exhausted. Tr. 10518-20 (Goldberg); see 19 NRC at 781. Mr. Goldberg described HL&P's efforts during the Spring of 1981, working with B&R, to improve B&R's capability to complete the Project design. Tr. 10413-17 (Goldberg). He also referred to a meeting on June 26 in which information received about the state of the Project lead to HL&P's decision to explore alternatives to B&R. Tr. 10572-73 (Goldberg). The Board then considered this testimony to have adequately resolved our questions regarding the candor of HL&P's testimony earlier in the proceeding.

III.11. In a motion to reopen the Phase I record, 2/ CCANP charged that counsel for HL&P had "manipulated" the timing of the replacement decision for some improper purpose. CCANP also charged that HL&P's former Executive Vice President, Mr. Oprea, gave misleading testimony in Phase I regarding the Company's deliberations regarding removal of B&R. In view of CCANP's serious charges, we ruled that Contention 10 was broad enough to encompass not only the reportability of the Quadrex Report, but also the replacement of B&R. The Applicants presented the testimony of Messrs. Jordan, Oprea and Goldberg, the principal management officials involved in this matter. CCANP subpoenaed, as an adverse witness, the Chairman of the STP

2/ CCANP Motion to Reopen Phase I Record, dated April 15, 1985.

Owners' Management Committee, Mr. Jesse Poston, an employee of the City Public Service Board of San Antonio, one of HL&P's co-Applicants. In addition, CCANP offered numerous exhibits, including the minutes of various Management Committee meetings.

III.12. All of this evidence, to the extent it was relevant, confirmed the accuracy of the testimony in Phase I. HL&P first decided to determine if there were alternatives to B&R on June 29, 1981. Upon finding that such alternatives existed, HL&P conducted an intensive effort to select a replacement contractor and negotiate an agreement. This process culminated in an agreement in principle with Bechtel on September 23, and the notification to the Board on September 24. Findings IX.20-30. There was no evidence of any effort to influence or avoid influencing this Board by manipulation of the timing of the decision or of the announcement of the decision. Finding IX.32. Neither was there any evidence that the testimony of Mr. Oprea in Phase I, which CCANP attacked, was in any way misleading. Findings IX.24-26.

III.13. The question posed by CCANP's charge is whether, at some point prior to September 24, the decision to reallocate responsibilities or to consider such reallocation had become so clearly set that it was incumbent upon HL&P to notify the Board. Based on this record we cannot fault the timing of the announcement. Clearly, the June 29 decision had no direct effect on any matter of interest to the NRC since it did not alter the Project and, as we find, was predicated on considera-

tions of cost and schedule, not matters within NRC's province. Nor was it germane to any of the issues heard during the Phase I hearing in the summer of 1981. Until an agreement in principle was reached between HL&P and Bechtel, replacement of B&R was only a possibility, requiring complex management decisions and commercial negotiations. The Board would not expect to be informed of such a matter until it had been decided with reasonable certainty. Compare Midland, 16 NRC at 912. Accordingly, there was no violation of the Applicants' McGuire obligations in this regard and most certainly no flagrant violation or breach of an unmistakable duty.

III.14. Finally, we note that the record clearly reflects that HL&P recognized the need to advise the Board promptly upon their making a decision to replace B&R. Finding IX.32. There is no evidence in the record that any HL&P official acted other than in good faith.

III.15. Accordingly, the Board finds that the timing of HL&P's notification to this Board of the decision to replace B&R does not reflect adversely on HL&P's character or competence.

D. Candor of HL&P 1981 Testimony

III.16. In LBP-85-6, 21 NRC at 460, we requested HL&P to address (1) the apparent inconsistency of the Quadrex Report with testimony presented by HL&P during the spring and summer of 1981 concerning the adequacy of B&R's services, and (2) the fact that HL&P witnesses did not mention the Quadrex Report or a far-

reaching review of B&R's design engineering services in response to questions where a reference to these topics might have been appropriate.

III.17. We particularly directed the Applicants' attention to specific portions of testimony where these topics could have arisen. In response to our request, four HL&P witnesses who testified in Phase I (Messrs. Jordan, Goldberg, Oprea and Frazar) each explained why they did not address these topics in their 1981 testimony. We find their explanations satisfactory. These witnesses understood the 1981 hearings to be dealing with construction and construction-related QA issues. The Quadrex Report and other concerns about the ability of B&R engineering to support the Project focused primarily on cost and schedule concerns, not QA or safety issues, and thus, in their view, were not germane to the issues in the Phase I hearing. These witnesses testified that, with the improvements made in response to the Show Cause Order, the quality of B&R's construction performance in 1981 was satisfactory and that HL&P desired to retain B&R as constructor for STP. Given these facts, the general nature of the hearings did not require mention of the Quadrex Report or other concerns about B&R engineering performance. Findings IX.35-37, 39-40, 42-43, 45-46.

III.18. These witnesses also satisfactorily explained why these topics were not discussed in response to the particular questions from the Board and the parties in Phase I. Based on a careful examination of the context and focus of the questions and

answers in these portions of testimony, we find that HL&P's witnesses were truthful and candid and that reference to these matters was not essential to their answers. Findings IX.38, 41, 44, 47.

III.19. Finally, to the extent CCANP alleges any conspiracy to withhold from this Board or the NRC Staff information about the Quadrex Report or other concerns with B&R engineering, we find no basis for this allegation in the record. Findings VII.46-47, 49-50, 52-55, 58-59; IX.23, 32, 48.

E. Conclusions Regarding HL&P's Candor With The Board

III.20. NRC Staff witnesses in Phase I repeatedly testified that Applicants have been particularly open and candid with the NRC Staff. LBP-84-13, 19 NRC at 683, 739-40, 741, 767-68, 773. We have found nothing in the Phase II testimony to change this conclusion. The Staff's testimony with regard to HL&P's handling of the Quadrex report indicates no deviation from the Applicants' forthright relationship with the Staff. Johnson and Constable, ff. Tr. 14846, at 10-11; Taylor, ff. Tr. 14846, at 54; Phillips (50.55(e)), ff. Tr. 15116, at 3-4. On reviewing this record, the Board finds that Applicants have been equally truthful and candid with the Board. We find no evidence regarding HL&P's testimony or notifications to this Board that reflects adversely on HL&P's character or competence.

IV. CURRENT COMPETENCE OF HL&P

A. Introduction

IV.1. In the Phase II hearings, we addressed three matters related to the current competence of HL&P and its contractors. First, in light of the questions raised regarding HL&P's application of 10 C.F.R. § 50.55(e) to the Quadrex Report, we decided to consider HL&P's competence in light of its current methodology for evaluating 10 C.F.R. § 50.55(e) deficiencies. Sixth Prehearing Conference Order at 8. Second, in our Phase I PID we found that "subject to the supplementation of the record in Phase II, HL&P has taken remedial steps which appear sufficient to provide reasonable assurance that it has the managerial competence and character to operate STP safely." LBP-84-13, 19 NRC at 781. To obtain this supplementation we required the Staff to provide a report concerning the performance of HL&P, Bechtel and Ebasco at STP since the close of the Phase I record. Id. at 697. In accordance with our directions (Tr. 10739-40; see also Fifth Prehearing Conference Order dated November 16, 1984, at 3-4 (unpublished) (hereinafter Fifth Prehearing Conference Order)), the Staff provided a report in affidavit form, and the other parties responded. As described further below, based on these filings we decided to hear an issue concerning the adequacy of backfill placed by Ebasco (Issue B/D-1). See Finding X.19. Third, although our review of the Staff affidavit and the responses of the parties identified the adequacy of backfill as

the only specific issue to be heard, we requested the Staff to present evidence at the hearing updating its report on the performance of HL&P, Bechtel and Ebasco at STP. Sixth Prehearing Conference Order at 9.

B. HL&P's Current Section 50.55(e) Reporting Program

IV.2. In assessing the adequacy of HL&P's current Section 50.55(e) reporting program (including the extent to which it meets applicable requirements and reflects applicable Staff guidance), we examined the mechanisms currently in place for identifying potentially significant deficiencies, evaluating those deficiencies against the criteria of Section 50.55(e), and reporting those deficiencies meeting the reporting criteria to the NRC. We considered not only the adequacy of the written procedures in place, but also the qualifications and competence of those individuals charged with primary responsibility for deficiency evaluation and reporting and the "actual operation" of those procedures. We also evaluated HL&P's current method for trending QA deficiencies to ascertain whether appropriate mechanisms are in place to assure that the broader ramifications of individual deficiencies are appropriately considered for reportability. Finally, we considered changes incorporated in HL&P's current program since 1981.

IV.3. HL&P's reporting program is implemented through several procedures requiring HL&P, Bechtel and Ebasco employees to promptly bring to the attention of appropriate supervisory personnel conditions which may represent significant deficiencies

within the meaning of Section 50.55(e). Such conditions receive prompt engineering evaluation and are forwarded to an Incident Review Committee (IRC) for evaluation of their reportability. Findings X.4, 5. Even conditions determined not to justify IRC review are evaluated periodically by the IRC or by HL&P Licensing and Engineering personnel to assure that reportable matters are identified. Findings X.4, 11.

IV.4. The permanent members of the IRC have the requisite experience and qualifications to conduct reportability reviews. Finding X.6. Furthermore, additional engineering personnel with specific expertise or knowledge in the areas being evaluated serve on the committee on a case by case basis (Finding X.7), and the Manager, Nuclear Licensing, Mr. Wisenburg, reviews and concurs with the IRC's determinations (Finding X.8). We found Mr. Wisenburg to be an able and qualified individual. Finding X.2.

IV.5. HL&P's program provides for the timely reporting of reportable and potentially reportable items to the NRC. Finding X.8. There have been no deficiencies identified in the HL&P reporting system since 1983, and deficiency evaluations have been performed in accordance with Staff guidelines regarding timeliness. Finding X.18.

IV.6. While its 1981 reporting procedures met applicable requirements, HL&P has implemented a number of improvements since that time. Findings X.16, 17. The revised trending program, in particular, appears to be comprehensive and provides

an appropriate mechanism to identify significant breakdowns in the QA program that cause deficiencies which, when considered individually, would not be reportable. Findings X.15, 18.

IV.7. In short, HL&P properly understands and applies the reporting requirements of Section 50.55(e) and has a satisfactory reporting program carried out by competent individuals in a manner consistent with applicable requirements. Based on our findings, we conclude that the reporting program provides assurance that HL&P will continue to meet its obligations under Section 50.55(e) in the future, and that HL&P's record of compliance with 10 C.F.R. § 50.55(e) reflects positively on its competence to be granted operating licenses for the STP.

C. Issue B/D-1-Adequacy of Backfill Placed by Ebasco

IV.8. Issue B/D-1 inquires whether there is reasonable assurance that the backfill placed at STP by Ebasco meets applicable requirements in light of two "violations" related to Category I backfill activities on the Project, and two findings of an HL&P audit of those activities. It also requires us to assess HL&P's competence in light of those matters.

IV.9. Most of the Category I backfill for the STP, including virtually all of the backfill supporting Category I buildings, was placed by B&R, and only a small amount of backfilling remains to be done. Since Ebasco assumed the role of constructor in 1982, it has placed backfill only in limited areas, primarily around piping, ducts and other miscellaneous

facilities. Finding X.24. In Notice of Violation 83-24-02, the Staff cited HL&P for failure to comply with a specification that required the use of a funnel pouring device for testing the minimum density of the fill material. Instead of using a funnel, the contractor was using a scoop pouring device, which may result in lower minimum density measurements and, correspondingly, a higher "relative density" calculation. Findings X.25, 27.

IV.10. In response to the Notice of Violation, HL&P took a number of corrective actions to address the specific violation, as well as to evaluate, in a more comprehensive fashion, the overall adequacy of STP Category I backfill activities. Finding X.26. HL&P's corrective actions were thorough and comprehensive, including correction of the testing practices, remedial measures to prevent the occurrence of similar errors and a comprehensive audit of backfill related construction activities to assure compliance with all Project commitments and regulatory requirements. Findings X.26, 36.

IV.11. Analysis of the backfill accepted on the basis of tests done using the scoop showed that it is adequate to perform its intended function. In fact, the actual minimum density of the fill may be even lower than the values obtained through use of the scoop (thereby resulting in even higher actual relative densities). Finding X.28. Thus, the relative density of the backfill is acceptable. Moreover, additional conservative analyses were performed to estimate the test results that would have been obtained if a funnel had been used. Although these

estimates indicated that some of the test results would have fallen below the Project acceptance criteria, both the Applicants' and the Staff's witnesses concurred that, even based on such conservative estimates, the STP Category I backfill placed during the period in which the scoop was utilized is more than adequate to perform its structural function. Findings X.29, 30.

IV.12. The second "violation" addressed in Issue B/D-1 was not, in fact, a violation, but Unresolved Item 83-24-01 in the NRC Inspection Report. The NRC inspector noted a concern regarding the Ebasco written procedure for inspection of backfill placement, which required only daily monitoring of backfill placement activities. However, Ebasco had been inspecting virtually every significant lift, and the procedure was changed to more closely reflect Ebasco's actual practices. The Staff found this corrective action satisfactory and closed the unresolved item. There is no question as to the adequacy of the backfill resulting from this item. Finding X.32.

IV.13. Finally, the two HL&P audit findings addressed by Issue B/D-1 reflected HL&P QA's concerns that: (1) contrary to the FSAR and specification, Ebasco's inspection procedure did not provide sufficient guidance to QC Inspectors regarding in-place density testing depths to ensure that representative in-place density information for depth intervals within each lift was being obtained; (2) the inspection procedure did not require test depths to be recorded; and (3) test depth information was not being provided by Ebasco to the testing agency for inclusion in

test reports. Findings X.33, 34. In response to the audit findings it was determined that the requirement to obtain representative in-place density information for depth intervals within individual lifts was unnecessarily conservative. The requirement was deleted from the FSAR and the specification. Id. The applicable specification and procedure were, in any event, modified to require records of test depths, and the specification was modified to require Ebasco to provide test depth information to the testing contractor. Finding X.34. These audit findings did not raise any concern about the adequacy of the backfill.

IV.14. In short, the uncontroverted testimony of both the Applicants and Staff demonstrated, and we find, that Category I backfill placed by Ebasco to date is adequate to perform its structural function and conforms with applicable requirements, and that reasonable assurance exists that future backfill activities will be conducted in an acceptable manner. Although deficiencies were identified in the backfill testing and inspection program at STP, HL&P's corrective actions were comprehensive and adequately addressed the technical and QA program aspects of these deficiencies. HL&P's corrective actions reflect affirmatively on its competence. Findings X.35, 36.

D. Performance of HL&P, Bechtel and Ebasco Since Phase I

IV.15. In response to our request for a report on the performance of HL&P, Bechtel and Ebasco since the close of the record in Phase I, the Staff filed an affidavit on December 21,

1984 (corrected on January 24, 1985), that reviewed NRC's oversight of STP since the reallocation of contractor responsibilities to Bechtel and Ebasco, and the Staff's observations and findings. The Staff stated that the Bechtel and Ebasco QA programs at STP are adequate. It also concluded that HL&P displayed excellent involvement in both transition and restart activities, that HL&P has been progressively more aggressive in dealing with quality-related issues since then, and that HL&P's involvement in construction and quality aspects of the Project, at both management and staff levels, had increased since the transition. Finding X.37.

IV.16. Although the responses of the parties to the Staff affidavit did not raise any specific material issues (Finding X.39), we requested that the Staff update its views at the Phase II hearing. Sixth Prehearing Conference Order at 9. The Staff witnesses testifying in response to this request included the Region IV managers directly responsible for NRC's inspection of STP and four present and former NRC resident reactor inspectors at STP who have held these functions since Phase I. Finding X.42.

IV.17. These Staff witnesses uniformly expressed the view that HL&P and its contractors have performed competently and presently have the competence that the NRC requires. They cited satisfactory performance early in the period, with marked improvement thereafter, and stated that the improvement was indicative of a high degree of management involvement in site

activities. Findings X.43, 44. The Staff witnesses did not identify any weaknesses in the performance of HL&P or its contractors. Instead, the Staff testified that, in the three areas in which the Staff had seen room for improvement in the SALP report for the one year period ending November 30, 1983, (i.e., soils and foundations, corrective action and reporting, and material control), HL&P had shown significant improvement and, indeed, had improved in virtually all areas of its construction performance. Finding X.45.

E. Conclusions Regarding the Competence of HL&P and its Contractors

IV.18. The record on the current competence of HL&P, Bechtel and Ebasco is clear and unambiguous. Since the transfer of responsibilities in 1981-82, HL&P and its contractors have been properly fulfilling their reporting responsibilities under 10 C.F.R. § 50.55(e). Every project has experienced some deficiencies in construction performance, and STP has been no exception, but HL&P has reacted promptly and aggressively to correct identified deficiencies, identify their causes, and take action to prevent recurrence of similar deficiencies. HL&P's actions to correct the soils testing methods, analyze the adequacy of the backfill, audit for compliance with Project backfilling requirements, and prevent occurrence of similar procedural deficiencies in other areas is ample demonstration of HL&P's aggressiveness in correcting deficiencies. Accordingly, the findings in our Phase I PID need no longer be considered

preliminary. The Board finds that Applicants and their contractors have the necessary competence to provide reasonable assurance that the STP will be completed and operated in accordance with applicable NRC requirements.

V. CONCLUSION

V.1. In our Phase I PID, we concluded that "we perceive this project as one which, although in trouble at an earlier date, has now likely 'turned the corner.'" LBP-84-13, 19 NRC at 721. We based our view on changes effectuated by HL&P which "should result in upgraded QA/QC performance at STP." Id. at 721-22. We noted, however, that since the record did not include much information on Project performance with the referenced changes, our assessment could only be preliminary, but that the information we would receive in Phase II "will likely make clear whether our preliminary expectations in fact prove realistic." Id. at 722.

V.2. We have now concluded that our expectations were realistic and have been fulfilled. HL&P has been aggressive and thorough in resolving problems and implementing prompt and thorough corrective action. It has added key management and supervisory personnel with extensive experience. HL&P management has been effectively and increasingly involved in all site activities. The satisfactory overall regulatory performance of HL&P has continued to improve. The uncontroverted record in the Phase II proceeding demonstrates both the current competence of HL&P and its principal contractors and the current operation of a successful QA/QC program during the construction of STP.

V.3. In addition, in our Phase I PID we found that we had "reasonable assurance that HL&P has sufficient character for the Applicants to be granted operating licenses," but noted that our determination was subject to the outcome of the hearings on the Quadrex Report. LBP-84-13, 19 NRC at 691. After an exhaustive review of HL&P's commissioning, handling and reportability review of the Report, its related dealings with the Staff, its notifications of the Board as to both the Report and the replacement of B&R, and the previous testimony of Applicants' witnesses that might relate to these subjects, we have found nothing that would adversely affect our favorable determination as to HL&P's character. Instead we have found further support for our previous determination. HL&P has continued to be open and candid with the NRC Staff, its witnesses continue to impress us with their truthfulness and candor, and the Staff's witnesses continue to uniformly agree that HL&P complies with its reporting obligations and otherwise fully cooperates with the Staff.

V.4. CCANP, of course, does not share this favorable view of HL&P's competence and character. The thrust of its position was perhaps best reflected in its opening statement. Tr. 11281-312. CCANP's chief argument is that HL&P engaged in a conspiracy to withhold the Quadrex Report from the NRC, including this Board, (Tr. 11286-99) and in even a broader conspiracy -- one that encompassed events relating to eventual replacement of B&R -- to withhold from this Board information as to problems relating to B&R's engineering performance (Tr. 11306-11).

Although we have carefully searched the record, we have found no evidence of any conspiracy. CCANP's theory is based entirely on speculation, and, with respect to each allegation, we have found Applicants' response to be supported by the record and credible.

V.5. The linchpin of CCANP's theory is that the Quadrex Report contained many reportable items and, in fact, should have been reported as a whole; and that Mr. Goldberg's decision to report only three items was intended to "help cover him later." Tr. 11286. To the contrary, as we have found (see Section II; Findings Sections VII and VIII), HL&P's reportability review was careful, and its decisions were sound; their correctness was confirmed both by testimony at the hearing and the results of other reviews.

V.6. CCANP apparently also charges that the conspiracy included withholding information about the Quadrex Report from the NRC Staff; it claims that the briefing of the NRC Project Manager was "nothing more than the actions of hiding the real substance of Quadrex" and tries to make much of the minor difference in recollection between Mr. Goldberg and Mr. Sells as to whether the Quadrex Report was available during the briefing. Tr. 11288-89. However, the record -- including the NRC's investigation of CCANP's conspiracy allegations (see Staff Exh. 140) -- shows that not only was there no conspiracy to withhold the Report from the NRC but that, even in the absence of any regulatory requirement to do so, HL&P kept the NRC Staff informed of the review. Mr. Goldberg notified Mr. Sells of the initiation

of the review, informed him near its completion that it would likely contain some items reportable under 10 CFR § 50.55(e), offered to brief him when it became available and made clear that the Report was available for NRC review. See ¶ II.19.; Findings VII.2, 14, 49. Moreover, the Report was readily made available to Region IV in response to a general inquiry during an unrelated NRC investigation, and a briefing was later volunteered to the Region. Findings VII.55-56. Thus, we view HL&P's contacts with the NRC Staff concerning the Report as commendable, and CCANP's allegations concerning minor differences in the recollections of Mr. Sells and Mr. Goldberg do not lead us to a contrary view.

V.7. CCANP next claims that not providing the Quadrex Report to this Board and not mentioning it in testimony of HL&P officials were each part of the "continuing conspiracy." Tr. 11289-99. As we have previously explained (see Section III.B.), on the basis of our more detailed understanding of the Report we now believe that the question of whether HL&P did not violate its McGuire obligations is a close one and we are inclined to reconsider our previous ruling. Even if a McGuire violation did occur, however, we are convinced it was not part of any "conspiracy." CCANP's claim hinges upon its mistaken view that the Report "certainly related to quality assurance" and demonstrated "a major breakdown in the quality assurance program," i.e., "a major breakdown in the quality of the design and engineering process being conducted by Brown & Root." Tr. 11289-90. But, to the contrary, the record shows neither any unreported "major"

breakdown in QA nor any flagrant violation of McGuire obligations, and the testimony convinces us that HL&P officials did not act in bad faith in not providing the Report. Section III.B.; Findings Section IX.A.

V.8. Similarly we have found no hint of conspiracy in the fact that HL&P officials did not mention the Report in response to questions during Phase I. We have thoroughly reviewed their explanations as to why the Report was not mentioned and found them to be forthright and persuasive. Section III.D.; Findings Section IX.C.

V.9. As to the alleged "broader" conspiracy (Tr. 11310-11), CCANP claims that HL&P officials willfully refused to mention that they were seriously considering removing B&R when they testified in June of 1981 (Tr. 11306-08) and that they improperly failed to inform the Board of steps being taken to "find someone to replace Brown & Root as architect engineer" after June 29, 1981 (Tr. 11308-10). According to CCANP, HL&P was motivated by a concern that if we found out "how bad things are at this project" we would have a different view of HL&P's and B&R's competence and the Project would be terminated. Tr. 11310-11. We find below that CCANP is wrong on all counts.

V.10. HL&P was not seriously considering terminating B&R when its officials testified in May and June of 1981. In fact, the record reflects that HL&P was devoting its efforts to upgrading B&R's engineering performance. ¶ III.10.; Finding IX.21. Although Mr. Goldberg was urging HL&P's upper management

-- as a matter of caution -- to ascertain whether alternatives were available, even this step was not initiated until June 29, 1981. While CCANP focuses on some testimony given before the Texas PUC and argues that it appears inconsistent with this explanation, we are satisfied on the basis of all of the testimony that there were no serious discussions concerning removal of B&R prior to June 29, 1981. ¶ III.10; Finding IX.22. Moreover, we are fully satisfied with the explanations of HL&P officials as to why they did not express in more detail their concerns regarding B&R's engineering performance in their Phase I testimony. ¶ III.18; Finding IX.48.

V.11. As to the alleged failure to inform this Board concerning the steps taken after June 29, 1981, not only do we find that this was not a violation of any obligations under McGuire, but we agree with the testimony of the Applicants that there was no information that could have meaningfully and reasonably been provided to us before September 24, 1981. ¶ III.14.; Finding IX.34.

V.12. Thus, CCANP has failed to convince us of the validity of any of its individual claims relating either to the narrow or to the "broader" conspiracy, let alone that CCANP's claims collectively demonstrate that any conspiracy took place. On the contrary, our searching examination of all of these matters has reinforced our favorable opinion as to both the integrity of the involved HL&P officials and their openness and candor with the Staff and this Board.

V.13. We have reviewed with great care the entire record of this proceeding, including the proposed findings of fact and conclusions of law submitted by the various parties. Based on the foregoing Opinion, the Findings and Conclusions on which it relies, and the entire record, it is our opinion that HL&P has the managerial competence and character to complete the design and construction of STP in accordance with applicable regulatory requirements and that there is reasonable assurance that HL&P will have the necessary managerial competence and character to operate the STP safely and in compliance with all applicable NRC requirements. Although one contention (Intervenors' Contention 3) and one CLI-80-32 issue (Issue F) remain to be heard in Phase III, these conclusions are not subject to change except to the extent that the record on Issue F may affect our conclusion as to HL&P's managerial competence to operate the STP.

V.14. This Opinion is based upon, and incorporates, the Findings of Fact and Conclusions of Law which follow. Any proposed findings or conclusions submitted by the parties which are not incorporated directly or inferentially in this Partial Initial Decision are rejected as being insupportable in law or fact or as being unnecessary to the rendering of our Decision.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

VI. JURISDICTIONAL AND PROCEDURAL MATTERS

VI.1. Findings 1-12 in the Phase I PID, appearing in LBP-84-13, 19 NRC at 723-26, are hereby adopted and incorporated by reference.

VI.2. On November 21, 1981, CCANP filed its Motion for New Quadrex Contentions. Among other things, this motion requested the admission of new contentions related to the Quadrex Report.

VI.3. In the Fourth Prehearing Conference Order, the Board ruled that all aspects of the Quadrex Report, including its commissioning, its findings, its submission to and handling by the Applicants, and Applicants' notification of the NRC (including this Board) would be designated for Phase II. At that time, the Board deferred a ruling on CCANP's proposed contentions concerning Quadrex. Id. at 7. The Board also stated that Phase II would include design issues such as the hurricane issue raised by Contention 4, any QA/QC matters not completed during Phase I, and any matters from Phase I which require modification because of subsequent findings. Id. at 5.

VI.4. In an unpublished Memorandum dated June 24, 1982, at 2-3, the Board adopted the Staff's suggestion (agreed to by the Applicants and CCANP), that CCANP's Quadrex contentions be rejected because they were encompassed within existing issues or

within the scope of examination of the Quadrex Report specified in the Fourth Prehearing Conference Order. In an unpublished Memorandum and Order, dated June 22, 1983, at 4-5, the Board directed the parties, and CCANP in particular, to identify the specific Quadrex-related issues which it desired to litigate.

VI.5. On March 14, 1984, the Board issued its Phase I PID, which held that HL&P was not then deficient in character and had not demonstrated character deficiencies that would warrant denial of operating licenses; and that HL&P's competence, while questionable prior to the Staff's 79-19 Investigation and the issuance of the Show Cause Order and Notice of Violation, was not so deficient as to preclude the award of operating licenses. The PID concluded that there was reasonable assurance that structures which were then complete and work which had been performed complied with applicable regulatory requirements and that future work activities (including QA/QC activities) would be carried out satisfactorily. The PID stated that these conclusions were subject to the outcome of the Phase II hearings. LBP-84-13, 19 NRC at 690-91, 693-94, 721-23.

VI.6. In addition to the matters previously assigned for Phase II hearings, the Phase I PID designated for Phase II hearings matters related to the competence of HL&P, Bechtel, and Ebasco as reflected by their performance at STP following the close of the Phase I record. The Phase I PID also required the NRC Staff to file a report concerning these matters. Id. at 697.

VI.7. In our Memorandum and Order, dated May 22, 1984, at 4-6 (unpublished), the Board stated that, in light of the findings in the Phase I PID, no useful purpose would be served by litigating certain character and competence issues CCANP sought to raise in the context of the Quadrex Report. Accordingly, the Board limited Quadrex-related issues in Phase II to those involving the reportability of the Quadrex Report and the adequacy of the corrective action for deficiencies identified in the Quadrex Report. The Board also reiterated its view that these issues required greater particularization prior to the Phase II hearings. In response to a motion for reconsideration filed by CCANP, the Board repeated these rulings in a Memorandum and Order, dated July 10, 1984, at 4-9 (unpublished).

VI.8. In the Fifth Prehearing Conference Order, the Board concluded that CCANP had not set forth any issues suitable for litigation regarding the substantive questions raised by the Quadrex Report. Consequently, the Board ruled that all Quadrex-related issues were dismissed except those issues regarding the reportability of the Quadrex Report which CCANP had set forth in its various filings. In response to a motion for reconsideration by CCANP, the Board reiterated that CCANP had ignored the Board's efforts to obtain a reasonable definition of the substantive questions raised by the Quadrex Report. Given the Staff's comprehensive review of the Report in NUREG-0948 which resolved all substantive Quadrex findings, we had no basis to doubt HL&P's character and competence or to effectuate a significant change in

the findings or conclusions reached in our Phase I PID. Accordingly, the Board limited the Phase II hearing issues relating to the Report to matters involving its reportability. LBP-85-6, 21 NRC 447, 464-66 (1985).

VI.9. At that point, the Board admitted two contentions (Contentions 9 and 10) related to the reportability of the Quadrex Report based upon the filings by CCANP. Contention 9 alleges that the Applicants failed to comply with the reporting requirements of 10 C.F.R. § 50.55(e) with respect to the Report and that this failure reflects adversely on their character and competence. Contention 10 alleges that the Applicants failed to provide the Report to the Board and the parties in a timely fashion under the McGuire doctrine and that this failure reflects adversely on their character and competence. Id. at 462-63. In view of the expansive scope of the Quadrex Report, Contention 9 was restricted by that Memorandum and Order and in subsequent orders to focus on the reportability of the Report as a whole and of specific findings therein for which CCANP had provided a sufficient basis for litigation. Id. at 455-56, 462-63; Sixth Prehearing Conference Order at 9-12; Memorandum and Order, dated May 24, 1985 (unpublished). The Board also expressed its expectation in that Memorandum and Order that HL&P would address and clarify certain matters as part of the testimony to be presented in Phase II, including (1) an apparent inconsistency between the Quadrex Report and testimony in Phase I concerning the adequacy of B&R's services and HL&P's satisfaction with B&R's

services, and (2) a failure of HL&P witnesses in Phase I to mention the Quadrex Report or the pendency of a far-reaching review of B&R's engineering services. LBP-85-6, 21 NRC 447, 458-60 and 462 (1985).

VI.10. In our Phase I PID, we noted that because of the recent termination of B&R and its replacement by Bechtel and Ebasco, we could make only preliminary findings as to the competence of HL&P and its two new major contractors, Bechtel and Ebasco. LBP-84-13, 19 NRC at 697. We therefore directed the Staff to submit a report on various aspects of the performance of HL&P, Bechtel and Ebasco since the close of the Phase I record. Other parties were also invited to submit reports or to comment upon the Staff's report. Id. We required that these reports be submitted in affidavit form and requested the parties to identify with particularity any disputed issues of material fact in the affidavit(s) that should be the subject of hearings. Fifth Prehearing Conference Order at 3-4. We emphasized that the responses should define explicitly any issues which a party believes require further hearings. Id. Accordingly, the Staff, on December 21, 1984, 1/ and Applicants, on February 25, 1985, filed affidavits on these issues; CCANP filed a response to the Staff's affidavit, also on February 25, 1985. CCANP's response to the Staff's affidavit failed to set forth any specific facts which either undercut the statements in the Staff's or Appli-

1/ The Staff filed corrections to its affidavit on January 24, 1985.

cants' affidavits or tended to demonstrate defects in the competence of HL&P or its contractors, and it did not identify explicit issues to be heard. However, CCANP complained that it had not received certain documents the Staff had promised. Accordingly we permitted CCANP to provide additional information along with its response to Applicants' affidavit. Memorandum, February 28, 1985 (unpublished). CCANP did not take advantage of its opportunity to file a response to the Applicant's affidavit.

VI.11. In a telephone conference call on April 4, 1985, we indicated to the parties that we wanted to be certain that CCANP fully understood its obligation to identify specific factual issues concerning competence that it believed should be litigated. After hearing from the parties, we ordered that the Applicants' and Staff's affidavits be treated in the nature of a motion for summary judgment on the issues they addressed. Thus we allowed CCANP a third opportunity to identify any specific facts in dispute which should be addressed in the upcoming Phase II hearings. CCANP filed its response on April 25, 1985 and argument was heard on April 30 and May 1, 1985, during the Sixth Prehearing Conference. In our Sixth Prehearing Conference Order, at 7-9 we determined that CCANP's response did not raise any material issues of fact about the conclusions set forth in the Staff's or Applicants' affidavits, and stated that we would provide the reasons supporting this determination in the Phase II

PID. In that same Order, we directed the Staff to present testimony in the Phase II hearings updating its conclusions on the competence of HL&P and its contractors.

VI.12. In a Memorandum and Order dated March 29, 1985, the Board ruled that matters related to HL&P's competence with respect to certain soils questions should be explored in Phase II. LBP-85-9, 21 NRC 524, 529-30 (1985). These matters were admitted as Issue B/D-1 in our Sixth Prehearing Conference Order at 8.

VI.13. In the Sixth Prehearing Conference Order, the Board also resolved Contention 4 in favor of the Applicants by granting their motion for summary disposition. Sixth Prehearing Conference Order at 4-6.

VI.14. Finally, prior to our Sixth Prehearing Conference, CCANP moved to reopen the record in Phase I to receive evidence regarding the timing of the replacement of B&R. Included among CCANP's filings were allegations regarding the truthfulness of certain testimony of an Applicants' Phase I witness and an assertion that HL&P counsel improperly manipulated the timing of the replacement of B&R to influence the Phase I hearing. In the Sixth Prehearing Conference Order, the Board denied CCANP's motion to reopen. It also ruled that Contention 10 was broad enough to include reporting of the replacement of B&R which we then perceived might be an outgrowth of the Quadrex Report. Id. at 3-4.

VI.15. Evidentiary hearings in Phase II were held in Bay City, Texas, on July 11-13, and in Houston, Texas, on July 15-19, July 29-August 3, August 5-9, and August 13-14, 1985. Limited appearance statements were received during the sessions held on July 13 and July 15, 1985. The record was closed on August 14, 1985, with the exception of receipt of an affidavit dated September 4, 1985, from Charles G. Thrash responding to questions agreed upon by the Board and parties in a telephone conference call on August 20, 1985. See Tr. 15381-85, 15387.

VI.16. CCANP, the NRC Staff, and the Applicants were each represented and participated in the Phase II hearings. The State of Texas was not represented and did not participate.

VI.17. The Applicants presented nine witnesses or panels of witnesses during the Phase II hearings: Jerome H. Goldberg; Don D. Jordan; James R. Sumpter; Loren Stanley; a panel of Sidney A. Bernsen and Frank Lopez, Jr.; a panel of Thomas J. Jordan, Alfredo Lopez, and Walter R. Ferris; George W. Oprea, Jr.; Richard A. Frazar; and Mark R. Wisenburg. The NRC Staff presented five witnesses or panels of witnesses during the Phase II hearings: Joseph I. Tapia; a panel of Eric H. Johnson, George L. Constable, Robert G. Taylor, and Robert F. Heishman; a panel of Donald L. Garrison, Claude E. Johnson, Dan P. Tomlinson, Danny R. Carpenter, and H. Shannon Phillips; a panel of H. Shannon Phillips and Donald E. Sells; and, in response to a request from CCANP and an order from the Board, (Tr. 13019-20), John T. Collins. Through means of subpoenas issued by the Board, CCANP

presented two witnesses during the Phase II hearings: Jesse Poston and Cloin G. Robertson. In rebuttal, the Applicants recalled Messrs. Sumpter and Oprea.

VI.18. In addition to Messrs. Robertson, Poston, and Collins, CCANP sought to call as witnesses individuals affiliated with the NRC Staff or Applicants. As is explained below, the Board denied CCANP's requests for these individuals to testify.

- o CCANP sought to call Commissioner Thomas Roberts. The Board denied this request on the grounds that 10 C.F.R. § 2.720(h) does not permit the Board to direct a commissioner to testify. See our Memorandum and Order, dated June 24, 1985, at 2-3 (unpublished).

- o CCANP sought a subpoena for Richard DeYoung, a retired NRC official. However, CCANP withdrew its request in its CCANP Specification of Testimony Sought From CCANP Witnesses (Part II) dated July 3, 1985, at 6.

- o CCANP sought to call various NRC Staff attorneys (Reis, Gutierrez, and Lieberman). The Board declined to order Messrs. Reis, Gutierrez and Lieberman to testify. Other NRC Staff witnesses were able to address the matters which CCANP was seeking to raise with these attorneys. Tr. 11345-46, 13019-22. Consequently, testimony from these attorneys was not warranted because it would have been repetitious (see 10 C.F.R. § 2.743(c)), other NRC personnel would have been able to testify to the same matters and CCANP did not make a showing of exceptional circumstances for the calling of these individuals (see 10

C.F.R. § 2.720(h)(2)(i)), and CCANP did not make a showing of compelling need for testimony from attorneys (see United States v. Tamura, 694 F.2d 591, 601 (9th Cir. 1982)). In this regard, we agree with the position taken by the NRC Staff in "Staff Statement Regarding The Permissibility Of Calling Attorneys As Witnesses" (July 3, 1985).

o CCANP sought to call various NRC Staff officials and personnel (Herr, Seyfrit, Madsen, Driskill, and Dircks). In its Specification of Testimony Sought From CCANP Witnesses (Part II), dated July 3, 1985, at 6, CCANP withdrew its request for the testimony of Mr. Madsen. In the case of each of the other four individuals, counsel for the Staff explained that other Staff witnesses would be available to address the matters sought to be raised by CCANP with these individuals. See Tr. 12997-13009. Consequently, we ruled that these individuals could not be called as witnesses under 10 C.F.R. § 2.720(h)(2) because the Staff had designated other witnesses who could address the same topics. Tr. 13019-22. We also noted that, if this proved not to be the case, we might reconsider our ruling. Id. Since CCANP did not renew its request to call any of these individuals following completion of the Staff testimony, and since we were satisfied with the answers provided by the Staff witnesses, we did not call for any of these individuals to testify. Furthermore, we also agree with the positions taken by the Staff (Tr. 12997-13004) and the Applicants (Tr. 13009-11) that the type of

inquiry sought by CCANP regarding the opinions of Mr. Dircks would have been inappropriate and would have a chilling effect upon intra-agency communication and testimony before Congress.

o CCANP obtained subpoenas for various attorneys of the Applicants (Newman, Axelrad, Gutterman, and unnamed Baker & Botts attorneys). Applicants and the Staff argued that calling these attorneys was not necessary because there was no evidence that the attorneys were involved in any "conspiracy" or were otherwise acting in a non-legal role, other witnesses could address the same topics, calling these attorneys would have a disruptive effect on the attorney-client relationship, and CCANP did not otherwise make the showing required to call an attorney for another party. See Tr. 11363-65, 11371-77, 11383-85, 11399-11401; "Applicants' Memorandum Concerning The Permissibility Of And Need For Calling Certain Attorneys For The Applicants As Witnesses" (July 2, 1985). See also, "Staff Statement Regarding the Permissibility of Calling Attorneys As Witnesses" (July 3, 1985). We agreed with these arguments and ruled that these attorneys should not be called as witnesses because there was no clear necessity for testimony from them. See Tr. 11456. CCANP later renewed its request that Mr. Newman testify. However, as the Applicants and Staff pointed out, Mr. Newman's testimony was not needed to resolve any conflict in the record and, in any case, the testimony from Mr. Newman sought by CCANP would not have been probative. Tr. 14819-23. Accordingly, we found no basis to call Mr. Newman. See Tr. 14823.

o CCANP sought to subpoena various officers and employees of the Applicants and B&R (Powell, Ulrey and Broom) and Mr. Thrash, the Secretary to the STP Owners Management Committee. Both the Applicants and the Staff took the position that the subpoena for Mr. Powell should be quashed because the testimony sought from him was uncontroverted, cumulative, and/or immaterial or irrelevant. Tr. 12942, 12945-46, 12969-70, 12972-73; "Motion Of Applicants To Quash Subpoenas Of Mr. Cloin Robertson, Mr. Jesse Poston and Mr. Michael Powell,"^{2/} (July 18, 1985) at 1-3, 8-10. We agreed with that position. Accordingly, the Board quashed the subpoena for Mr. Powell. See Tr. 12978. CCANP twice moved to reconsider our decision to quash the subpoena for Mr. Powell. Both the Applicants and the Staff argued that CCANP was seeking testimony from Mr. Powell on uncontroverted issues, on topics addressed by other witnesses, issues which were not material, or issues which were outside the scope of CCANP's original subpoena request for Mr. Powell. Tr. 14060-63, 14078-86, 14814-15, 14816-17; "Applicants' Response To CCANP Motion For Reconsideration Of ASLB Ruling Quashing Subpoena For Michael E. Powell" (August 1, 1985). We agreed and accordingly denied both motions for reconsideration. See Tr. 14088-89, 14817. Similarly, the Board did not grant a subpoena for Mr. Ulrey because the testimony which CCANP sought from him would not have been material. See Tr. 14909-10. Finally, the parties were able to

^{2/} The Board denied Applicants' motion to quash the subpoenas of Mr. Robertson (Tr. 12960) and Mr. Poston (Tr. 12988).

arrive at mutually satisfactory arrangements in lieu of direct testimony by Messrs. Thrash and Broom; therefore, neither of these individuals appeared to testify. See Tr. 14802, 15102-04.

VI.19. At the request of CCANP, Messrs. Robertson and Poston were sequestered. Tr. 11456-57. CCANP also requested that Messrs. Goldberg, Sumpter, Stanley, Oprea, Frazar, Powell, Newman, Axelrad and Gutterman, and the unnamed Baker & Botts attorneys be sequestered. The Applicants and the NRC Staff argued that sequestration is not granted as a matter of right in NRC proceedings and that CCANP's request should be denied because CCANP had not made a sufficient showing to warrant sequestration, sequestration would work a hardship on the Applicants, and with respect to Applicants' attorneys, sequestration would effectively deprive the Applicants the counsel of their choice. See Tr. 11425-45, 11445-47, 11454-55; "Applicants' Opposition To CCANP Motion To Sequester Witnesses" (July 10, 1985). We agreed with the arguments of the Applicants and the Staff and decided not to sequester these individuals. See Tr. 11456.

VI.20. During the Phase II hearings, numerous documents were marked for identification as exhibits, and many of these were introduced into evidence. Appendix B provides a list of the exhibits and indicates which were accepted into evidence.

VII. COMMISSIONING, HANDLING AND REVIEW OF THE QUADREX REPORT

VII.1. Extensive testimony was presented at the Phase II hearings with respect to the events surrounding HL&P's commissioning of the Quadrex Report, the conduct of the review by Quadrex and HL&P's response to the Report. We considered that testimony in order to evaluate the implications of those events on HL&P's character and competence and also to determine if there was any factual basis for CCANP's allegations of a conspiracy by HL&P officials to withhold the Report from either this Board or the NRC Staff. In this section of the Findings of Fact we deal with HL&P's commissioning, handling and review of the Quadrex Report, except for its determinations as to the reportability of the 26 specific Quadrex findings in controversy and the Report as a whole, which are covered in Section VIII.

VII.2. HL&P commissioned the Quadrex review in January, 1981 as the result of the desire of its new Vice President, Nuclear Engineering and Construction, Mr. Jerome Goldberg, to obtain an objective assessment of the status of B&R's nuclear engineering and design activities. Goldberg, ff. Tr. 11491, at 4-5; Tr. 12760-61 (Sumpter). Mr. Goldberg wanted a third party assessment of B&R's design activities in order to judge what improvements were necessary to complete the Project successfully, as well as to provide useful information regarding the status of the Project for discussions with HL&P management, the STP co-owners and regulatory authorities. Goldberg, ff. Tr.

11491, at 4-5; Tr. 12761, 12763-64 (Sumpter). In the nuclear industry at this time, it was innovative for a utility to commission an independent review of the work of its architect-engineer. Goldberg, ff. Tr. 11491, at 68. After the third party assessment was authorized, Mr. Goldberg also notified NRC's STP Project Manager, Mr. Donald Sells, that HL&P had commissioned such a review. Goldberg, ff. Tr. 11491, at 9; Sells, ff. Tr. 15190, at 1-2, attachment at 1; Tr. 12498-99 (Goldberg). Quadrex was selected to perform the review because it possessed the necessary resources and objectivity. Goldberg, ff. Tr. 11491, at 5-6; Sumpter, ff. Tr. 12699, at 5; Tr. 12498 (Goldberg).

VII.3. HL&P did not commission a "democratic" review; instead, Quadrex was asked to look for needed improvement in areas where problems were most likely to be found. Tr. 11574-77 (Goldberg). Quadrex was instructed that HL&P was interested in ascertaining B&R's understanding of the significant nuclear engineering issues of then current concern in the nuclear industry. Goldberg, ff. Tr. 11491, at 6; Tr. 12522-23 (Goldberg). The underlying purposes of the review were to assess whether B&R was in the "main stream" of nuclear engineering practice, to evaluate B&R's performance in areas in which there was reason to believe that it might be experiencing difficulty, to assist in benchmarking the status of the Project, and to identify opportunities for improvement in B&R's engineering work. Goldberg, ff. Tr. 11491, at 6-7; Tr. 11690-91, 12600-02 (Goldberg). Mr. Goldberg did not seek an analysis of B&R's

engineering procedures because he knew there were many different ways to successfully perform engineering work. Goldberg, ff. Tr. 11491, at 6-7.

VII.4. Mr. Loren Stanley (Quadrex's Project Manager for the STP review) confirmed Mr. Goldberg's description of the purposes of the review. He testified that it focused on B&R's ability to complete the Project in an efficient and orderly manner, and that Quadrex was asked to conduct its evaluation by reviewing B&R's responses to selected issues known to present difficulties in the nuclear industry or with which HL&P believed B&R, in particular, was experiencing problems. Stanley, ff. Tr. 13047, at 3; Tr. 13073 (Stanley); App. Exh. 60 at 1-1. Mr. Stanley also testified that Quadrex was not asked to evaluate B&R's design or QA procedures against 10 C.F.R. Part 50, Appendix B, and that it did not do so. Stanley, ff. Tr. 13047, at 4.

VII.5. The review was conducted through a series of questions about the STP design prepared by Quadrex on the basis of information provided from HL&P, as well as through the evaluation of various specified design documents, such as drawings and calculations. Goldberg, ff. Tr. 11491, at 7-8; Sumpter, ff. Tr. 12699, at 5-6. Dr. Sumpter, who was, at the time of the review, HL&P's Manager-Nuclear Services, served as HL&P coordinator. Goldberg, ff. Tr. 11491, at 7; Sumpter, ff. Tr. 12699, at 3-4, 8. A series of meetings between Quadrex and B&R was then held in February-March, 1981, first to clarify the questions, and then for B&R to answer them. Goldberg, ff. Tr.

11491, at 7-8; Sumpter, ff. Tr. 12699, at 7; App. Exh. 60 at 2-1 to 2-12. At these meetings, Quadrex requested B&R to identify documentary materials, such as calculations, drawings, and reference documents, that could be examined in support of its answers. Goldberg, ff. Tr. 11491, at 7; App. Exh. 60 at 2-12.

VII.6. HL&P attempted to keep its involvement in the review to a minimum in order to obtain a truly independent third party assessment. Goldberg, ff. Tr. 11491, at 8; Sumpter, ff. Tr. 12699, at 6. HL&P commented on the draft Quadrex questions, but the final decision as to what questions would be asked and how they would be worded was left to Quadrex. Tr. 12836-37 (Sumpter). Although Dr. Sumpter attended almost all of the technical meetings between B&R and Quadrex, he limited his participation in those meetings. Sumpter, ff. Tr. 12699, at 8; Tr. 12806 (Sumpter). Throughout Mr. Goldberg's involvement, he refrained from injecting his personal views into the Quadrex Report and emphasized to HL&P personnel his desire to receive Quadrex's independent views. Quadrex was in complete control of the review, wrote the questions to be answered by B&R, ran the meetings with B&R, and exercised complete editorial discretion. Goldberg, ff. Tr. 11491, at 8; Stanley, ff. Tr. 13047, at 3; Tr. 13116 (Stanley).

VII.7. During the course of the review, Quadrex briefed HL&P on its preliminary results on several occasions. The first such briefing occurred on March 18, 1981, and was a relatively short meeting in which Mr. Stanley described to Mr.

Goldberg and Dr. Sumpter some of his initial impressions of B&R's engineering capability. Goldberg, ff. Tr. 11491, at 9. Mr. Stanley testified that his comments at the meeting were based on limited evidence gleaned during the first two weeks of the review, and that "there was a fairly good chance that some of ... [those] comments would turn out to be not true as ... [Quadrex] gathered more evidence." Tr. 13083 (Stanley).

VII.8. Prior to the March 18 briefing, Quadrex called HL&P's attention to one particular item which it had discovered in its review, related to a typographical error in the applicable ASME code governing stress allowables for upset conditions, which it believed should be reviewed for reportability. Tr. 12783-84 (Sumpter); Tr. 13110-13 (Stanley). HL&P promptly initiated a review by its Incident Review Committee (IRC) which determined that the item was not reportable. Tr. 12783-88, 12791-94 (Sumpter); CCANP Exhs. 94 and 95. During its review Quadrex did not identify to HL&P any other matter requiring a review for reportability. Tr. 13114-15 (Stanley).

VII.9. In the next briefing given by Quadrex, on April 13, 1981, Mr. Stanley and Mr. J. Larry Wray, Quadrex's Vice President, Engineering, briefed several HL&P employees, including Mr. Goldberg, Dr. Sumpter, and Mr. Cloin Robertson, then HL&P's Manager, Nuclear Licensing. Goldberg, ff. Tr. 11491, at 10; Tr. 12807-08 (Sumpter); Tr. 14590 (Robertson). Quadrex summarized a large number of findings on an engineering discipline by discipline basis. While a significant number of findings were

identified, Quadrex did not explain the severity or importance of the various findings. Goldberg, ff. Tr. 11491, at 10. One of the areas deemed potentially significant by HL&P participants on April 13 was computer code verification. Quadrex stated that, while its review was continuing, there was some indication of problems in this area. Accordingly, HL&P requested that Quadrex look closely at the matter and provide additional detail. Id. at 10-11; Tr. 14598-99 (Robertson).

VII.10. During the April 13 meeting, Quadrex did not identify any finding as being reportable or potentially reportable. Goldberg, ff. Tr. 11491, at 11. Mr. Goldberg's notes of the April 13 meeting include lists of items discussed at the meeting, some of which he noted as "potentially reportable." Id. at 11, 14; App. Exh. 57. However, those designations were intended to reflect those areas where Mr. Goldberg felt that further Quadrex review might identify reportable deficiencies, rather than determinations of potential reportability as that term is used in the NRC's guidance on reporting of deficiencies. See Staff Exh. 137. Goldberg, ff. Tr. 11491, at 14; Tr. 12033-39, 12044-46 (Goldberg). At the time, Quadrex's views were preliminary (Tr. 12045-46, 12541-42 (Goldberg); Tr. 13117-18 (Stanley)), and Mr. Goldberg felt that it was necessary for Quadrex to complete its review before any reportability judgment could be made. Goldberg, ff. Tr. 11491, at 14-15; Tr. 12574-77 (Goldberg). Mr. Robertson also testified that he had not yet been provided with sufficient information to initiate a report-

ability review at that time. Tr. 14727-28 (Robertson). Most of the items noted as "potentially reportable" by Mr. Goldberg were, in fact, ultimately determined not to be reportable. Goldberg, ff. Tr. 11491, at 14.

VII.11. Mr. Goldberg also explained why HL&P did not immediately initiate a reportability review of the noted items on April 13 or report them as "potentially reportable." Id. at 15; Tr. 12542-43 (Goldberg). He correctly pointed out that, even before a licensee reports something as "potentially reportable," it must have enough information to determine whether there really exists a basis for concern. Goldberg, ff. Tr. 11491, at 15. Quadrex's conclusions on April 13 were still incomplete and preliminary (Id. at 14; Tr. 12541-42 (Goldberg); Tr. 13117-18 (Stanley)) and Quadrex had not provided sufficient information to initiate a reportability review. Tr. 12542-43 (Goldberg). Accordingly, Mr. Goldberg did not believe that he had a basis for a reportability review until he obtained the text of the Quadrex Report and the documented bases for its ultimate findings. Goldberg, ff. Tr. 11491, at 15.

VII.12. During the April 13 meeting, Mr. Goldberg suggested that Quadrex categorize its findings in a manner that would facilitate HL&P's reportability review as well as assist in setting priorities for corrective action. Goldberg, ff. Tr. 11491, at 15-16; Tr. 11646-47, 11658-60 (Goldberg). In particular, he suggested that Quadrex, in its report, categorize any finding that might pose a serious threat to plant licens-

ability -- areas where HL&P had not satisfied NRC requirements -- as a "most serious" finding. Goldberg, ff. Tr. 11491, at 11-12; Sumpter, ff. Tr. 12699, at 9-10; Tr. 11647-48 (Goldberg). His suggestions for categorizing the Quadrex findings were memorialized in a memorandum to Dr. Sumpter on April 15. App. Exh. 58; Goldberg, ff. Tr. 11491, at 11-12; Sumpter, ff. Tr. 12699, at 9-10; Tr. 11646 (Goldberg); Tr. 12809 (Sumpter).

VII.13. Quadrex believed that Mr. Goldberg's suggested categories were defined too narrowly and would not include all of its findings of consequence to licensing. Accordingly, it broadened the "most serious" category to include matters that, in its judgment, had significance for licensing purposes, whether or not NRC requirements were satisfied. Goldberg, ff. Tr. 11491, at 16; Sumpter, ff. Tr. 12699, at 10; Stanley, ff. Tr. 13047, at 5; Tr. 13137-40 (Stanley). Although HL&P had asked Quadrex to identify items which might be potentially reportable, Quadrex felt it lacked sufficient information to make such a judgment. Stanley, ff. Tr. 13047, at 5; Tr. 11645 (Goldberg). Its "most serious" category was, however, intended to include any findings that might possibly be reportable under NRC regulations. Stanley, ff. Tr. 13047, at 5; Tr. 13140, 13143, 13149-50 (Stanley). Although Quadrex generally was unable to determine if an item was reportable, it was able to judge that certain of its findings were clearly not reportable. Stanley, ff. Tr. 13047, at 5; Tr. 13150 (Stanley).

VII.14. After the April 13 meeting, Mr. Goldberg called the NRC STP Project Manager again and told him that the Report was due soon. He also informed Mr. Sells that some Section 50.55(e) reports might result, and offered to give Mr. Sells and NRC's Office of Nuclear Reactor Regulation (NRR) a briefing on the Report as soon as it became available. Goldberg, ff. Tr. 11491, at 49; Sells, ff. Tr. 15190, attachment at 1; Tr. 15216 (Sells). When Mr. Sells asked whether HL&P planned to file the Report with the NRC, Mr. Goldberg told him that it did not plan to do so, but that the NRC could review it at HL&P's offices at its convenience. Goldberg, ff. Tr. 11491, at 49; Tr. 12658 (Goldberg); Tr. 14740-41 (Robertson); Tr. 15261 (Sells).

VII.15. On April 27, 1981, Mr. Goldberg discussed the Quadrex review at an STP Management Committee meeting. Goldberg, ff. Tr. 11491, at 17; Tr. 14211-12, 14215 (Poston). Portions of the notes for the minutes of the meeting include an entry attributing to Mr. Goldberg a remark suggesting that the "most serious" findings would be reportable to the NRC. App. Exh. 59 at 2130. Mr. Goldberg did not recall whether he had used those particular words, but indicated that, at that time, he would have expected the Quadrex Report to be based on the system of categorization proposed in his April 15, 1981, memorandum (i.e., that the "most serious" category would consist of failures to meet applicable requirements). At that time, he had reached no

judgment on reportability, and could not have done so until HL&P had received the Report and undertaken its own reportability review. Goldberg, ff. Tr. 11491, at 17.

VII.16. In the next briefing of HL&P on April 30, Messrs. Stanley and Wray highlighted their findings for Mr. Goldberg, Dr. Sumpter, and other HL&P personnel. Quadrex gave a similar presentation to B&R on May 1. At the April 30 briefing, more findings were discussed than at either of the two prior briefings, and Mr. Goldberg understood that the findings suggested that B&R was having difficulty in completing the design, that it lacked experience in the uniquely nuclear aspects of the design, and that engineering work in many areas was not yet begun or was in its earliest stages. In some instances, however, Quadrex was essentially offering its opinion regarding the most efficient way to perform the design work, rather than suggesting failures to meet applicable requirements or to conform to generally accepted industry practice. Id. at 12-13. Quadrex did cite concerns regarding the adequacy of B&R's design work in some areas such as HVAC design and computer code verification. Id. at 13.

VII.17. At the time of the April 30 briefing, HL&P did not consider any of the information presented to be potentially reportable pursuant to Section 50.55(e) and did not immediately initiate a reportability review, since it had not been provided with Quadrex's written findings, rationale, or support for its conclusions, all of which were deemed essential to an effective

reportability review. Id.; Tr. 12345-46 (Goldberg). HL&P did recognize, however, that there might be some potentially reportable deficiencies identified in the Quadrex Report, and Messrs. Goldberg and Robertson discussed the steps to be taken to review the Report immediately upon its receipt. Goldberg, ff. Tr. 11491, at 13-14; Tr. 14602 (Robertson).

VII.18. Although Dr. Sumpter saw indications that there were areas which would require close scrutiny for possible reporting to the NRC, he did not believe that, prior to actual receipt of the Report, he had been presented with sufficient information to undertake knowledgeably an evaluation of any matters for potential reportability. Until he received the Report, he had only, in essence, Quadrex's preliminary opinions and information regarding the B&R design. This preliminary information did not, in his opinion, provide an appropriate basis for making a reportability determination. Thus, he also felt that it was necessary to await the Report rather than engaging in a piecemeal review based upon partial and preliminary information. Sumpter, ff. Tr. 12699, at 11; Tr. 12883-85, 12890-92 (Sumpter).

VII.19. On May 6, in anticipation of the receipt of the Report on the next day, Mr. Goldberg wrote a letter to B&R directing it to advise HL&P as to reportability of the Quadrex findings by noon on May 8, and to develop a plan to resolve the

Quadrex findings and to issue any stop work orders required as a result of its determinations. Goldberg, ff. Tr. 11491, at 14, 21-22; Tr. 11710 (Goldberg); App. Exh. 61.

VII.20. On May 7, the Quadrex Report (App. Exh. 60) was delivered to HL&P and a briefing on its contents was held for HL&P and B&R personnel. Goldberg, ff. Tr. 11491, at 17-18. The purpose of the briefing was to facilitate the reportability review by B&R and HL&P, and the Quadrex presentation was limited to the findings in the "most serious" category. Although the discussion began with the generic findings, B&R personnel took issue with the broad observations in the first two generic findings. Tr. 13194-5 (Stanley); Goldberg, ff. Tr. 11491, at 18. Because it appeared that a discussion of the generic findings would be lengthy and would focus on Quadrex's perceptions or opinions rather than its factual determinations (Goldberg, ff. Tr. 11491, at 18; Tr. 11669-72 (Goldberg)), Mr. Goldberg asked Quadrex whether there was any factual basis for the generic findings other than the information in the discipline findings and Quadrex stated that there was no other basis. Goldberg, ff. Tr. 11491, at 18; Tr. 13195 (Stanley). See also Finding VII.33. At the end of the meeting, based on Quadrex's statement that the generic findings were based on the discipline findings, it was determined that only the "most serious" discipline findings would be included in B&R's reportability review. Goldberg, ff. Tr. 11491, at 18-19, 21.

VII.21. Mr. Goldberg described his initial reaction to the Report in considerable detail. Upon a first reading, the Report suggested to him that the magnitude of B&R's engineering problems were far greater than he had expected. Tr. 11706-07 (Goldberg). However, after discussing the Report with Mr. Stanley and Dr. Sumpter on May 7 (Tr. 11706-07 (Goldberg); Tr. 13196 (Stanley)) and again on May 8 with Mr. Robertson and Dr. Sumpter (Tr. 11707-08 (Goldberg); Tr. 14633-34 (Robertson); Tr. 12826-28 (Sumpter)), he was able to put the Report in clearer perspective. Tr. 11707-08 (Goldberg). Although the Report was written in what Mr. Goldberg described as "provocative" language (Tr. 11706 (Goldberg)), the conversations on May 7, as well as the process of going through each of the most serious discipline findings with Mr. Robertson and Dr. Sumpter on May 8 (aided by the conclusions of B&R's review) revealed that a substantial number of findings were subjective and reflected Quadrex's view of "better practice" rather than instances of failure to meet applicable requirements. Mr. Goldberg concluded that his initial impression of the magnitude and nature of the concerns reflected in the Report was not entirely accurate. Tr. 12523-26, 12537-38 (Goldberg). The findings in the Report, with limited exceptions, did not relate to whether B&R design work or the B&R design process violated NRC requirements, but rather identified many areas where the design had not proceeded on an efficient and well-coordinated basis. Goldberg, ff. Tr. 11491, at 19-20. Although there were some design deficiencies mentioned by

Quadrex, for the most part they were deficiencies which had previously been identified on the Project and were being resolved. Id. at 19.

VII.22. Mr. Goldberg regarded the Quadrex Report as a consultant's review containing advisory opinions of the type often reflected in the many technical consultant studies commissioned during the long course of the construction and operation of a nuclear power plant. While the Report provided useful confirmation of his concerns about the adequacy of B&R's engineering organization and its lack of experience, it did not suggest that the design of the STP was fundamentally flawed. Id. at 21. It did point out, however, important problems in the management of B&R's engineering activities. Goldberg, ff. Tr. 11491, at 21.

VII.23. Based upon the direction in Mr. Goldberg's May 6 letter to B&R, cognizant B&R engineering personnel reviewed the Report on May 7. B&R discipline engineers evaluated the most serious discipline findings in their respective disciplines for reportability. Id. at 21-22; Sumpter, ff. Tr. 12699, at 12. In a lengthy meeting running late into the evening of May 7, B&R's chief discipline engineers reviewed their reportability determinations with B&R's most senior engineering management personnel. Sumpter, ff. Tr. 12699, at 12; Tr. 14718-20 (Robertson). B&R had sufficient information available on May 7 to assess the reportability of all of the most serious discipline findings. Tr. 12799-805 (Sumpter); Tr. 14713-14 (Robertson). Dr. Sumpter and

Mr. Robertson attended that meeting. Goldberg, ff. Tr. 11491, at 21-22; Sumpter, ff. Tr. 12699, at 12; Tr. 12812-13 (Sumpter); Tr. 14609 (Robertson).

VII.24. On May 8, Mr. Goldberg received a letter from Mr. Saltarelli, B&R's Project General Manager, providing B&R's advice on the reportability of each of the Quadrex "most serious" discipline findings. App. Exh. 62; Goldberg, ff. Tr. 11491, at 22; Sumpter, ff. Tr. 12699, at 12. Additionally, Mr. Saltarelli's letter also responded to Mr. Goldberg's request for B&R's plan for resolving all of the Quadrex findings and expressed B&R's judgment that no stop work orders would be necessary. App. Exh. 62; Tr. 11713 (Goldberg). Upon receipt of B&R's letter, Mr. Goldberg met with Dr. Sumpter and Mr. Robertson, (referred to below as the "HL&P review team" or "review team") to go through the findings, review B&R's advice and make HL&P's independent decisions on reportability. Goldberg, ff. Tr. 11491, at 22.

VII.25. Use of the HL&P review team was not the usual HL&P practice in May, 1981 for conducting reportability reviews. Normally, such reviews were conducted by the HL&P IRC, made up of the Team Leader, Nuclear Licensing (Mr. Michael Powell); the Project QA Supervisor in the Houston office; and the Supervising Project Engineer-Design Engineering. Mr. Robertson, as Licensing Manager, and Mr. Goldberg both had occasion to review decisions on reportability made by the IRC, and both reviewed and approved the written Section 50.55(e) reports submitted to the NRC. Id.

at 24. The HL&P review team was well qualified to perform the reportability review; the qualifications of the review team members exceeded those of the IRC members. Goldberg, ff. Tr. 11491 at 25; Tr. 12527-31 (Goldberg).

VII.26. The review of the Quadrex Report was performed by the special review team because the Report was very different from the matters usually considered by the IRC in that it covered a wide scope of design considerations, contained a large number of findings and raised a number of questions that required an in-depth understanding of nuclear engineering design and design processes. Goldberg, ff. Tr. 11491, at 25; Tr. 14714-16 (Robertson). Mr. Goldberg felt that the reportability determinations needed to be made by HL&P's most senior engineers - those who had the greatest experience in the nuclear design process - and testified that that was the only reason the Report was not sent to the IRC for review. Goldberg, ff. Tr. 11491, at 25; Tr. 12527-31, 12669-71 (Goldberg). Dr. Sumpter, Mr. Robertson and Mr. Goldberg, were the most experienced HL&P nuclear engineers. Goldberg, ff. Tr. 11491, at 25; Tr. 12528-30, 12561-62 (Goldberg); Tr. 14152-53 (Oprea). Dr. Sumpter, who was HL&P's Manager, Nuclear Services and had been involved in the STP design since its inception, had 11 years of professional experience in nuclear engineering and design activities. Sumpter, ff. Tr. 12699 at 1-4. Mr. Robertson, HL&P's Manager of Nuclear Licensing, had 15 years of nuclear engineering experience. Tr. 14716-18 (Robertson). Mr. Goldberg had 26 years of such exper-

ience. Goldberg and Frazar, ff. Tr. 906, at 3-4. Each of them was familiar with the requirements of 10 C.F.R. § 50.55(e) and had previously considered reportability questions on numerous occasions. Goldberg, ff. Tr. 11491, at 25.

VII.27. We believe that Mr. Goldberg's decision to utilize the services of HL&P's most experienced engineering personnel reflects the seriousness and importance he placed on assuring that an effective reportability review of the Quadrex Report was conducted. Given the detailed findings and considerable length of the Report, use of the special review team was appropriate.

VII.28. The Quadrex Report is a three volume report containing, in Volume I, Quadrex's findings (categorized as "generic" and "discipline" findings) and, in Volumes II and III, the questions Quadrex posed to B&R, B&R's responses and Quadrex's assessments of those responses. The discipline findings are based upon the B&R responses and Quadrex assessments in Volumes II and III of the Quadrex Report. These findings were ranked into five categories, entitled "most serious findings," "serious findings," "noteworthy findings," "potential problem findings," and "other findings." App. Exh. 60 at 4-1 and 4-2. The generic findings were also ranked into two categories entitled "most serious findings" and "serious findings." Id. at 3-1.

VII.29. In conducting its review, the HL&P review team read each of the "most serious" discipline findings and B&R's advice regarding those findings, and then made its own indepen-

dent judgment whether each finding was reportable. Goldberg, ff. Tr. 11491, at 23; Sumpter, ff. Tr. 12699, at 13; Tr. 12583 (Goldberg); Tr. 12827 (Sumpter); Tr. 14636-37 (Robertson). In addition to the Quadrex findings, and the results of B&R's review, the review team members used other information in the Report such as the questions, answers and assessments which formed the bases for the findings in order to assess their reportability. They also had the benefit of Dr. Sumpter's insight gained through his contacts with Quadrex, as well as the information gained by Dr. Sumpter and Mr. Robertson while attending the B&R meeting in the late afternoon and evening of May 7. Goldberg, ff. Tr. 11491, at 23, 33; Tr. 11736-37, 11783 (Goldberg). Finally, the review team's knowledge of the Project design and nuclear design in general assisted it in reaching its determinations. Sumpter, ff. Tr. 12699, at 3-4; Sumpter (supplemental), ff. Tr. 15357, at 1-4; Tr. 12737-41 (Sumpter); Tr. 11563-66 (Goldberg).

VII.30. The review team focused its attention on the most serious discipline findings since those were the most likely to have reportability implications. The Quadrex Report defined the "most serious findings" as "those that pose a serious threat to plant licensability because either (a) the finding would prevent the obtaining of a license or (b) the finding could produce a significant delay in getting a license, or (c) the finding addresses a matter of serious concern to the NRC at this time." App. Exh. 60 at 4-1. Quadrex had indicated that if HL&P

reviewed the "most serious" findings, it would have examined all of those matters with the potential for reportability. Stanley, ff. Tr. 13047, at 5; Tr. 13149-50 (Stanley).

VII.31. The review team did not report all of the "most serious" discipline findings simply on the basis of the definition of that category because the definition did not automatically imply "reportability" under 10 C.F.R. § 50.55(e). For example, some of the Quadrex "most serious" findings related to activities which had not been completed by B&R. The fact that certain design activities may have not yet commenced or been completed generally does not mean there is a deficiency in a design or in QA. Goldberg, ff. Tr. 11491, at 31-32. Similarly, a finding might address "a matter of serious concern to the NRC at this time" but would not necessarily reflect a "deficiency" in design or construction. Id. at 32. Mr. Stanley confirmed that the most serious category included findings "which clearly were not reportable." Stanley, ff. Tr. 13047, at 5.

VII.32. The other four categories of discipline findings were not reviewed by HL&P on May 8 because the characterization of them by Quadrex indicated that they were not reportable. Goldberg, ff. Tr. 11491, at 29. The "serious findings" were not reportable because they did not relate to safety but only to "the generation of reliable power." Id. at 29; see also App. Exh. 60 at 4-1. The "noteworthy findings" were not reportable because they did not relate to safety but only to "project schedule and/or cost increases." Id. The

"potential problem findings" were not reportable because they did not identify deficiencies but only identified subjects warranting "further investigation." Goldberg, ff. Tr. 11491, at 29; see also App. Exh. 60 at 4-2; Tr. 12578-80 (Goldberg). The Board asked whether the "potential problem findings" could include matters that might eventually be reportable. Mr. Stanley indicated that these findings were based upon very preliminary and limited information, and that further investigation would have been necessary to determine whether or not the finding might eventually be reportable. Tr. 13143-44 (Stanley). Finally, "other findings" were not reportable because they did not identify significant deficiencies but only identified "minor items or items that are not amenable to corrective action." Goldberg, ff. Tr. 11491, at 29; App. Exh. 60 at 4-2.

VII.33. The generic findings were not specifically reviewed for reportability because the Report (App. Exh. 60 at 3-1), as well as Quadrex's statements at the May 7 briefing, confirmed that they were "based on the detailed evaluation of each discipline presented in Section 4 of this report." Goldberg, ff. Tr. 11491, at 30; Stanley, ff. Tr. 13047, at 6-7; Tr. 13195 (Stanley). Mr. Stanley testified that the generic findings did not represent "conclusions regarding the existence of any deficiencies in design," but only identified some "common threads" in the discipline findings in order "to assist HL&P in identifying areas HL&P could inquire to determine whether improvements were desirable." "Since the generic findings had

no independent factual basis, a careful examination of the most serious discipline findings by experienced engineers alert to the potential that several most serious discipline findings could, as a group, represent a systematic deficiency would have captured anything reportable under 10 C.F.R. § 50.55(e)." Stanley, ff. Tr. 13047, at 6-7; Tr. 13330-33 (Stanley).

VII.34. Consequently, by reviewing the "most serious" discipline findings, HL&P reviewed all of Quadrex's factual findings that might be reportable under 10 C.F.R. § 50.55(e). Although the review team did not specifically review each generic finding to determine its reportability on May 8, each member had read the generic findings and was sensitive to the concerns expressed in those findings. Goldberg, ff. Tr. 11491, at 30; Tr. 11674-75, 12523, 12630-31 (Goldberg); Tr. 14648-49 (Robertson).

VII.35. B&R advised HL&P that it had identified one potentially reportable deficiency within the most serious discipline findings. Goldberg, ff. Tr. 11491, at 34; App. Exh. 62 at Enclosure 2. The HL&P review team's evaluation identified two additional potentially reportable deficiencies. When it became apparent that at least one item would be reported, Mr. Michael Powell, the Chairman of the HL&P's IRC was called and he joined the meeting. Goldberg, ff. Tr. 11491, at 23; Tr. 14668-69 (Robertson). After the meeting Mr. Powell phoned the NRC and reported the three items discussed in Findings VII.39-41. Goldberg, ff. Tr. 11491, at 23-24; CCANP Exh. 128.

VII.36. On March 15, 1982, HL&P notified the NRC that one additional matter was potentially reportable. That matter related to a common instrument air line in the Fuel Handling Building (FHB) HVAC system which Quadrex identified as violating the single failure criterion. B&R had evaluated the findings related to this design feature (4.3.2.1(a) and 4.8.2.1(a)) as not reportable because the design for this system was incomplete and had not been released for construction. App. Exh. 62 at enclosure 1, 4.3.2.1(a) and 4.8.2.1(a). HL&P had determined on May 8, 1981, that these findings were not reportable for the same reason. Goldberg, ff. Tr. 11491, at 37. However, when the Bechtel Task Force issued its assessment of the Quadrex findings in March of 1982 (App. Exh. 63), it identified these findings as being potentially reportable. Since this was a specific recommendation of the Task Force, HL&P notified the NRC that the FHB HVAC common instrument air line design constituted a potentially reportable deficiency. Subsequently, Bechtel confirmed that the design of the FHB HVAC common instrument air line had not been released for construction. Consequently, HL&P informed the NRC on April 8, 1982, that this item did not meet the criteria for reportability under 10 C.F.R. § 50.55(e). Goldberg, ff. Tr. 11491, at 37-38; Bernsen/Lopez, ff. Tr. 13441, at 92-94.

VII.37. The HL&P review team members testified as to the criteria they used on May 8 to evaluate the reportability of the Quadrex most serious disciplines findings. See Finding VII-38. They also discussed the extent to which the review team

considered, in the context of determining whether there had been a significant QA breakdown (pursuant to 10 C.F.R. § 50.55(e)(1)(i)), whether the findings pertained to an activity that had resulted in a design released for construction (within the meaning of 10 C.F.R. § 50.55(e)(1)(ii)). We had previously criticized the Staff for improperly linking these two aspects of the regulation together and were concerned that HL&P might similarly have concluded that a QA breakdown must be manifested in a deficiency in a final design which had been released for construction in order to be reportable. LBP-85-6, 21 NRC at 455-56. In determining whether a finding was reportable as a significant breakdown in the QA program, the review team did not, in fact, consider whether it pertained to an activity that had resulted in a design released for construction. For example, it determined that findings regarding computer code verification and shielding calculations, respectively, were potentially reportable as significant breakdowns in the QA program without considering whether either finding related to an activity that had resulted in the issuance of a design released for construction. Goldberg, ff. Tr. 11491, at 27-28. Accordingly, HL&P's application of this aspect of the regulation coincided with our understanding of the separate and independent requirements of Subsections 50.55(e)(1)(i) and (ii). Furthermore, Mr. Goldberg's extensive testimony on the application of Subsection 50.55(e)(1)(i) in response to numerous questions and hypotheticals demonstrated his

appreciation of that provision as a criterion for reportability distinct from Subsection 50.55(e)(1)(ii). E.g., Tr. 11752-3, 11773-4, 11778-80 (Goldberg).

VII.38. The review team members were also cognizant of the possibility that findings which may not have been reportable individually, might, when taken as a group of two or more, have been reportable as a significant breakdown in the QA program. They were aware that Quadrex had identified generic findings that encompassed findings from more than one discipline. During their review, the team members were alert to the possibility that several individual findings might, when considered collectively, constitute a significant breakdown in the QA program for STP. The review team did not, however, discern from the discipline findings any pattern of deficiencies in the design QA program for STP or any systematic failure to implement the QA program other than the matters it reported to the NRC. Goldberg, ff, Tr. 11491, at 33-34; Tr. 12539-41, 12619-20 (Goldberg); Tr. 12879-81 (Sumpter); Tr. 14729 (Robertson).

VII.39. The first item determined to be potentially reportable on May 8, involved the failure to consider faulted condition heat loads in the design of portions of the HVAC system. This condition was identified by B&R as being potentially reportable. Goldberg, ff. Tr. 11491, at 34. The HVAC deficiency was the subject of a number of subsequent, interim

reports to the NRC which described HL&P's corrective actions and recurrence control measures. A final report was issued on October 20, 1982. App. Exh. 74.

VII.40. The second item indicated that the methods for identifying whether the computer code versions in use had been verified lacked adequate visibility to the users of those codes. Although B&R's assessment found only procedural problems and concluded that this item was not reportable, HL&P determined that it was potentially reportable. While it could not immediately be determined whether there were design deficiencies that could adversely affect the safety of operation, there was a deficiency in the process of design which represented a possible breakdown in the QA program for STP (i.e., inadequate controls on the use of computer codes in safety-related design activities).

Goldberg, ff. Tr. 11491 at 35; see also Tr. 14671-72, 14700 (Robertson). This item, as well, was addressed in a number of interim reports to the NRC and a final report issued on October 14, 1983. App. Exh. 73.

VII.41. The third item indicated that B&R did not treat shielding calculations as being safety-related and therefore may not have verified the calculations in accordance with its practice for safety-related calculations. B&R had indicated that some shielding calculations might be safety-related, but stated that the item was not reportable because it would not impact the safe operation of the plant or the public health or safety. App. Exh. 62, Enclosure 1 at 4.8.2-1-(d). Again,

although it could not immediately be determined whether this item could adversely affect the safety of operations, HL&P decided to treat it as potentially reportable, because it appeared to identify a deficiency in the design process which represented a significant breakdown in a part of the QA program for STP (i.e., a systematic failure to perform verifications). Goldberg, ff. Tr. 11491, at 35-36; Tr. 14688-90 (Robertson).

VII.42. Mr. Goldberg testified that where it is not possible to determine promptly whether a deficiency could adversely affect the safety of operations, it is HL&P's practice to inform the NRC of the existence of the deficiency as a potentially reportable item if it otherwise satisfies the reporting criteria. After the NRC has been so notified, HL&P determines whether or not the deficiency is, in fact, reportable. Goldberg, ff. Tr. 11491, at 36. This practice is consistent with the NRC's "Guidance-10 C.F.R. 50.55(e), Construction Deficiency Reporting" dated 4/1/80. Staff Exh. 137 at 6-7. After the NRC was notified that the shielding item was potentially reportable, HL&P determined that shielding calculations are generally considered in the industry not to be safety-related and, therefore, that any failure to verify these calculations was not a deficiency in the QA program for STP. Goldberg, ff. Tr. 11491, at 36. Accordingly, this item was subsequently determined not to be reportable and a final report was sent to the NRC on June 5, 1981. App. Exh. 75.

VII.43. Subsequent to May 8, Mr. Robertson and Dr. Sumpter reviewed each of the Quadrex findings, and considered again whether any items which should have been reported had been missed in HL&P's prior reviews. They identified no additional reportable items. Sumpter, ff. Tr. 12699, at 13; Tr. 12823-26 (Sumpter).

VII.44. Other reviews of the Quadrex Report were conducted on behalf of the Applicants and the Staff. These reviews confirmed the conclusions on reportability made by the HL&P review team on May 8, 1981. In March 1982, a Bechtel Task Force issued a report (App. Exh. 63) which reviewed each of the discipline findings in the Quadrex Report. With the exception of the matters pertaining to computer codes, HVAC, and the common instrument air line discussed above, the Bechtel Task Force concluded that none of the discipline findings were potentially reportable. See App. Exh. 63 at 4-9. In December 1982, NRC Region IV issued a review (Staff Exh. 136) of the Quadrex Report which evaluated each of the generic and discipline findings. With the exception of the matters actually reported to the NRC by HL&P, Region IV concluded that the findings in the Quadrex Report and the Report as a whole were not reportable. See Staff Exh. 136 at 19-20, 23, and 405. Finally, at the request of the Board, the Staff undertook another review of the discipline findings in August of 1984 and again concluded that none were reportable with the exception of those actually reported by HL&P. See App. Exh. 77 at Enclosure.

VII.45. In addition to reviews for reportability, the Applicants and the Staff also conducted reviews to ensure that appropriate corrective action was taken in response to the Quadrex findings. As discussed above, even before the Quadrex Report was issued, HL&P sent a letter to B&R which directed B&R to prepare a plan of action to review each finding and establish a strategy for dealing with the identified concerns (including identification of designs which required reverification, reanalysis, or redesign and identification of the need for any stop work orders or deferral of work activities pending completion of the corrective actions). App. Exh. 61. Furthermore, HL&P stressed "the importance to take timely and positive action relative to the Quadrex findings," and it requested B&R Project Management to provide HL&P with a weekly progress report on B&R's activities in this area. Id. Between May and July 1981, B&R developed a corrective action plan in response to HL&P's request and hired various engineering firms to help resolve the problems identified in the Quadrex Report. CCANP Exh. 87 at 3; CCANP Exh. 122 at 1. See, e.g., App. Exh. 73. Implementation of this corrective action program by B&R was scheduled to run through 1982. CCANP Exh. 113 at 4678; Tr. 14149-50 (Oprea). Following the replacement of B&R, HL&P asked Bechtel to review the Quadrex Report and prepare an assessment regarding the management and design actions which should be taken to resolve all of the Quadrex findings (including identification of any findings that might be potentially reportable). Bernsen/Lopez, ff. Tr. 13441, at 6; App.

Exh. 63 at 1-2. This culminated in the issuance of the March 1982 Bechtel Task Force report (App. Exh. 63). Bechtel then developed a work package (EN-619) which described a program for the disposition of the findings in the Quadrex Report.

Bernsen/Lopez, ff. Tr. 13441, at 7-8. Subsequently, the NRC reviewed the Quadrex Report, the Bechtel Task Force report, and EN-619, together with other documents, and issued a report which (in addition to reviewing the Quadrex findings for reportability) concluded that all of the Quadrex findings had been adequately resolved or dispositioned. Staff Exh. 136 at 1-27.

VII.46. In its investigation of the handling of the Report (I&E Report 82-02, Staff Exh. 140), the Staff concluded that, while there was no evidence of a conspiracy to withhold information from the NRC, HL&P apparently had sufficient information prior to the initiation of the Quadrex review, to notify the Staff earlier of the computer code and HVAC items. Johnson and Constable, ff. Tr. 14846, at 7; Staff Exh. 140 at 2; Staff Exh. 141 at Appendix A. The Staff's conclusions were not based upon any information provided to HL&P by Quadrex during its briefings, but on information known to the Project before the Quadrex review was undertaken. The Applicants' response concurred in the Staff's judgment with respect to HVAC, but took issue with the conclusion that sufficient information was available prior to May 8 to report the computer code item. In any event, Applicants' corrective actions addressed both items. App. Exh. 76 at 1-2. With the exception of the foregoing items, the

Staff concluded that HL&P adequately applied the applicable NRC guidance on reportability to the Quadrex Report and reported the items it was required to report. Staff Exh. 136 at Executive Summary; Johnson and Constable, ff. Tr. 14846, at 8-11; Tr. 15159-60 (Phillips).

VII.47. Testimony was also presented regarding the absence of references to the Quadrex Report in either the telephonic notification of the Staff on May 8, or in any of the subsequent written reports on the three potentially reportable items arising out of the Quadrex Report. CCANP contended that the "omission" of such references was a part of the alleged conspiracy to conceal the Report from the Staff or this Board. We see no such ominous intent. Mr. Robertson indicated that it was not HL&P's general practice to include the source of reportable deficiencies, or the manner in which they were detected, in reports to the NRC, that, in his opinion, reference to the Report would not have materially assisted the Staff in evaluating the items reported, and that there was no intent to conceal the Report in this manner. Tr. 14741-47 (Robertson); see also Tr. 12609-10 (Goldberg).

VII.48. With respect to those matters which were determined not to be reportable on May 8, the Board asked the witnesses to address the adequacy of HL&P's documentation of its decisions. In particular, we were concerned that, by not utilizing the IRC's formal procedures, HL&P may not have documented its decisions on reportability in a manner comparable to

the IRC records. Although minutes were not prepared reflecting the review team's rationale for non-reportability of the various findings, several witnesses testified that the available documentation (i.e., the Quadrex Report and the May 8, 1981 B&R Assessment (App. Exhs. 60 and 62)) was comparable and functionally equivalent to the documentation which would have been prepared by the IRC had it reviewed the same items. Tr. 12652-56 (Goldberg); Tr. 12874-75, 12877 (Sumpter). Similarly, Mr. Wisenburg testified that, although the documentation for non-reportable Quadrex findings was not as detailed or extensive as would be generated under HL&P's current procedures, the documentation did satisfy the NRC's guidance. Tr. 14561-65 (Wisenburg). The Staff witnesses testified that there are no regulatory requirements for the documentation of non-reportable items and that HL&P's documentation was adequate to permit the Staff to make its own judgments as to reportability. Tr. 15053-58 (Johnson, Taylor).

VII.49. Apart from promptly conducting its reportability review, HL&P also promptly brought the Report as a whole to the Staff's attention. Mr. Goldberg phoned Mr. Sells and offered to brief him on the Report. Since both Mr. Sells and Mr. Goldberg were going to be in Bay City the first week of the Phase I hearing (which was the week after receipt of the Report), they agreed that that appeared to be the earliest opportunity to brief the Staff on the Report. Mr. Goldberg and Mr. Sells met during the course of the week of May 11, 1981, for about twenty minutes. Mr. Goldberg told Mr. Sells about the three potentially report-

able items that had been reported to NRC Region IV, and that one of those items had been identified as potentially reportable by B&R, while the other two had been identified by HL&P in its review of the Report. He explained that there were a large number of findings and briefed him regarding the general areas of concern. He told Mr. Sells that HL&P intended to take an in-depth look at the issues identified in the Report and that it would take all necessary corrective actions. He also told him, again, that the Report would be available for NRC review at the Project site. Goldberg, ff. Tr. 11491, at 49-50; Sells, ff. Tr. 15190, attachment at 1-2; Tr. 15225-26 (Sells); Tr. 14402-03 (Oprea). Although Mr. Goldberg recollects showing the Report (or at least Volume I) to Mr. Sells at that meeting (Tr. 11336-37, 12532-35 (Goldberg)), Mr. Sells does not recollect seeing the Report at that time. (Sells, ff. Tr. 15190, attachment at 2). We can draw no adverse inferences from what we consider to be a minor difference in their recollections. The material facts are that Mr. Goldberg promptly briefed Mr. Sells on the Report, that the Report was not withheld from the Staff, and that it was readily available for Staff review at its convenience. These facts demonstrate that HL&P was candid and open with the Staff.

VII.50. Mr. Goldberg believed that NRR was the appropriate arm of the NRC to inform regarding the Quadrex Report in view of the fact that, generally, the NRC's technical and engineering expertise was, at that time, concentrated in NRR. He understood that the Region's area of interest was in the identi-

fication of particular deficiencies representing departures from regulatory requirements, rather than the general efficiency of the design process. In advising the Region of the potentially reportable deficiencies as required by 10 C.F.R. § 50.55(e), and in advising NRR through his discussions with Mr. Sells, Mr. Goldberg felt that he was being completely candid in his dealings with the NRC Staff. Goldberg, ff. Tr. 11491, at 50-51. Mr. Oprea also believed that NRR was the appropriate NRC office to inform of the Report, and that apart from HL&P's Section 50.55(e) notifications, there was no apparent reason at the time to discuss the subject further with Region IV. Oprea, ff. Tr. 14095, at 5-6.

VII.51. Mr. Eric Johnson, the NRC Region IV Branch Chief, testified that, while the Region would have preferred that HL&P discuss the Report with them, as well as with Mr. Sells, there was no requirement to do so and HL&P's perception that NRR was the more appropriate arm of the agency to notify was understandable. Johnson and Constable, ff. Tr. 14846, at 9; Tr. 15058-59 (Johnson); Staff Exh. 140 at 4. In 1981, the agency's policy with respect to studies or reports, such as the Quadrex Report, which were not required by NRC regulations was not clear, and the Staff witnesses did not draw negative conclusions regarding HL&P's competence or character based upon its decision to discuss the Report with NRR rather than with Region IV. Johnson and Constable, ff. Tr. 14846, at 10.

VII.52. Another matter that was raised in Phase II by CCANP related to the "consultants list" which we admitted as CEU Exhibit 10 in Phase I. That exhibit was prepared by HL&P at the request of CEU, and consists of a list of consultants employed by HL&P or the STP Management Committee on "Project Management, QA/QC or Inspection of Completed Construction Work (\$10,000 or more in any calendar year since issuance of CP)". CEU Exh. 10. Apparently, CCANP contends that HL&P should have included Quadrex in that list, and that its "failure" to do so reflects its alleged effort to conceal the existence of the Quadrex review from the Board and the parties. We disagree. The list was clearly labeled and contained only those consultants performing services in the areas of project management, QA/QC or inspection of completed construction work. The Quadrex review, on the other hand, evaluated the status of B&R's engineering work on the Project. Tr. 14156, 14160-61 (Oprea). Accordingly, Quadrex should not have been included on the list, and no evidence was presented that suggests that Quadrex was omitted from the list in order to conceal the review from the Board or the parties.

VII.53. Prior to submitting the Quadrex Report to this Board in September 1981, HL&P made no attempt to keep the Quadrex Report secret or confidential. The Report was treated like numerous other reports and studies on the Project. It was distributed to individuals who would have a reason to want the information contained in it, it was not marked secret or confidential, and there were no instructions that it be kept secret.

Goldberg, ff. Tr. 11491, at 52; Tr. 12404-06, 12671-72 (Goldberg); Sumpter, ff. Tr. 12699, at 14; Tr. 12868-69, 12887-88 (Sumpter); Tr. 14740-42 (Robertson); Tr. 14462-63 (Frazar). Mr. Goldberg did consider whether it should be sent to the NRC, particularly in light of Mr. Sells' original inquiry during their April telephone call (see Finding VII.14). There was, however, no regulatory requirement that it be submitted to the NRC, and, as it was not HL&P's general practice to file consultant's reports with the NRC, he decided not to do so. Goldberg, ff. Tr. 11491, at 52; see also Tr. 12405, 12507-08, 12554, 12605-06, 12612, 12658 (Goldberg); 12885-88 (Sumpter).

VII.54. Mr. Goldberg indicated that he knew that if the Report were transmitted to the NRC, it would be sent, in the ordinary course of business, to the Public Document Room. It had been written rather hurriedly and, in some cases, on the basis of incomplete information. Thus, he knew that it reflected some judgments about acceptable engineering practice which he did not share, and believed that there was a high likelihood that the Report could be misread or quoted out of context if it were made publicly available without extensive explanatory materials. He had, of course, made clear to the NRC that the Report would be available for its review. Goldberg, ff. Tr. 11491, at 52; see also Tr. 12399, 12404-05, 12603-06, 12658 (Goldberg).

VII.55. An NRC inspector and an investigator (Messrs. Phillips and Herr), in the course of an investigation in August, 1981, requested a copy of the Report from Mr. Frazar, HL&P's QA

Manager. Since he did not have a copy of the Report, Mr. Frazar called Mr. Oprea, who made clear that the Report should be provided to the Staff for review despite the fact that it had not been made publicly available. Oprea, ff. Tr. 14095, at 6; Tr. 14179-81 (Oprea); Frazar, ff. Tr. 14412, at 3-4; Tr. 14418-19 (Frazar). Mr. Robertson also instructed inquiring HL&P personnel to make the Report available. Tr. 14705 (Robertson). A copy was made available to Messrs. Phillips and Herr the next day as well as the following week at the STP site. Tr. 14705 (Robertson); Phillips (Quadrex), ff. Tr. 15192 at 3-4. Mr. Phillips testified that he was given an adequate opportunity to review it (Tr. 15251-52 (Phillips)), and perceived "no reluctance" by HL&P to provide the Report (Tr. 15252 (Phillips)). In fact, the existence of the Report was volunteered to him in the course of his August, 1981 investigation. Phillips (Quadrex), ff. Tr. 15192, at 3-4; Tr. 15251-53 (Phillips). Mr. Frazar further indicated that he was aware of no restriction on making the Report available to the Staff apart from HL&P's request that it be reviewed at HL&P's offices. Frazar, ff. Tr. 14412, at 4; Tr. 14420-21 (Frazar). Neither Mr. Sells nor Mr. Phillips found it unusual that HL&P decided to make the Report available for Staff review only at HL&P's offices. Tr. 15252-55 (Phillips); Tr. 15253-55 (Sells). Neither felt that HL&P was attempting to improperly withhold the Report from the Staff or the Board. Tr. 15254 (Sells, Phillips).

VII.56. In August of 1981, when Mr. Oprea realized that Region IV might not be aware of HL&P's discussions with Mr. Sells, or might be concerned as to why they were not provided with a similar briefing, he arranged for a meeting with Region IV personnel. He and Mr. Goldberg participated in a meeting on September 8 with a large group of NRC personnel. Goldberg, ff, Tr. 11491, at 53; Tr. 12417-18 (Goldberg); Oprea, ff. Tr. 14095, at 6-7, Tr. 14303 (Oprea); Tr. 15292 (Collins); CCANP Exh. 140. They described the Quadrex review and its results, including the areas reviewed, the number and significance of the findings and HL&P's plans for resolving the findings. The Region emphasized the importance of dispositioning all of the findings and HL&P agreed that it would do so. Goldberg, ff. Tr. 11491, at 53; Oprea, ff. Tr. 14095, at 7; Tr. 14404 (Oprea). The Region also raised the question of whether the Quadrex Report as a whole was reportable under 10 C.F.R. § 50.55(e). Goldberg, ff. Tr. 11491, at 53. Mr. Collins testified that at the meeting he encouraged HL&P to consider submitting the whole report as a Section 50.55(e) item; however, in retrospect, based on what he has since learned about the Report, he does not believe that it should have been submitted. Tr. 15347-48 (Collins). Mr. Goldberg and Mr. Oprea testified that, as HL&P told the Region in 1981, the Report was not reportable. See Goldberg, ff. Tr. 11491, at 54; Tr. 12507-09 (Goldberg); Tr. 14303 (Oprea).

VII.57. In November 1981, Mr. William J. Dircks, the NRC Executive Director for Operations appeared at a Congressional hearing on "Quality Assurance in Nuclear Powerplant Construction." His prepared statement, which mentioned STP and four other projects, included remarks referring to the Quadrex Report and indicating a belief that Quadrex had identified QA deficiencies. CCANP Exh. 147A. However, as of November 1981, the Staff had not yet performed any comprehensive reviews of the Quadrex Report. As early as the prehearing conference of December 8, 1981, counsel for the NRC Staff noted that Mr. Dircks had spoken in guarded language (using terms such as "apparently" and "it appears" throughout his statement) (Tr. 9166) and that the Staff could not take a definitive position regarding the Quadrex Report until more facts were developed (Tr. 9064). Mr. Collins, the NRC Regional Administrator who had reviewed and approved the statement prepared for Mr. Dircks, confirmed that it was based on a preliminary review of the Report, that subsequent comprehensive reviews performed by the Staff found no reportable QA breakdown in the Report, and that he does not believe that the entire Report should have been submitted under 10 C.F.R. § 50.55(e). Tr. 15291-92, 15347-48 (Collins). It is apparent that Mr. Dircks' statement was an initial reaction to a complex document, and we find that the Staff's current position is more soundly based on careful reviews and comprehensive analyses of the Quadrex Report.

VII.58. In early 1982 the Staff investigated an allegation that HL&P conspired to withhold the Quadrex Report from the Commission (I&E Report 82-02). Staff Exh. 140. After interviewing Messrs. Oprea, Goldberg, Sumpter, Stanley, Robertson, Frazar, Sells and various Region IV employees, the Staff concluded that the allegation of conspiracy was not substantiated. Id. at 2. The Staff witnesses at the hearing uniformly concurred that there was no evidence of any effort to conceal the Report from the Staff or the Board and no reluctance on HL&P's part to provide the Report to the Staff. Tr. 15042-43 (Johnson); Tr. 15252-54 (Phillips, Sells). See also Tr. 15315 (Collins).

VII.59. Accordingly, we conclude that the record of HL&P's commissioning and handling of the Quadrex Report, including the conduct of its reportability review and its efforts to keep the Staff informed regarding the status of the Quadrex review and any reportable items, demonstrates that there has been no conspiracy to withhold access to or conceal the Report from the Staff. On the contrary, as discussed more fully in Section II of our opinion, that record reflects favorably on HL&P's character and competence.

VIII. REPORTABILITY OF THE QUADREX REPORT
UNDER 10 C.F.R. § 50.55(e)

A. Introduction

VIII.1. As we discussed above, the Board, in LBP-85-6, 21 NRC at 462-63, admitted into controversy Contention 9.

Contention 9 states as follows:

The Applicants' failure to notify the NRC (Region IV) of the Quadrex Report, and of many findings beyond those actually reported, within 24 hours from the time HL&P became aware of the findings or prospective findings of the Report (including drafts), violates 10 C.F.R. § 50.55(e)(2) and reflects adversely on the character and competence of the Applicants and on their ability to manage the construction and operation of a nuclear power plant.

Specifically, the Board ruled that CCANP had provided a sufficient basis under Contention 9 for litigating the reportability of the Quadrex Report as a whole and twenty-six specific findings in the Report, consisting of the ten "most serious" generic findings (3.1(a) through 3.1(j), inclusive) and sixteen of the "most serious" discipline findings (4.1.2.1(b), 4.3.2.1(a), 4.3.2.1(d), 4.3.2.1(n), 4.5.2.1(b), 4.6.2.1(n), 4.7.3.1(a), 4.7.3.1(b), 4.7.3.1(k), and 4.8.2.1(a) through 4.8.2.1(g), inclusive). LBP-85-6, 21 NRC at 455-56 and 462-63; Sixth Prehearing Conference Order, dated May 17, 1985, (unpublished) at 9-12 ; Memorandum and Order, dated May 24, 1985 (unpublished).

VIII.2. Applicants called three witnesses to address the application of 10 C.F.R. § 50.55(e) to the Quadrex Report and the 26 Quadrex findings in controversy: Jerome H. Goldberg, HL&P Group Vice President, Nuclear; Sidney A. Bernsen, Bechtel Power Corporation Quality Assurance Manager; and Frank Lopez, Jr., a Bechtel Energy Corporation Assistant Project Engineer assigned to the STP. (Dr. Bernsen and Mr. Lopez are hereinafter referred to as the "Bechtel witnesses"). The NRC Staff called four witnesses to address this matter: Eric H. Johnson, Acting Deputy Director of the Division of Reactor Safety and Projects, and Branch Chief, Reactor Project Branch 1, NRC Region IV; George L. Constable, Section Chief, Project Section C, Reactor Project Branch 1, NRC Region IV; Robert G. Taylor, Project Inspector, NRC Region IV; and Robert F. Heishman, Chief of Reactor Construction Programs Branch, Division of Inspection Program, NRC Office of Inspection and Enforcement. Various other witnesses also testified regarding a few of the Quadrex findings at issue during cross-examination, as mentioned below in connection with our discussion of the individual findings. Additionally, several written evaluations of the reportability of the findings in the Quadrex Report were received into evidence, including a May 8, 1981, B&R assessment of the most serious discipline findings (App. Exh. 62), a March 1982 report by the Bechtel Task Force (App. Exh. 63), a December 1982 report by the NRC Staff (Staff Exh. 136), and an August 1984 analysis by the NRC Staff (App. Exh. 77).

VIII.3. Mr. Goldberg's professional experience and educational background, as described in our Phase I PID, included over 25 years of Nuclear Engineering experience, including more than 17 years as a manager. 19 NRC at 777. Mr. Goldberg received a Bachelor of Science degree in Marine Engineering from the U.S. Merchant Marine Academy and a Master of Science degree in Nuclear Engineering from MIT, and is a registered professional engineer in seven states. Prior to joining HL&P as Vice President, Nuclear Engineering and Construction in October 1980, he had been employed by Stone & Webster for approximately nine years in various engineering and engineering management positions up to his ultimate position as Vice President and Deputy Director of Construction. He had previously been employed at the Quincy, Massachusetts, ship building yard for 16 years in various positions involving engineering, design, construction and fueling of nuclear surface warships and submarines, ultimately as Nuclear Construction Manager. Goldberg/Frazar, ff. Tr. 860, at 3-4. Mr. Goldberg's testimony, in addition to addressing HL&P's commissioning and handling of the Quadrex Report, as described above, also addressed the reportability of the Quadrex discipline findings at issue and the bases for HL&P's position that all reportable deficiencies identified in the Quadrex Report were promptly reported after receipt of the Report. The Board finds Mr. Goldberg to be extremely well qualified to determine which

types of design deficiencies are reportable under 10 C.F.R. § 50.55(e), and the Board found his testimony to be both convincing and persuasive.

VIII.4. Dr. Sidney Bernsen and Mr. Frank Lopez, Jr., testified as a panel. Dr. Bernsen is the Manager of QA for Bechtel Power Corporation. He received bachelor's and master's degrees in mechanical engineering, and a PhD degree from Purdue University. He has 23 years of professional experience in QA management, project management, engineering management and supervision and nuclear and mechanical engineering. He has been active in QA codes and standards activities, having served as chairman of the various industry groups that wrote and maintained the ANSI N45.2 nuclear QA standards. He also participated in the preparation of various other national and international QA standards, and is currently chairman of the Nuclear Technical Advisory Group reporting to the American National Standards Institute Nuclear Standards Board. He has authored numerous publications on QA. Dr. Bernsen coordinated the preparation of the Bechtel Power Corporation procedures for implementing 10 C.F.R. § 50.55(e) and has given guidance to Bechtel divisions and projects on reporting questions. In 1982, Dr. Bernsen participated in a management role reviewing the report of the Bechtel Task Force which assessed the findings of the Quadrex Report and, among other things, reviewed the reportability of the Quadrex discipline findings. See App. Exh. 63. In 1982-83 Dr. Bernsen also served as a Bechtel Assistant Project Manager for the South

Texas Project. Bernsen/Lopez, ff. Tr. 13441, at 3-4, 6, and attached Statement of Professional Qualifications of Sidney A. Bernsen. Mr. Lopez is a Bechtel Assistant Project Engineer assigned to STP. He received bachelor's degrees in mathematics and physics, and a master's degree in Nuclear Engineering from Texas A&M University. He has 11 years of experience in nuclear power plant engineering and design on various nuclear plant projects in the U.S. and overseas for Bechtel Power Corporation. His engineering duties have included a wide scope of responsibilities for supervision of nuclear analysis, licensing code compliance, quality engineering and interdisciplinary coordination of design activities. From 1981 to 1984, Mr. Lopez was responsible for reviewing, evaluating and dispositioning all Deficiency Evaluation Reports, which are the Bechtel form for evaluation of reportability under 10 C.F.R. § 50.55(e). In 1982, Mr. Lopez's work on the transition of engineering responsibilities from B&R to Bechtel involved supervision of the preparation of various transition work packages, including EN-619, entitled "Review of the Quadrex Report." See App. Exh. 64 (not admitted). The purpose of EN-619 was to establish a program for the evaluation and disposition of the findings in the Quadrex Report. Bernsen/Lopez, ff. Tr. 13441, at 4-8, and attached Statement of Professional Qualifications of Frank Lopez, Jr. The Board finds that Dr. Bernsen and Mr. Lopez are well qualified, by reason of

their extensive experience in QA and Section 50.55(e) reporting activities and their prior involvement in and knowledge of the Project, to address the reportability of the Quadrex findings.

The testimony of the Bechtel witnesses discussed whether the Quadrex findings identified for litigation by the Board represented a significant breakdown in any portion of the QA program for STP within the meaning of 10 C.F.R.

§ 50.55(e)(1)(i) and whether the Quadrex Report as a whole should have been provided to the NRC Staff under 10 C.F.R. § 50.55(e). The Board found the testimony of these witnesses to be extremely helpful in understanding typical engineering and design activities in the nuclear industry which are acceptable under Appendix B to 10 C.F.R. Part 50. Furthermore, the Board was convinced and persuaded by their testimony that a large number of Quadrex findings did not identify violations of Appendix B but only recommendations by Quadrex for improving B&R design activities.

VIII.5. Mr. Heishman studied at Upper Iowa University and the Army Nuclear Power Program. His 26 years of professional experience include 10 years in the Army Reactor Group in reactor operations and management and 16 years with the AEC/NRC in various reactor inspection and inspection management positions, including acting as chief of the Reactor Operations and Nuclear Support Branch, NRC Region III and supervisor of the Performance Appraisal Team. Since early 1982 he has held his current position, in which he is responsible for the development and maintenance of inspection programs for reactors under construction.

Heishman, ff. Tr. 14846, at attached R.F. Heishman Professional Qualifications. He testified regarding the NRC Staff's interpretation of 10 C.F.R. § 50.55(e) and the Staff Guidance to NRC inspectors on interpretation of that regulation.

Mr. E. Johnson received a bachelor's degree in marine engineering from the United States Naval Academy. His 18 years of professional experience include eight years in the U.S. Navy with various supervisory responsibilities for naval nuclear propulsion plant operation and ten years with the NRC in various reactor inspection and inspection management positions. In his current position, he manages the NRC inspection program for STP through the Chief, Reactor Project Section, Mr. Constable. Johnson and Constable, ff. Tr. 14846, at attached Professional Qualifications of Eric H. Johnson. Mr. Constable received a bachelor's degree in nuclear engineering from the University of Florida and attended the Navy Nuclear Reactor Operator Program. His 21 years of professional experience include seven years in reactor operations and operator training in the Navy, four years as a reactor operator and supervisor while a student at the University of Florida, and ten years with the NRC in various reactor inspection and inspection supervision roles. In his current position he directs the NRC inspection program for STP. Johnson and Constable, ff. Tr. 14846, at Professional Qualifications of George L. (Les) Constable. Mr. E. Johnson and Mr. Constable testified, in part, regarding the three separate reviews of the Quadrex Report performed by the NRC Region IV

staff, including the most recent review performed by Mr. Taylor, each of which considered the reportability of the Quadrex Report and each of the findings at issue in Phase II.

Mr. Taylor has 32 years of professional experience, including 15 years in QC supervision and QA engineering for the U.S. Air Force and in ballistic missile construction projects, six years as a QA engineer for Gibbs and Hill working on the Fort Calhoun Nuclear Power Station, and eleven years with the NRC with various inspection responsibilities. Seidle, et al., ff. Tr. 9205, at attached Professional Qualifications of Robert G. Taylor. Using the Board's interpretation of 10 C.F.R. § 50.55(e) in LBP-85-6, Mr. Taylor testified regarding his review of the Quadrex Report and the findings at issue in Phase II, his conclusions regarding the reportability of the Report and the findings and the extent to which HL&P's determinations on reportability of those findings and the Report reflect on HL&P's character and competence.

The Board finds this panel of NRC Staff witnesses to be well qualified to discuss the NRC Staff's policy on reporting under 10 C.F.R. § 50.55(e) and to address the reportability of the Quadrex findings at issue. The Board found the Staff's policy on reporting to be reasonable and well-considered and its position on the reportability of the Quadrex findings to be helpful in determining whether HL&P should have notified the NRC of additional findings in the Quadrex Report.

VIII.6. As described above in Section VII, the Quadrex Report includes "generic findings", "discipline findings" and two volumes of the questions posed by Quadrex to B&R, with the associated B&R responses and Quadrex assessments of those responses. Contention 9 relates to 26 of those generic and discipline findings, and to the Report as a whole. We discuss first the 16 discipline findings, then the 10 generic findings and finally the Report as a whole.

B. Reportability of the Specific Discipline Findings at Issue
Finding 4.1.2.1(b)

VIII.7. Finding 4.1.2.1(b) states as follows:

There was no evidence of Civil/Structural evaluation of the reasonableness of postulated internal missiles or that the criteria for internal missiles presented in TRD IN209RQ013-A had been implemented in the design (see Question C-9).

App. Exh. 60 at 4-6.

VIII.8. Mr. Goldberg testified that this finding was not potentially reportable because it did not identify a deficiency in a design or in QA for design but rather an activity to be performed in the future as part of B&R's remaining design work. Goldberg, ff. Tr. 11491, at 38-39. In response to questions by CCANP regarding the status of this design work, Dr. Sumpter explained that some design work associated with the generation of internal missiles is performed early (such as turbine orientation and specifications for rotating equipment). Tr. 15367-68 (Sumpter). However, finding 4.1.2.1(b) primarily

deals with protection against postulated internal missiles identified by the hazards analysis, and the HL&P review team knew that these design activities had not yet commenced. Tr. 11783, 11794-95 (Goldberg); Tr. 15367-68 (Sumpter). These activities are usually performed late in the design process when the relative location of components and equipment is finalized. At that time, potential sources of missiles and targets can be identified, and it is then possible to determine which measures should be utilized to protect against potential missiles. Goldberg, ff. Tr. 11491, at 38-39; Bernsen/ Lopez, ff. Tr. 13441, at 91-92; Sumpter, ff. Tr. 15357, at 3-4; Tr. 11804-07 (Goldberg); Tr. 14043-48 (Bernsen/Lopez); Tr. 15367-68 (Sumpter). As a result, when the Board asked whether this finding represented a "close call" with respect to potential reportability, Mr. Goldberg and the Bechtel witnesses testified that it did not. Tr. 11804-07 (Goldberg); Tr. 14043-48 (Bernsen/Lopez).

VIII.9. Mr. Taylor of the NRC Staff testified that he would need "[m]ore information" to determine whether this finding was reportable under 10 C.F.R. § 50.55(e). As a result, in "a very close call," he believed that the finding should have been reported as a "potential deficiency." Taylor, ff. Tr. 14846, at 36-37. However, he also testified that he did not know whether HL&P personnel on May 8, 1981, were familiar with B&R's handling of missiles in the design of STP. Tr. 15001 (Taylor). As is indicated above, the HL&P review team was aware of the design process for protection against internal missiles and therefore

was able to conclude that this finding did not identify a potentially reportable deficiency. Thus, it appears that Mr. Taylor's "very close call" with respect to the potential reportability of this finding was based on a lack of information which was possessed by the HL&P review team.

VIII.10. The Bechtel witnesses explained that this finding did not identify a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 91-92. Other reviews of the Quadrex Report, including reviews by the NRC Staff, confirmed that this finding did not identify a potentially reportable deficiency. App. Exh. 62, Enclosure (1) at Item Number 4.1.2.1(b); Staff Exh. 136, at 19-20; App. Exh. 77, Enclosure at 1. CCANP adduced no evidence to the contrary.

VIII.11. The Board finds that finding 4.1.2.1(b) did not identify a deficiency in a design or in QA for design but only an activity that had not yet been performed. Consequently, HL&P was correct in its determination that finding 4.1.2.1(b) did not identify a potentially reportable deficiency. Mr. Taylor's judgment that this finding was potentially reportable was based only on the information available to him. Additional information, not available to Mr. Taylor but known by HL&P, enabled HL&P to conclude that the finding was not potentially reportable. Moreover, as we find below in Section VIII.E, even if we were to agree with Mr. Taylor's "very close call" on this finding, we

would also share his conclusion (Taylor, ff. Tr. 14846, at 37-38) that failure to notify the NRC Staff of this matter would not adversely reflect on HL&P's character and competence.

Finding 4.3.2.1(a)

VIII.12. Finding 4.3.2.1(a) states as follows:

The common instrument air line, as depicted in FSAR drawing 9.4.2-2 attached to Question R-6, does not meet the single failure criterion required by IEEE 279-1971 and 10 C.F.R. 50 (see Question E-15). The occurrence of this design error in the late 1970's in concert with the B&R response to other single failure criterion questions suggests that B&R is not sufficiently experienced in the performance of a Failure Mode and Effects Analysis that crosses discipline boundaries.(5) In most organizations, the I&C discipline would detect and immediately correct this type of design error by performing a rigorous examination of the separation provided between redundant divisions in the safety-related portions of the plant for all involved disciplines.

(5) Instrument line blockage was identified as a potential concern for single failure analyses in the 1970 period when an early B&W plant had three instruments connected to two piping taps. Technicians repeatedly replaced the instrument connected to one tap because it read differently than the other two instruments connected in common to the other tap; only later did they discover that a blocked instrument line was causing the two common instruments to read erroneously.

App. Exh. 60 at 4-21.

VIII.13. Mr. Goldberg testified that this finding was not potentially reportable because the design of the common instrument air line had not been released for construction and because the finding addressed only a limited aspect of design and did not suggest the existence of a systemic deficiency.

Goldberg, ff. Tr. 11491, at 37-38, 39-40.

VIII.14. The 1982 Bechtel Task Force (BTF) assessment of the Quadrex Report concluded that this finding identified a condition which represented a potentially reportable deficiency in the design of the common instrument air line, and the NRC was so notified by HL&P. App. Exh. 63 at B-27; Goldberg, ff. Tr. 11491, at 37-38; Bernsen/Lopez, ff. Tr. 13441, at 92-94. Unbeknownst to the BTF (but known by the HL&P review team on May 8, 1981), the design of the common instrument air line had not been released for construction. Tr. 13511-14 (Bernsen/Lopez); App Exh. 62, Enclosure (1) at Item Number 4.3.2.1(a). Subsequently, it was determined that failure of the common instrument air line would not result in a safety hazard and that the design of the common instrument air line had not been released for construction. Accordingly the NRC was informed that this was not a reportable deficiency. Goldberg, ff. Tr. 11491, at 37-38; Bernsen/Lopez ff. Tr. 13441, at 92-94.

VIII.15. Mr. Taylor testified that in his view the finding was not reportable. Taylor ff. Tr. 14846, at 38, 19-21. Reviews of the Quadrex Report on behalf of the Applicants have confirmed that this finding was not reportable (or potentially reportable) and did not represent a significant breakdown in any portion of the QA program for STP. App. Exh. 62, Enclosure (1) at Item Number 4.3.2.1(a); Bernsen/Lopez, ff. Tr. 13441, at 92-94. CCANP adduced no evidence to the contrary.

VIII.16. The Board finds that the design of the common instrument air line had not been released for construction on May 8, 1981, and that finding 4.3.2.1(a) did not indicate the existence of a significant breakdown in any portion of the QA program for STP. Consequently, HL&P correctly determined on May 8, 1981, that finding 4.3.2.1(a) did not identify a condition which represented a potentially reportable deficiency.

Finding 4.3.2.1(d)

VIII.17. Finding 4.3.2.1(d) states as follows:

No formal methodology or documentation exists to verify adequate separation or the single failure criterion (see Questions E-1, E-8, and E-19).

App. Exh. 60 at 4-22.

VIII.18. Mr. Goldberg testified that this finding was not potentially reportable because it did not identify a deficiency in a design or in QA for design. Goldberg, ff. Tr. 11491, at 40. The HL&P review team knew that B&R had a procedure (STP-DC-015) which required that designs be verified for failure analysis and separation. Furthermore, the type of methodology sought by Quadrex for documenting satisfaction of the separation and single failure requirements is not universally used nor required by the NRC, and many projects have been successfully completed without such a methodology. Goldberg, ff. Tr. 11491, at 40; App. Exh. 62, Enclosure (1) at Item Number 4.3.2.1(d); Bernsen/Lopez, ff. Tr. 13441, at 95; Tr. 12025-26 (Goldberg).

VIII.19. The NRC Staff also testified that this finding did not identify a potentially reportable deficiency. Taylor, ff. Tr. 14846, at 40-41. The Eechtel witnesses explained that this finding did not identify a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 95-96. Other reviews performed on behalf of the Applicants and the NRC Staff confirmed that this finding was not reportable or potentially reportable. App. Exh. 62, Enclosure (1) at Item Number 4.3.2.1(d); App. Exh. 63 at B-30; Staff Exh. 136 at 19-20; App. Exh. 77, Enclosure at 2. CCANP adduced no evidence to the contrary.

VIII.20. The Board finds that finding 4.3.2.1(d) did not identify a deficiency in design or QA for design and apparently only represented a recommendation by Quadrex. Consequently, HL&P correctly determined that this finding did not identify a potentially reportable deficiency.

Finding 4.3.2.1(n)

VIII.21. Finding 4.3.2.1(n) states as follows:

It is planned that various types of isolation devices will be used. Actual devices are still under evaluation and qualification. There is no existing document that provides guidance to the designers on the circuit application of these various types (e.g., optical couplers vs. fuses vs. relays, etc.). It is our opinion that lack of such a document (TRD) could result in design errors and licensing problems (see Question E-14).

App. Exh. 60 at 4-23.

VIII.22. Mr. Goldberg testified that this finding was not potentially reportable because, as the finding itself states, the selection of isolation devices at STP was under evaluation. Consequently, although the type of TRD mentioned by Quadrex would be a useful tool, there was no need for such a document at the time of the Quadrex review. Goldberg, ff. Tr. 11491, at 41; Tr. 12027-29 (Goldberg).

VIII.23. In response to questions from CCANP and the Board, Mr. Stanley explained that the finding did not identify either a safety or QA concern due to the preliminary status of the design. Tr. 13151-62 (Stanley). He testified that B&R had not produced very much of the type of design drawings which incorporate the use of isolation devices, though some designs requiring the use of isolation devices had been issued to vendors. Tr. 13154-55 (Stanley). However, the designs that had been released were still preliminary and isolation devices had not yet been installed at STP. Tr. 13153, 13159-62 (Stanley). Mr. Stanley explained that, in the industry, designs are frequently released to vendors to enable them to begin work even though the details of the design have not been finalized. Tr. 13159-61 (Stanley). He testified that since the designs were not final designs released for construction, finding 4.3.2.1(n) did not identify a safety concern but only an activity that had not yet been performed. Tr. 13153 (Stanley).

VIII.24. The NRC Staff also testified that since the designs could be developed without such guidance and that since it was apparent that few, if any, design outputs had been developed by B&R, this finding was not potentially reportable. Taylor, ff. Tr. 14846, at 38-39. The Bechtel witnesses explained that the finding did not identify a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 96. Other reviews performed on behalf of the Applicants and the NRC Staff have confirmed that this finding was not reportable or potentially reportable. App. Exh. 62, Enclosure (1) at Item Number 4.3.2.1(n); App. Exh. 63 at B-36; Staff Exh. 136 at 19-20; App. Exh. 77, Enclosure at 3. CCANP adduced no evidence to the contrary.

VIII.25. The Board finds that finding 4.3.2.1(d) did not identify a deficiency in design or in QA for design but only an activity which had not yet been performed. Consequently, HL&P correctly determined that this finding did not identify a potentially reportable deficiency.

Finding 4.5.2.1(b)

VIII.26. Finding 4.5.2.1(b) states as follows:

EDS did not perform a design review or design verification of preliminary loads transmitted to B&R; these loads have, however, been used as a basis for plant design (see Questions C-4 and M-8).

App. Exh. 60 at 4-39.

VIII.27. Mr. Goldberg testified that finding 4.5.2.1(b) did not identify a potentially reportable deficiency. Preliminary data (with conservative margins of safety) are often used as a basis for design and construction activities, subject to later verification. Such use does not represent a deficiency. Goldberg, ff. Tr. 11491, at 41.

VIII.28. The NRC Staff also testified that the use of preliminary loads prior to verification is often appropriate and that this finding was not potentially reportable. Taylor, ff. Tr. 14846 at 34-35, 42-43. Similarly, the Bechtel witnesses explained that this finding did not identify a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 97. Other reviews of the Quadrex Report performed on behalf of the Applicants and the NRC Staff confirmed that this finding was not reportable or potentially reportable. App. Exh. 62, Enclosure (1) at Item Number 4.5.2.1(b); App. Exh. 63 at B-57 and B-58; Staff Exh. 136 at 19-20; App. Exh. 77, Enclosure at 4. CCANP adduced no evidence to the contrary.

VIII.29. The Board finds that finding 4.5.2.1(b) did not identify a deficiency in a design or in QA for design and apparently represented only a recommendation by Quadrex for improvement by B&R. Consequently HL&P correctly determined that finding 4.5.2.1(b) did not identify a potentially reportable deficiency.

Finding 4.6.2.1(n)

VIII.30. Finding 4.6.2.1(n) states as follows:

Assumptions regarding the availability of various heat sinks under varying plant conditions should be re-examined (see Question N-17).

App. Exh. 60 at 4-61.

VIII.31. Mr. Goldberg testified that finding 4.6.2.1(n) did not identify a potentially reportable deficiency because it did not identify a deficiency in a design or a breakdown in QA. Goldberg, ff. Tr. 11491, at 42. The basis for finding 4.6.2.1(n) was Quadrex's statement in Question N-17 that B&R had not analyzed the temperature of the Essential Cooling Pond (ECP) under conditions of normal shutdown of both units of STP. Id.; Tr. 13253-5 (Stanley) Contrary to Quadrex's finding, B&R had in fact performed an analysis of the ECP under conditions of normal shutdown of both units in accordance with NRC Regulatory Guide 1.27, and the results of this analysis were described in Section 9.2.5 of the Final Safety Analysis Report for STP. App. Exh. 62, Enclosure (1) at Item Number 4.6.2.1(m); Goldberg, ff. Tr. 11491, at 42; Bernsen/Lopez, ff. Tr. 13441, at 97-98; Tr. 12389-90, 12635-66 (Goldberg); Tr. 13908-09, 13848-50 (Lopez).

VIII.32. The Bechtel witnesses also explained that this finding did not identify a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 97-98. Other reviews of the Quadrex Report performed on behalf of the Applicants and the NRC Staff confirmed that this

finding was not reportable or potentially reportable. App. Exh. 62, Enclosure (1) at Item Numbers 4.6.2.1(m) and 4.6.2.1(n); App. Exh. 63 at B-107; Staff Exh. 136 at 19-20; App. Exh. 77, Enclosure at 7. CCANP adduced no evidence to the contrary.

VIII.33. The Board finds that B&R did perform an analysis of the ECP under conditions of normal shutdown of both units of STP and therefore that finding 4.6.2.1(n) did not identify any deficiency in design or in QA for design. Consequently, HL&P correctly determined that finding 4.6.2.1(n) was not potentially reportable.

VIII.34. During the hearing, testimony was heard with respect to two additional matters which are addressed in Question N-17 but which are not encompassed within finding 4.6.2.1(n). First, Quadrex stated in Question N-17 that B&R had not analyzed the ECP under the condition of normal shutdown of one unit in combination with normal operation of the other unit. As was explained extensively during the hearings, failure to analyze this condition is only an economic concern and not a safety concern. Tr. 12390-91 (Goldberg); Tr. 13846-60 (Bernsen, Lopez). Thus, the Board finds that this matter did not represent a potentially reportable deficiency.

VIII.35. Second, Quadrex stated in Question N-17 that there appears to be either an error in or an inconsistency between initial temperatures of the ECP used by the Heavy Civil group and the Nuclear Analysis group, because the groups used different temperatures. This concern forms the basis for finding

4.6.2.1(m) (which is not at issue in this proceeding). Tr. 15098 (Taylor). This concern (and the lack of information regarding it in the Quadrex Report) also formed the basis for Mr. Taylor's conclusion that Question N-17 identified a potentially reportable deficiency. Tr. 15071-72 (Taylor). Mr. Taylor stated that the differences in the temperatures used by the groups "appear[ed] to be a calculational error" that he believed "should have been reported as a potential item pending further evaluation." Taylor, ff. Tr. 14846, at 12-13.

VIII.36. The Bechtel witnesses explained that the use of different temperatures by the Heavy Civil and Nuclear Analysis groups did not indicate that there was a deficiency in the analysis performed by either group. The Heavy Civil group performed an analysis of the ECP under conditions of normal operation in order to optimize the size of the ECP. Tr. 13473-75, 13856-58 (Bernsen/Lopez). The Nuclear Analysis group performed an analysis of the temperature of the ECP under LOCA and normal shutdown conditions and extreme environmental conditions in order to demonstrate compliance with NRC Regulatory Guide 1.27. Tr. 13852-54 (Bernsen, Lopez). Although the temperatures used by the groups were different, each temperature was conservative for its intended purpose. Bernsen/Lopez, ff. Tr. 13441, at 31; Tr. 13852-54, 13856-58 (Bernsen, Lopez). Thus, the use of different temperatures by the Heavy Civil and Nuclear Analysis groups did not involve an error but only the use of different but conservative assumptions by different disciplines

for different purposes. Tr. 13852-54 (Bernsen, Lopez). Consequently, the Board finds that this matter -- even though not in issue in this proceeding -- did not represent a potentially reportable deficiency.

VIII.37. Mr. Taylor's opinion on the potential reportability of Question N-17 also appears to have been predicated upon the fact that HL&P notified the NRC of a potentially reportable deficiency related to ECP temperatures in 1982. See Taylor, ff. Tr. 14846, at 44-46. However, as was explained by the Applicants' witnesses, this potentially reportable deficiency arose from an analysis of the ECP performed by NUS based on design changes that occurred after the Quadrex Report was issued, and it had no relationship to the matters identified in Question N-17. Tr. 11470, 12241-43 (Goldberg); Tr. 13473-75 (Lopez). Thus, it appears that Mr. Taylor, perhaps through a lack of information, mistakenly connected Question N-17 and the potentially reportable deficiency subsequently reported by HL&P.

Finding 4.7.3.1(a)

VIII.38. Finding 4.7.3.1(a) states as follows:

B&R has not yet developed a criteria for jet impingement protection on unbroken piping systems (see Question P-20). A future TRD is planned.

App. Exh. 60 at 4-78.

VIII.39. Mr. Goldberg testified that this finding was not potentially reportable because it did not identify a deficiency in a design or in QA for design but only involved an

activity which had not yet been performed. Goldberg, ff. Tr. 11491, at 43; Tr. 11695-96, 11701 (Goldberg). The NRC Staff also testified that this finding did not identify any inadequacy in the design controls and thus did not identify a potentially reportable deficiency. Taylor, ff. Tr. 14846, at 46-47. The Bechtel witnesses similarly testified that this finding did not identify a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 98. Other reviews of the Quadrex Report performed on behalf of the Applicants and the NRC Staff confirmed that this finding was not reportable or potentially reportable. App. Exh. 62, Enc. (1) at Item Number 4.7.3.1(a); App. Exh. 63 at B-135; Staff Exh. 136 at 19-20; App. Exh. 77, Enclosure at 9. CCANP adduced no evidence to the contrary.

VIII.40. The Board finds that finding 4.7.3.1(a) did not identify a deficiency in design or in QA for design, but only identified an activity which had not yet been performed. Consequently, HL&P correctly determined that finding 4.7.3.1(a) was not potentially reportable.

Finding 4.7.3.1(b)

VIII.41. Finding 4.7.3.1(b) states as follows:

Approximately 50% of the reviewed SDDs do not yet contain system operating temperatures (see Question P-1).

App. Exh. 60 at 4-78.

VIII.42. Mr. Goldberg explained why this finding was not potentially reportable. All but one of the SDDs contained system operating temperatures or referenced documents that did. The one exception had not been released for construction and did not constitute a significant breakdown in any portion of the QA program for STP. App. Exh. 60 at Question P-1; Goldberg, ff. Tr. 11491, at 43-44. The NRC Staff also testified that this finding was not potentially reportable. Taylor, ff. Tr. 14846, at 46-47. The Bechtel witnesses explained why this finding did not identify a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 99-100. Other reviews of the Quadrex Report performed on behalf of the Applicants and the NRC Staff confirmed that this finding was not reportable or potentially reportable. App. Exh. 62, Enclosure (1) at Item Number 4.7.3.1(b); App. Exh. 63 at B-135; Staff Exh. 136 at 19-20; App. Exh. 77, Enclosure at 9. CCANP adduced no evidence to the contrary.

VIII.43. The Board finds that finding 4.7.3.1(b) does not identify a significant deficiency in a final design released for construction or a significant breakdown in any portion of the QA program for STP. This finding apparently represented only a recommendation by Quadrex that SDDs explicitly identify temperatures rather than reference documents that identify temperatures. Consequently, HL&P correctly determined that finding 4.7.3.1(b) was not potentially reportable.

Finding 4.7.3.1(k)

VIII.44. Finding 4.7.3.1(k) states as follows:

B&R assumptions for seismic to nonseismic boundary anchors are probably unconservative and difficult to technically justify as adequate (see Question P-29).

App. Exh. 60 at 4-79.

VIII.45. Mr. Goldberg testified that this finding was not potentially reportable because the design for the boundary anchors had not been released for construction and because the design was still in a draft status undergoing review and therefore did not represent a significant breakdown in QA. Goldberg, ff. Tr. 11491, at 44; Tr. 12254-55 (Goldberg). The Bechtel witnesses also explained that this finding did not identify a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441 at 100. Other reviews of the Quadrex Report performed on behalf of the Applicants and the NRC Staff confirmed that this finding was not reportable or potentially reportable. App. Exh. 62, Enclosure (1) at Item Number 4.7.3.1(k); App. Exh. 63 at B-141; Staff Exh. 136 at 19-20; App. Exh. 77, Enclosure at 9. CCANP adduced no evidence to the contrary.

VIII.46. Mr. Taylor of the NRC Staff concluded that, in his opinion, this finding identified a condition which represented a potentially reportable deficiency in a design. However, he also testified that it was unclear to him whether the

design had been completed. Taylor, ff. Tr. 14846, at 48-49. Apparently, Mr. Taylor was not aware that this design was still in draft form and had not been released for construction.

VIII.47. The Board finds that the design of the boundary anchors was in draft form and had not been released for construction at the time of the Quadrex Review. Consequently, HL&P correctly determined that this finding did not identify a potentially reportable deficiency in design or in QA for design. Mr. Taylor's conclusion to the contrary was based on the information available to him, this information was not complete, and therefore his conclusion is not adopted by the Board. Moreover, as we find below in Section VIII.E, even if we were to agree with Mr. Taylor's opinion that this finding was potentially reportable, we would also share his conclusion (Taylor, ff. Tr. 14846, at 49-50) that HL&P's failure to notify the NRC Staff of this matter does not reflect adversely on HL&P's character and competence.

Finding 4.8.2.1(a)

VIII.48. Finding 4.8.2.1(a) states as follows:

The instrument air piping, between the valves actuated by redundant radiation monitors and the valves that divert air flow through safety-related filter trains in the FHB HVAC exhaust subsystem, does not meet the single failure criterion (see Question R-6).

App. Exh. 60 at 4-86.

VIII.49. This finding pertains to the same matter as finding 4.3.2.1(a). Goldberg, ff. Tr. 11491, at 45; Bernsen/Lopez, ff. Tr. 13441, at 101; Tr. 13517-21 (Bernsen/Lopez). For the reasons the Board has previously expressed with respect to finding 4.3.2.1(a), HL&P correctly determined that this finding did not identify a potentially reportable deficiency.

Finding 4.8.2.1(b)

VIII.50. Finding 4.8.2.1(b) states as follows:

No procedures exist that define the minimum qualification requirements for ALARA reviewers. Some design drawings have been reviewed and signed off for ALARA. There is limited evidence that proper follow-up has occurred to verify incorporation of ALARA specified designs (see Question R-1).

App. Exh. 60 at 4-86.

VIII.51. Mr. Goldberg explained that this finding was not potentially reportable because it did not identify a deficiency in a design released for construction or a significant breakdown in any portion of the QA program. Goldberg, ff. Tr. 11491, at 45-46. B&R had a procedure (STP-DC-016) that required ALARA reviewers to be selected by the B&R Engineering Project Manager, who was responsible for assuring that they were qualified to perform their assigned functions. Additionally, B&R's procedure required that the ALARA reviewer sign all relevant design drawings to verify that the cognizant engineer had incorporated, as appropriate, the comments of the ALARA reviewer.

This procedure was adequate to ensure that the ALARA review process was properly controlled and performed by qualified individuals. Goldberg, ff. Tr. 11491, at 45-46; App. Exh. 62, Enclosure (1) at Item Number 4.8.2.1(b); Bernsen/Lopez, ff. Tr. 13441, at 102-03.

VIII.52. The NRC Staff also testified that there is no requirement to establish minimum qualifications for ALARA design reviewers, and that this finding was not potentially reportable. Taylor, ff. Tr. 14846, at 50-52. The Bechtel witnesses explained that the B&R procedures provided acceptable measures for assuring compliance with ALARA requirements and that this finding did not identify a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 101-03. Other reviews of the Quadrex Report performed on behalf of the Applicants and NRC Staff confirmed that this finding was not reportable or potentially reportable. App. Exh. 62, Enclosure (1) at Item Number 4.8.2.1(b); App. Exh. 63 at B-150 and B-151; Staff Exh. 136 at 19-20; App. Exh. 77, Enclosure at 10. CCANP adduced no evidence to contrary.

VIII.53. The Board finds that finding 4.8.2.1(b) did not identify a deficiency in a design or in QA for design and apparently only represented a recommendation by Quadrex for improvement by B&R. Consequently, HL&P correctly determined that this finding did not identify a potentially reportable deficiency. Broader questions pertaining to the ALARA program are discussed in VIII. 70-77, infra.

Finding 4.8.2.1(c)

VIII.54. Finding 4.8.2.1(c) states as follows:

Modification of the MAB HVAC system to eliminate filter media needs to be re-examined (see Questions R-5 and R-29).

App. Exh. 60 at 4-86.

VIII.55. Mr. Goldberg testified that this finding was not potentially reportable because the design of the MAB HVAC system complied with the requirements of Appendix I to 10 C.F.R. Part 50 and therefore was not deficient. Goldberg, ff. Tr. 11491, at 46-47. The NRC Staff also testified that this finding was not potentially reportable. Taylor, ff. Tr. 14846, at 51-52. The Bechtel witnesses testified that the STP design complied with applicable requirements and the finding did not identify a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 104. Other reviews of the Quadrex Report prepared on behalf of the Applicants and NRC Staff confirmed that this finding was not reportable or potentially reportable. App. Exh. 63 at B-152; Staff Exh. 136 at 19-20; App. Exh. 77, Enclosure at 10. CCANP adduced no evidence to the contrary.

VIII.56. The Board finds that finding 4.8.2.1(c) did not identify a deficiency. Consequently, HL&P correctly determined that this finding was not potentially reportable.

Finding 4.8.2.1(d)

VIII.57. Finding 4.8.2.1(d) states as follows:

B&R's position that shielding calculations are not-safety-related needs to be re-examined (see Question R-7). Several shielding analyses were performed by NUS; however, there is no indication that B&R has verified this work. Standard models and codes have been used in analyses performed by B&R, yet B&R exhibited a lack of familiarity with and understanding of the codes. A re-review of plant shielding is necessary to ensure that analysis results are properly reflected in design (see Questions R-11, R-12, and R-14).

App. Exh. 60 at 4-86.

VIII.58. In its May 8, 1981, assessment, B&R concluded that this finding was not potentially reportable. App. Exh. 62, Enc. (1) at Item Number 4.8.2.1(d). Nevertheless, the HL&P review team determined that the failure to classify shielding calculations as safety-related was potentially reportable and so notified the NRC. Subsequently, HL&P determined that this matter was not reportable because shielding calculations were not generally classified as safety-related in the industry and because B&R was processing shielding calculations in the same manner as safety-related calculations with respect to checking and verification of adequacy. Goldberg, ff. Tr. 11491, at 35-36; Bernsen/Lopez, ff. Tr. 13441, at 50; CCANP Exh. 132. The NRC Staff also testified that this finding was not potentially reportable. Taylor, ff. Tr. 14846, at 50-52. CCANP adduced no evidence to the contrary.

VIII.59. The Board finds that finding 4.8.2.1(d) was not reportable and that HL&P was conservative in notifying the NRC that this matter was potentially reportable.

Finding 4.8.2.1(e)

VIII.60. Finding 4.8.2.1(e) states as follows:

B&R has not correlated radiation zones to the shielding design and shielding design has not adequately considered ISI requirements or the potential locations for temporary shielding (see Question R-10).

App. Exh. 60 at 4-86.

VIII.61. Mr. Goldberg testified that this finding was not potentially reportable because it identified a requirement for future work and not a deficiency in design. Goldberg, ff. Tr. 11491, at 47. The NRC Staff also testified that this finding was not potentially reportable. Taylor, ff. Tr. 14846, at 50-52. The Bechtel witnesses explained that the finding related to activities which had not yet been performed and did not identify a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 105-06. Other reviews of the Quadrex Report performed on behalf of the Applicants and NRC Staff confirmed that this finding was not reportable or potentially reportable. App. Exh. 62, Enclosure (1) at Item Number 4.8.2.1(e); App. Exh. 63 at B-154; Staff Exh. 136 at 19-20; App. Exh. 77, Enclosure at 10. CCANP adduced no evidence to the contrary.

VIII.62. The Board finds that finding 4.8.2.1(e) did not identify a deficiency in design or in QA for design, but only work not yet performed. Consequently, HL&P correctly determined that this finding was not potentially reportable.

Finding 4.8.2.1(f)

VIII.63. Finding 4.8.2.1(f) states as follows:

Radiation zone drawings based on accident conditions have not been prepared (see Question R-30).

App. Exh. 60 at 4-87.

VIII.64. Mr. Goldberg testified that finding 4.8.2.1(f) was not potentially reportable because it did not identify a deficiency in a design or in QA for design but rather an activity to be performed in the future by B&R as part of its remaining design work. Goldberg, ff. Tr. 11491, at 47-48; Tr. 12273-74 (Goldberg). The NRC Staff also testified that this finding was not potentially reportable. Taylor, ff. Tr. 14846, at 50-52. The Bechtel witnesses explained why the finding did not identify a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 106. Other reviews of the Quadrex Report performed on behalf of the Applicants and the NRC Staff confirmed that this finding was not reportable or potentially reportable. App. Exh. 62, Enclosure (1) at Item Number 4.8.2.1(f); App. Exh. 63 at B-155; Staff Exh. 136 at 19-20; App. Exh. 77, Enclosure at 10. CCANP adduced no evidence to the contrary.

VIII.65. The Board finds that finding 4.8.2.1(f) did not identify a deficiency in design or in QA for design, but only work not yet performed. Consequently, HL&P correctly determined that finding 4.8.2.1(f) was not potentially reportable.

Finding 4.8.2.1(g)

VIII.66. Finding 4.8.2.1(g) states as follows:

A design basis governing removable concrete block walls was not evident (see Question R-11).

App. Exh. 60 at 4-87.

VIII.67. Mr. Goldberg testified that finding 4.8.2.1(g) was not potentially reportable because it did not identify a deficiency in a design or in QA for design but only involved an activity to be performed in the future by B&R as part of its remaining design work. Goldberg, ff. Tr. 11491, at 48. He explained that design of removable concrete block walls must consider seismic design and radiological shielding. B&R had addressed the seismic design and the need to consider radiological shielding design specification, but had not yet addressed shielding considerations applicable to removal of the walls for maintenance and repair operations. Tr. 12274-84 (Goldberg). Mr. Goldberg explained that seismic design should be considered before the walls are erected, but there are various ways to address the radiation protection aspects and it is acceptable to address that aspect later in the design. Tr. 12276, 12278-83 (Goldberg).

VIII.68. The NRC Staff also testified that this finding was not potentially reportable. Taylor, ff. Tr. 14846, at 50-52. The Bechtel witnesses testified that the finding did not identify a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 107. Other reviews of the Quadrex Report performed on behalf of the Applicants and the NRC Staff confirmed that this finding was not reportable or potentially reportable. App. Exh. 62, Enclosure (1) at Item Number 4.8.2.1(g); App. Exh. 63 at B-155; Staff Exh. 136 at 19-20; App. Exh. 77, Enclosure at 10. CCANP adduced no evidence to the contrary.

VIII.69. The Board finds that finding 4.8.2.1(g) did not identify a deficiency in design or in QA for design but only work not yet performed by B&R. Consequently, HL&P correctly determined that this finding was not potentially reportable.

The ALARA Program

VIII.70. In our Sixth Prehearing Conference Order, dated May 17, 1985 (unpublished), at 11, the Board accepted for litigation the issue of whether the ALARA findings in Section 4.8.2.1 of the Quadrex Report represented a significant QA breakdown within the meaning of 10 C.F.R. § 50.55(e)(1)(i). In doing so, the Board noted "that the reportability of ALARA findings was seriously considered by HL&P officials" (citing certain documents supplied to the Board and parties by the Applicants). We discussed above the individual ALARA findings

and found that HL&P's decisions on the potential reportability of the findings in Section 4.8.2.1 were correct and conservative.

In this section we consider other information provided by Quadrex or identified by CCANP regarding the ALARA program for STP. When taken together, we find that this information did not represent a potentially reportable deficiency under 10 C.F.R.

§ 50.55(e)(1)(i).

VIII.71. Initially, it should be noted that Appendix B does not apply to ALARA activities, per se. Consequently doubt is raised whether a breakdown in the ALARA program could constitute a significant breakdown in the QA program within the meaning of 10 C.F.R. § 50.55(e)(1)(i). See Bernsen/Lopez, ff. Tr. 13441, at 101-02; Tr. 14493-97 (Frazar). However, it is conceivable that a deficiency in the ALARA program could impact on the safety of operations and result in a reportable deficiency. Tr. 14549 (Wisenburg). Reflecting his personal philosophy of reporting in questionable cases, Mr. Goldberg testified that he might report a significant breakdown in the ALARA design program. Tr. 12271-72 (Goldberg). In considering this issue, the Board has found it to be unnecessary to rule on whether a significant breakdown in the ALARA program would be reportable. Instead, we have addressed the Quadrex ALARA findings as if Appendix B were fully applicable to ALARA activities, and have found that there would nevertheless have been no potentially reportable deficiency.

VIII.72. At the time Quadrex was performing its review, B&R had an ALARA program which was adequate and typical of that in the industry. Tr. 12893, 12897 (Sumpter); Stanley, ff. Tr. 13047, at 7; Tr. 13095-96 (Stanley); Tr 13908-09 (Lopez). B&R had performed an ALARA review of the plant initially. Tr. 12899 (Sumpter). However, ALARA is an ongoing process and, as the design changes, it is necessary to review those changes from an ALARA standpoint. Tr. 12893-94 (Sumpter). In the case of STP, enough changes in the design had occurred since the initial ALARA review that an ALARA re-review was necessary and was expected to require a major effort. Tr. 12893-94, 12896, 12898, 12899-900 (Sumpter).

VIII.73. During the same period, HL&P had taken a special interest in ALARA and had developed an ALARA program which was the first of its type in the industry. Among other things, it included an ALARA design manual and training program and embodied the philosophy that ALARA should be incorporated in all phases of design and operation and that all engineers should be sensitive to ALARA. Tr. 12758, 12894-96 (Sumpter); Goldberg, ff. Tr. 11491, at 45-46. At the time of the Quadrex review, HL&P had been requesting B&R and its other principal contractors to implement HL&P's ALARA program, but B&R had not yet agreed to do so. Tr. 12758-59, 12896 (Sumpter).

VIII.74. In its review, Quadrex found that an ALARA re-review was needed because some parts of the design had changed and these changes had not yet been reviewed from an ALARA

standpoint. Tr. 12896 (Sumpter). Dr. Sumpter and Mr. Stanley discussed the possibility of using Quadrex's findings as a means of giving B&R a "final push" toward agreeing to implement the HL&P ALARA design program (App. Exh. 71 is a copy of Dr. Sumpter's notes of a phone conversation with Mr. Stanley with respect to this matter on March 13, 1981, which culminated in a letter from Mr. Stanley to Dr. Sumpter dated March 16, 1981 (App. Exh. 65)). Tr. 12759, 12896-97, 12900-02 (Sumpter); Tr. 13096-97 (Stanley). As a result, HL&P and B&R met on March 16, 1981 to discuss the need for an ALARA re-review and whether B&R would adopt the HL&P ALARA program. B&R agreed to do both, as reflected in a subsequent letter dated March 20, 1981, from B&R to HL&P (CCANP Exh. 93). Tr. 12756-59, 12897 (Sumpter); Tr. 13096 (Stanley).

VIII.75. Viewed in this context, the intent and meaning of some of the statements in these exhibits become clear. For example, Dr. Sumpter's March 13 notes (App. Exh. 71) refer to a "breakdown in the ALARA review at the present time." Dr. Sumpter explained that he did not intend to imply that a QA breakdown existed, but instead used the word "breakdown" in order to be "provocative" and to get B&R's attention. Tr. 12901-02 (Sumpter). Similarly, Mr. Stanley's letter of March 16 (App. Exh. 65) refers to an "inconsistency in the conduct of ALARA reviews." Dr. Sumpter explained that this did not indicate the existence of a deficiency or a QA breakdown, but simply reflected that part of the design had been subject to an ALARA review and

that part had changed and the changes had not yet undergone an ALARA review. Tr. 12897-900 (Sumpter). Dr. Sumpter's testimony was corroborated by Mr. Stanley, who testified that the purpose of his March 16 letter was to alert HL&P to the fact that B&R's ALARA program did not satisfy HL&P's goals, and that it was not his intent to identify a significant breakdown in the QA program for STP with respect to ALARA or to identify violations of the ALARA principle. Stanley, ff. Tr. 13047, at 7; Tr. 13101-03 (Stanley).

VIII.76. One final point with respect to ALARA warrants discussion. CCANP Exh. 123 consists of excerpts from various documents related to an 1979 HL&P audit of B&R engineering. One of the excerpts, a memorandum from T.D. Stanley to D.G. Barker, dated October 1, 1979, states that the "auditors identified numerous deficiencies that indicate a breakdown of the B&R engineering program" in the areas of shielding design calculations, ALARA review and Supplier Deviation Requests. In response to questions by the Board, Mr. Frazar testified that it was not uncommon to find the types of problems identified in this audit (Tr. 14467, 14474 (Frazar)); that he did not discern the existence of a pervasive problem in B&R engineering as a result of his review of this exhibit (Tr. 14469-70, 14475 (Frazar)); that he would not characterize the problems identified in this exhibit as a significant breakdown in the QA program (id.); and that the exhibit did not provide enough facts to demonstrate a connection between the problems mentioned in the exhibit and the findings in

the Quadrex Report (Tr. 14481-82 (Frazar)). Similarly, in response to questions from CCANP, Mr. Taylor testified that this exhibit would not cause him to change his conclusion that the ALARA findings in the Quadrex Report were not potentially reportable, that some audit findings did not suggest technical deficiencies, and that others indicated that B&R was not progressing with its work. Tr. 14959-66 (Taylor).

VIII.77. The Board finds that the Quadrex review did not identify a significant breakdown in the QA program for STP with respect to ALARA. The uncontroverted testimony of Dr. Sumpter and Mr. Stanley, together with the context of Dr. Sumpter's notes of March 13, 1981, and Mr. Stanley's letter of March 16, 1981, clearly demonstrate that these statements were not intended to identify a significant breakdown in the QA program for STP. Similarly, the uncontroverted testimony of Mr. Frazar and Mr. Taylor demonstrates that the findings in the 1979 audit did not rise to the level of a significant breakdown in the QA program. In any case, there is no evidence in the record which indicates that the matters raised in this audit were the same as or similar to the findings in the Quadrex Report.

C. Reportability of the Generic Findings

VIII.78. We turn now to the Quadrex generic findings. As we explained above, the Quadrex Report includes a section of generic findings which attempted to identify common threads that appeared in the discipline findings thus suggesting areas in

which HL&P might inquire to determine whether improvements in the design process were desirable. See § VII, supra; Stanley, ff. Tr. 13047, at 5-6. The generic findings did not have factual bases independent of the discipline findings. App. Exh. 60 at 3-1; Stanley, ff. Tr. 13047, at 6-7; Goldberg, ff. Tr. 11491, at 30. Accordingly, the generic findings could only constitute reportable deficiencies if adequately supported by the underlying discipline findings and if they met the definition of 10 C.F.R. § 50.55(e)(i). In this section we consider whether any of the Quadrex most serious generic findings identified a significant breakdown in QA for design within the meaning of 10 C.F.R. § 50.55(e)(1)(i). In so doing, we have not quoted the Quadrex findings in their entirety because of their length. Instead, we have in each instance identified what we find to be the basic Quadrex concerns expressed in each finding, relying, in part, on the characterizations of the Bechtel witnesses (cited as see Bernsen/Lopez), which we found very helpful.

VIII.79. The Bechtel witnesses (Dr. Bernsen and Mr. Lopez) and the Staff witness (Mr. Taylor) reviewed each of the Quadrex generic findings at issue and the support for those findings cited in the Quadrex Report and testified regarding the results of their respective reviews. In addition, other witnesses were questioned by the Board and the parties regarding various aspects of some of the generic findings.

Finding 3.1(a)

VIII.80. Finding 3.1(a) primarily expresses two concerns. First, Quadrex stated that an effective systems integration and overview function and systems engineering function may not have existed at the STP. Second, Quadrex stated that there was an absence of multi-disciplinary design guidance at STP for separation and the single failure criterion and that each discipline was providing its own interpretation and acceptance criteria. See Bernsen/Lopex, ff. Tr. 13441, at 14. See also App. Exh. 60 at 3-1 and 3-2.

VIII.81. The Bechtel witnesses testified that B&R did have a systems integration and overview function and a systems engineering function. Prior to 1980, HL&P relied upon measures such as the use of System Design Descriptions (SDDs), Technical Reference Documents (TRDs), and multi-disciplinary review and comment to provide for systems integration. These measures provide appropriate methods for accomplishing systems integration during the early stages of design. Similarly, B&R provided a systems engineering function through measures such as multi-disciplinary review and comment and designating engineers within various disciplines to coordinate the development of system descriptions which specified multi-disciplinary requirements applicable to a system. These system engineering measures were typical of those used by the industry at that time. In 1980, B&R established a Systems Design Assurance Group (SDAG) to augment B&R's system integration and systems engineering capability. The

Quadrex Report did not include a review of the activities of this group, and the activities performed by the group may not have been evident to Quadrex because most of the reviews performed by the group had not yet been factored into revisions of the design documents being reviewed by Quadrex. Bernsen/Lopez, ff. Tr. 13441, at 16-18, 27-28. This fact was confirmed by Mr. Stanley during cross-examination by CCANP. Tr. 13199-200 (Stanley).

VIII.82. The Bechtel witnesses also explained that a systems integration function and a systems engineering function in the form of discrete functional groups are not necessary to control design interfaces. Although Criterion III of Appendix B to 10 C.F.R. Part 50 requires that design interfaces be controlled, it does not specify how to accomplish such control. Thus, design interfaces may be controlled by methods such as assigning discrete responsibilities to various individuals and organizations, establishing lines of communication which identify responsibilities for decision-making and resolution of problems, and establishing procedures to control the flow and review of design information. B&R had procedures to control design interfaces, which established formal requirements for conducting interfacing activities, including a review and comment process for design and vendor documents and a process for conducting design review meetings. Bernsen/Lopez, ff. Tr. 13441, at 22-24.

VIII.83. Finally, the Bechtel witnesses explained that the Quadrex Report did not identify a significant breakdown in B&R's system integration and system engineering functions or in

its interface controls. As discussed above, B&R had appropriate measures in place to provide these functions. In addition, the Bechtel witnesses reviewed the Report to determine whether Quadrex had identified any deficiencies in design related to the implementation of these measures. With the exception of those deficiencies reported to the NRC, Quadrex did not identify any significant deficiencies. Consequently, the Bechtel witnesses concluded the Report did not identify a significant breakdown in B&R's systems integration and systems engineering beyond the deficiencies which were reported. Id., at 18-19, 22-24.

VIII.84. During the hearing, several witnesses were questioned by CCANP and the Board with respect to systems integration and systems engineering at STP. Each of the witnesses expressed the opinion that there was no significant indication of a breakdown in the QA program in this regard. Mr. Stanley testified that the multi-disciplinary review and comment process was not accomplishing the amount of integration that he expected to see and that there were examples of systems integration work that had not yet been done that should have been done. However, he also was of the opinion that this situation did not constitute a significant QA breakdown. Tr. 13089, 13093-94 (Stanley). Similarly, the Bechtel witnesses had concerns that the multi-disciplinary review and comment process was not accomplishing the systems integration functions in a timely manner. However, they also found that B&R's process was similar to that used on other projects, that B&R's process was being

implemented, and that, in general, the work was being performed without many significant deficiencies in design. Tr. 13543-46 (Bernsen, Lopez).

VIII.85. The Bechtel witnesses also testified that, in general, B&R did have a program to provide multi-disciplinary design guidance. B&R utilized SDDs, which applied to individual systems, and TRDs, most of which applied across systems and disciplines. Additionally, B&R procedure STP-SD-005-B required the SDAG to perform reviews encompassing several systems and disciplines in order to assure the compatibility of the design work performed by the various disciplines. The Bechtel witnesses explained that the absence of multi-disciplinary design guidance for separation and single failure criterion did not indicate a significant breakdown in any portion of the QA program for STP. Appendix B, in general, and Criteria II, III, VI, and XVII, in particular, do not require the use of multi-disciplinary design guidance, nor do they require that each discipline utilize the same design criteria for its work as are being used by other disciplines on their work. As long as the criteria being utilized by each discipline are appropriately conservative for the work it is doing, and as long as the final designs of the systems are compatible, as confirmed during verification activities, the lack of multi-disciplinary design guidance would not be indicative of a significant breakdown in any portion of the QA program. In this regard, the Report did not identify any deficiencies in design related to separation or the single failure

criterion, with the exception of questioning the design of the common instrument air line in the Fuel Handling Building (FHB) HVAC system. Similarly, the Bechtel review of the B&R design during the transition period did not identify any significant problems related to separation or the single failure criterion. Consequently, the Bechtel witnesses concluded that there was not a significant breakdown in the design guidance provided by B&R related to separation or the single failure criterion. Bernsen/Lopez, ff. Tr. 13441, at 19-21, 25-27, 27-28.

VIII.86. The NRC Staff witness, Mr. Taylor, testified that neither of these Quadrex concerns identified a violation of Appendix B requirements. Taylor, ff. Tr. 14846, at 3-4. He also identified an additional sub-item in finding 3.1(a), regarding the failure to convert the fire hazards analysis into a controlled document. However, Mr. Taylor noted that this sub-item did not identify a deficiency. Id., at 4-5. He concluded that Quadrex finding 3.1(a) was not potentially reportable. Id., at 5.

VIII.87. In addition to the above concerns, finding 3.1(a) also stated that a "working interface relationship" among the disciplines was not routine. The Bechtel witnesses explained that this statement did not indicate a significant breakdown in the design interface controls for STP. Quadrex would have liked to have seen greater informal communication among disciplines designing a system so that each discipline knew what the other disciplines were doing. There are benefits in terms of effi-

ciency in routine informal communication among disciplines.

However, the QA program contained appropriate measures intended to provide assurance that the multi-disciplinary aspects of a system were properly accounted for and coordinated.

Bernsen/Lopez, ff. Tr. 13441, at 24-25. Similarly, Mr. Robertson testified that, although B&R lacked informal interaction among disciplines that is beneficial for early resolution of differences between disciplines. B&R design activities were rigorously controlled by procedures under Criterion III of Appendix B. Tr. 14730-32 (Robertson).

VIII.88. In sum, the NRC Staff and the Bechtel witnesses testified that finding 3.1(a) was not potentially reportable and explained in detail why this finding did not identify a significant breakdown in any portion of the QA program for STP. Taylor, ff. Tr. 14846, at 3-5; Bernsen/Lopez, ff. Tr. 13441, at 16-29. A separate review of the Quadrex Report by the Staff also concluded that this finding was not reportable. Staff Exh. 136 at 23, 405. CCANP adduced no evidence to the contrary.

VIII.89. The Board finds that finding 3.1(a) did not identify a significant breakdown in any portion of the QA program for STP. B&R had a system integration function and a systems engineering function, and the information provided in the Quadrex Report does not substantiate that there was a significant breakdown in these functions. Furthermore, the type of multi-

disciplinary design guidance identified by Quadrex is not required under Appendix B. Consequently, the Board concludes that finding 3.1(a) was not reportable or potentially reportable.

Finding 3.1(b)

VIII.90. Finding 3.1(b) primarily expresses four Quadrex concerns: (1) that calculations containing errors were being verified as correct with a higher frequency than should be encountered; (2) that design input was not being consistently reviewed for reasonableness by the recipient and that the use of design output was not being consistently checked by the group providing it; (3) that B&R was not providing adequate guidance to vendors relative to acceptable analysis and testing methods, required data, and report format; and (4) that B&R had a policy that work performed by subcontractor and vendors is verified by these firms, that B&R was not reviewing and approving the analysis methods used by subcontractors and vendors, that B&R did not have documented criteria governing the evaluation process for vendor reports and that its review of vendor reports was not consistent. See Bernsen/Lopez, ff. Tr. 13341, at 29. See also App. Exh. 60 at 3-3 and 3-4.

VIII.91. The Bechtel witnesses explained that the Quadrex statement regarding errors in verified calculations did not indicate a significant breakdown in any portion of the QA program for STP. Quadrex cited four questions in support of its statement. Of these four, one referred to an error previously

identified and reported to the NRC; one identified an error previously identified and accepted because it was conservative; one did not involve an error but only the use of different but conservative assumptions by different disciplines; and the remaining one (Question C-16) stated that there was evidence of a "significant number" of mistakes, but did not identify these mistakes, the number of mistakes, or the number of verified calculations reviewed, nor did it describe the nature or significance of the mistakes it discovered. Thus, the Bechtel witnesses concluded that the information provided in these questions was not sufficient to support a determination that a significant breakdown occurred in verification of design at STP. Id., at 30-32.

VIII.92. In this regard, the Bechtel witnesses noted that, during the course of design and construction of any project as extensive and complex as a nuclear power plant, some calculational errors will inevitably occur, and that it is unreasonable to expect a QA program to preclude all calculational errors. Consequently, the fact that a few calculational errors were identified does not necessarily establish that there was a significant breakdown in any portion of the QA program. With the exception of the deficiencies which were reported to the NRC, no design errors with adverse safety implications were identified by Quadrex. Id., at 32.

VIII.93. Other witnesses arrived at similar conclusions. For example, Mr. Taylor testified that ANSI Standard N45.2.11 recognizes that some errors will reside in designs throughout the entire life of the design work, and that Quadrex's statement that there was excessive error rate does not constitute a violation. Taylor, ff. Tr. 14846, at 8. Similarly, in response to a question from CCANP, Mr. Goldberg testified that the Quadrex Report did not identify extensive errors in calculations; of the four possible errors it identified, only two were errors (one of which was conservative). Tr. 12627-29 (Goldberg). Finally, in response to questions from the Chairman, Mr. Stanley testified that he did not view the error rate observed by Quadrex as being potentially reportable. He observed that B&R still had a lot of work to do and that the "biggest problem" was that B&R had not done the work that Quadrex had expected would have been done at that time. Mr. Stanley stated that Quadrex had looked at eighty to a hundred calculations and had found only a four to five percent error rate (including errors that were conservative), and that there was not a sufficient number of calculations sampled or a sufficient number of errors to conclude that a QA breakdown existed. Tr. 13353-55 (Stanley).

VIII.94. Specifically, with respect to calculations in the civil area addressed in Question C-16 (where Quadrex stated that there was a "significant number of mistakes"), Bechtel generally observed during the transition that, although the analytical methods utilized by B&R were not the same as normal

Bechtel practice, the relatively high degree of conservatism used in the B&R analyses produced an end product in the design which was technically acceptable without redesign or reanalysis. Bernsen/Lopez, ff. Tr. 13441, at 33. Additionally, during cross-examination by CCANP, Mr. Stanley confirmed that the structural design was extremely conservative. Tr. 13130 (Stanley). The Bechtel witnesses also explained that many of the items in the civil/structural area were over-conservative design assumptions which Quadrex defined as "errors". Other "errors" identified by Quadrex included the use of analytical methods which were currently being questioned by the NRC or which were different from those identified in the FSAR, but which were not in and of themselves technically inadequate. Consequently, the Bechtel witnesses concluded that there was no justification for Quadrex's claim that a high error rate existed in the civil/structure area. Tr. 13824-27 (Lopez). Furthermore, when asked by the Chairman whether the over-conservatisms were deliberate or by the "luck of the draw", the Bechtel witnesses testified that, with some exceptions, B&R recognized that the designs were over-conservative. Tr. 13832-35 (Lopez).

VIII.95. The Bechtel witnesses also addressed Quadrex's statement that recipients did not consistently review the reasonableness of input data provided to them and that providers of output data did not consistently check the use of that data, and they explained why it did not indicate a significant breakdown in any portion of the QA program for STP. The

adequacy of data provided across design interfaces is assured through such measures as interdisciplinary document reviews and through design verification. It is not normal industry practice to require a supplier of data to perform a formal review of the use of that data by the recipient. Although it is good practice for the recipient of data to perform an informal review of the reasonableness of input data, in many cases the recipient does not have either the knowledge or experience necessary to conduct such reviews. Bernsen/Lopez, ff. Tr. 13441, at 33-34, 39-41.

VIII.96. Other witnesses arrived at similar conclusions. For example, Mr. Taylor testified that Appendix B does not require that a group which provides data to another group monitor how the receiving group uses that data. Additionally, in many cases, a receiving group has neither the information nor the capability to test the data for reasonableness and must place reliance on the expertise of the group from which they received the data. Taylor, ff. Tr. 14846, at 6-7. Furthermore, in response to questions from CCANP, Mr. Goldberg testified that it is prudent for one group to review input provided by another group for reasonableness if its prior experience permits. However, such a review is not required and, in cases where the receiving group lacks the relevant expertise or experience, such a review is not feasible. Tr. 11631-33 (Goldberg).

VIII.97. During the hearing, the Board questioned whether a "gap" would be created if a receiving group did not perform a review of input for reasonableness and if the supplying

group did not instruct the receiving group. In response, the Bechtel witnesses explained that it was good practice for a receiving group to perform a reasonableness review and for a supplying group to know how its data was going to be used by other groups. However, they also explained that such informal practices could not be relied upon in a QA program under Appendix B, since individuals possess variations in experience and knowledge. As a result, formal methodologies (such as interdisciplinary meetings, interdisciplinary coordination reviews, and design verification) are utilized to assure that the interface between groups properly occurs. Tr. 13888-94 (Bernsen, Lopez).

VIII.98. The Bechtel witnesses also testified that the absence of guidance to vendors relative to acceptable analysis and testing methods, required data, and report format does not indicate a significant breakdown in any portion of the QA program for STP. Criterion IV of Appendix B only requires that procurement documents include or reference "applicable regulatory requirements, design bases, and other requirements which are necessary to assure adequate quality." In general, the "other requirements" may include reference to specific drawings, specifications, codes, or test, inspection, and acceptance requirements. Detailed guidance (as distinct from requirements) on "analysis and testing methods, required data, and report format," may be, but is not required under Criterion IV to be, included in procurement documents. Such details may be left to the discretion of the vendors since the vendors are often in the

best position to know which types of methods or reports best demonstrate compliance with the quality requirements specified by the purchaser. In other words, procurement documents generally specify the criteria which a product must meet, and the vendor usually has discretion to determine how to satisfy those criteria. Bernsen/Lopez, ff. Tr. 13441, at 34-35.

VIII.99. The Board asked Mr. Stanley whether the failure of procurement documents to elaborate on means to satisfy industry standards and NRC regulatory guides was a QA breakdown. Mr. Stanley responded that such a failure would not be a QA breakdown regardless of how many times it occurred, but only that it would be more efficient to provide vendors with such guidance. Tr. 13237-40 (Stanley).

VIII.100. Finally, the Bechtel witnesses explained that Quadrex's concern regarding B&R review of work performed by subcontractors and vendors did not indicate a significant breakdown in the QA program for STP. Review of work performed by vendors and subcontractors is encompassed within the scope of Criterion VII of Appendix B, which requires that measures be established to assure that purchased services conform to procurement documents. Criterion VII does not identify which measures must be used to assure that purchased services conform to procurement documents, but instead allows the purchaser to select the measures it deems appropriate. Typically, purchasers confirm the adequacy of the activities of their suppliers by conducting reviews of selected procedures, audits, surveillances, and

reviews at vendor shops and inspections of products upon delivery. Criterion VII does not require a purchaser to verify (in the sense of a detailed check or design review) work performed by subcontractors and vendors. In many cases, it would not be possible for a purchaser to verify the work performed by a subcontractor or vendor. Subcontractors or vendors often possess specialized knowledge and abilities which are necessary for verification but are lacked by the purchaser (which may be the very reason why the purchaser did not perform the design activities itself). Similarly, neither Criterion VII nor Appendix B in general requires that a purchaser review and approve the analysis methods used by subcontractors and vendors, and a purchaser may use other methods (such as audits, surveillances, and reviews of objective evidence of conformance) to assure that purchased services conform with procurement documents. Finally, B&R did have a documented procedure governing the reviews of vendor reports, which required that such reviews include a determination of whether the vendor has met the requirements of the procurement documents. This procedure was sufficient to satisfy the requirements of Appendix B. Bernsen/Lopez, ff. Tr. 13441, at 36-39, 41-42, 42-43.

VIII.101. Other witnesses arrived at similar conclusions. Mr. Taylor testified that, under ANSI N-45.2.11, each engineering organization is responsible for the quality of its own work, and that Appendix B does not require the A/E to review the design work of other design organizations. In fact, most

A/E's do not have the in-house expertise needed to effectively review the designs of a Nuclear Steam Supply System vendor and some other vendors. Thus, the concern raised by Quadrex does not represent a violation of Appendix B. Taylor, ff. Tr. 14846, at 8-9.

VIII.102. Many questions were asked by CCANP and the Board regarding B&R's review of vendor reports. Mr. Stanley explained that Quadrex looked at the review comments provided by B&R on vendor reports from the standpoint of the technical depth, technical content, and thoughtfulness of the comments, and that Quadrex found some reports that were very thoughtfully reviewed and others that were superficially reviewed by B&R. Tr. 13293-95 (Stanley). The Bechtel witnesses testified that the Quadrex Report did not identify significant deficiencies in the work performed by subcontractors, and the variation in the depth of the review of vendor reports by B&R did not indicate a significant QA breakdown in the process of vendor report reviews. Bernsen/Lopez, ff. Tr. 13441, at 39; Tr. 13625 (Lopez). More specifically, the Bechtel witnesses explained that the questions cited by Quadrex in support of finding 3.1(b) involved vendor reports for which a review had not been completed or vendor reports that had been reviewed in the normal engineering fashion at a previous time but which were subject to a re-review by B&R after industry standards changed. Tr. 13877-82 (Bernsen). As a

result, this finding was not indicative of a breakdown in the process of reviewing vendor reports for conformance with procurement documents. Tr. 14050-53 (Bernsen).

VIII.103. In particular, in Question M-49, Quadrex stated that B&R's review of a vendor stress report for a Hills-McCanna butterfly valve was "seriously deficient" (emphasis in original). CCANP and the Board questioned whether this assessment by Quadrex should have led HL&P to notify the NRC of a potentially reportable deficiency. The Bechtel witnesses explained that this matter could not be considered potentially reportable unless additional information was developed which demonstrated that a deficiency actually existed. This information would include the status of the document review and whether the report was preliminary or final. Tr. 13606-07, 13615-17 (Bernsen, Lopez). Upon further consideration, the Bechtel witnesses testified that the vendor report identified in Question M-49 was not a formal submittal, that it apparently was a draft report which was known to be deficient but which was used to decide upon the format and content of formal reports by that vendor, and therefore that no review of this report was conducted which could be considered deficient. Tr. 13814-16 (Bernsen). Furthermore, Dr. Sumpter testified that on May 8, 1981, he knew that this vendor report was still in draft form and that B&R had not completed a review of the report. Sumpter, ff. Tr. 15357, at 2; Tr. 15358-60 (Sumpter).

VIII.104. In sum, the NRC Staff testified that finding 3.1(b) did not identify violations in the QA program, and that the finding was not reportable. Taylor, ff. Tr. 14846, at 9-10. The Bechtel witnesses testified to the same effect. Bernsen/Lopez, ff. Tr. 13441, at 30-43. Another review of the Quadrex Report by the Staff also concluded that this finding was not reportable. Staff Exh. 136 at 23, 405. CCANP adduced no evidence to the contrary.

VIII.105. The Board finds that finding 3.1(b) did not identify a significant breakdown in any portion of the QA program for STP. Although the Quadrex Report identified some calculational errors, the number and significance of these errors was not sufficient to indicate a significant QA breakdown. Furthermore, there is no requirement under Appendix B that the recipient of input data review the data for reasonableness, that the supplier of output data review how the recipient uses that data, or that a purchaser provide a vendor or subcontractor with the type of detailed guidance identified by Quadrex (although it may be good practice to perform these activities when feasible). Finally, there is no requirement in Appendix B that a purchaser verify the design work performed by a supplier, and the information in the Quadrex Report was not sufficient to indicate a significant breakdown in B&R's review of vendor reports. Consequently, the Board concludes that this finding was not reportable or potentially reportable.

Finding 3.1(c)

VIII.106. Finding 3.1(c) primarily expresses three Quadrex concerns: (1) that there was a lack of consistent treatment of plant operating modes and environmental conditions and an absence of written design bases to guide designers in what combination of events and plant modes must be considered; (2) that the design criteria for STP appeared to reflect industry issues in the 1973-75 time frame but not more recent issues; and (3) that analyses of certain systems did not reflect appropriate plant operating modes and environmental conditions. See Bernsen/Lopez, ff. Tr. 13441, at 43-44. See also App. Exh. 60 at 3-4 and 3-5.

VIII.107. The Bechtel witnesses explained that the first concern appeared to be predicated upon a lack of project-wide documented basis for plant operating modes and environmental conditions and their use. They further explained that Appendix B does not require that plant operating and environmental conditions be specified in a project-wide document, that the design bases (including those for off-normal and post-accident conditions) at STP were provided for individual systems or disciplines by System Design Descriptions (SDDs) and Technical Reference Documents (TRDs), and that this practice was sufficient to satisfy the requirements of Appendix B in general and of Criteria III and V in particular. Bernsen/Lopez, ff. Tr. 13441, at 44-45, 47-48.

VIII.108. With respect to the second concern, Mr. Taylor explained that the NRC does not in general require a continual upgrading of the design bases for a plant after the construction permit has been issued. Taylor, ff. Tr. 14846, at 11. Additionally, the Bechtel witnesses testified that B&R was reviewing regulatory and industry developments since 1975, but that in some cases B&R had not yet performed the work necessary to revise its design criteria. Thus, Quadrex's observation that the design criteria did not account for more recent developments did not indicate that the controls provided by the QA program were not being properly implemented but instead indicated that B&R had not yet updated its design criteria -- which at most could be considered a productivity and scheduling concern. Bernsen/Lopez, ff. Tr. 13441, at 45, 48-49.

VIII.109. Finally, the Bechtel witnesses explained that Quadrex's concern that the analyses of certain systems did not reflect appropriate plant operating modes and environmental conditions was based upon three examples. First, Quadrex pointed to deficiencies in the design basis for the HVAC system. These deficiencies were reported to the NRC pursuant to 10 C.F.R. § 50.55(e). The other examples involved a purported failure to consider the worst case conditions (i.e., simultaneous shutdown of two units) in the assumptions used in the design of the Essential Cooling Pond (ECP) and the absence of postulated line cracks and breaks outside of containment. However, the design of the ECP did in fact consider the simultaneous shutdown of two

units, as reflected in FSAR Section 9.2.5, and B&R had not yet begun design activities associated with line cracks and breaks outside of containment. Thus, with the exception of the HVAC deficiency, these examples did not suggest any systematic deficiency in the controls provided by the QA program or in the implementation of those controls and therefore did not indicate the existence of a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 46-47. Although, based on the limited information he reviewed, Mr. Taylor believed that one of the matters involving the ECP might be potentially reportable, 1/ he also concluded that these errors, "if indeed these were errors at all", did not stem from the same root cause and therefore were not indicative of a significant QA program breakdown. Taylor, ff. Tr. 14846, at 12-13.

VIII.110. In sum, the NRC Staff testified that finding 3.1(c) did not identify a significant breakdown in any portion of the QA program for STP and was not reportable or potentially reportable. Taylor, ff. Tr. 14846, at 13-15. The Bechtel witnesses reached the same conclusion. Bernsen/Lopez, ff. Tr. 13441, at 43-49. A separate review of the Quadrex Report by the NRC Staff also concluded that this finding was not reportable. Staff Exh. 136 at 23, 405. CCANP adduced no evidence to the contrary.

1/ We explain with respect to finding 4.6.2.1(n) that additional information, not available to Mr. Taylor, indicated there was no error regarding the ECP calculations.

VIII.111. The Board finds that B&R utilized acceptable means of specifying plant operation modes and environmental conditions and that B&R was not required under Appendix B to utilize a project-wide document for specifying plant operating modes and environmental conditions, that the failure to update design criteria was not a deficiency but only an activity that had not yet been performed, and that the examples cited in finding 3.1(c) did not indicate a significant breakdown in any portion of the QA program for STP. Consequently, the Board finds that finding 3.1(c) was not reportable or potentially reportable.

Finding 3.1(d)

VIII.112. Finding 3.1(d) states that design activities that affected plant safety were, in several instances, not designated as safety-related. See Bernsen/Lopez, ff. Tr. 13441, at 49. See also App. Exh. 60 at 3-5 and 3-6.

VIII.113. The Bechtel witnesses explained in detail why Quadrex's concern with respect to the classification of safety-related activities did not identify a significant breakdown in the QA program for STP, reviewing each of the seven examples that Quadrex cited in support of its concern:

- o The first example, regarding analysis of postulated breaks in high energy lines in the Mechanical Auxiliary Building, did not involve an improper classification but rather an activity which had not yet been performed. Bernsen/Lopez, ff. Tr. 13441, at 50.

o The second example involved the classification of shielding calculations. Although the NRC was notified that this was potentially reportable, HL&P later determined that shielding calculations were not generally classified as safety-related in the industry.

Id. The second example also involved the classification of calculations regarding hydrogen concentrations in the battery room. (See App. Exh. 60 finding 4.6.2.1(o) at 4-61, and Question N-25). On cross-examination by CCANP, the Bechtel witnesses explained that the classification of this calculation was judgmental, that the system had a large margin of safety, and that this item in conjunction with the other examples did not indicate a classification problem beyond the HVAC area. Tr. 13984-88 (Bernsen, Lopez).

o The third example involved Quadrex's concern that B&R had not provided safety-related HVAC systems to account for off-normal conditions. This was reported to the NRC pursuant to 10 C.F.R. § 50.55(e). Bernsen/Lopez, ff. Tr. 13441, at 50.

o The fourth example involved Quadrex's concern that users of computer codes could not determine whether the codes were safety-related because some computer program verification reports (CPVR) were not in place. This was also reported to the NRC pursuant to 10 C.F.R.

§ 50.55(e). Id., at 51. However, this concern did not involve a classification problem. Tr. 14006 (Bernsen, Lopez); Tr. 14703 (Robertson).

o The fifth example involved Quadrex's concerns about various types of analyses for support systems which had not yet been completed or which Quadrex believed may have contained errors. This example did not indicate any problem with classifications (except for the previously mentioned HVAC problem).

Bernsen/Lopez, ff. Tr. 13441, at 51.

o The sixth example involved Quadrex's concern that environmental conditions at remote panels may not have been properly accounted for. This example did not indicate any problem with classifications (except as related to the HVAC problem) but instead pertained to activities which had not been completed by B&R. Id., at 51-52.

o The final example involved Quadrex's concerns regarding systems interaction analyses. With the exception of Quadrex's questions with respect to the classification of the leak detection instrumentation and sump pumps in the Essential Cooling Water pump rooms, these concerns did not involve classification problems but instead concerns about the adequacy of certain analyses or concerns about analyses which had not yet been completed. Id., at 52. The Bechtel

witnesses explained that, based upon their review of documents which existed at the time of the Quadrex review, the leak detection system and sump pumps in the Essential Cooling Water pump rooms were not required to have been classified as safety-related. Tr. 13476-78 (Bernsen, Lopez).

VIII.114. In addition to the seven examples listed in finding 3.1(d), Mr. Stanley stated during cross-examination that finding 4.5.5.1(d) also formed part of the basis for finding 3.1(d). Tr. 13189-91 (Stanley). This finding, and the question on which it is based, states that the calculation to size the ventilation stack for the main steam safety relief valve was not treated as a safety-related calculation. App. Exh. 60 at 4-51 and Question M-47. The Bechtel witnesses explained that the ventilation stack of the main steam safety relief valve was not a safety-related component and therefore that the calculation for sizing the ventilation stack was not required to be safety-related. Tr. 13499-503 (Lopez). B&R arrived at a similar conclusion in its May 8, 1981, assessment. App. Exh. 62, Enc. (1) at Item 4.5.5.1(d).

VIII.115. In sum, of the seven examples, only one (related to the HVAC system) involved a safety-related design activity that was not properly classified as safety-related. The other examples included activities which were properly classified as not being safety-related, analyses which had not yet been completed, and concerns about the adequacy of certain analyses.

The isolated case involving the classification of portions of the HVAC system did not indicate a significant breakdown in the classification system for STP, and it was in fact reported to the NRC by HL&P pursuant to 10 C.F.R. § 50.55(e). Bernsen/Lopez, ff. Tr. 13441, at 50-53; Tr. 13475-78 (Lopez). See also Tr. 13499-503 (Lopez).

VIII.116. Although only one of the seven examples correctly identified an activity which was not properly classified, the HL&P review team did notify the NRC of potentially reportable deficiencies with respect to matters encompassed within three of the examples cited by Quadrex. CCANP questioned whether this fact alone would lead the Bechtel witnesses to notify the NRC of a generic problem regarding classification of safety-related activities. The Bechtel witnesses explained that (with the exception of the HVAC deficiency) the Quadrex examples, including the other potentially reportable deficiencies, did not involve misclassification and did not support the conclusion that there was a generic classification problem. Therefore, it would not have been appropriate to notify the NRC of a generic classification problem based upon these examples. Tr. 13993-96 (Bernsen, Lopez). The Board then questioned how HL&P could have made this determination on May 8, 1981. The Bechtel witnesses explained that the HL&P review team's review of the discipline findings would not have identified a long list of classification problems. In short, if the seven examples in finding 3.1(d) are broken down into individual findings and analyzed, misclassifica-

tion would not be the root cause of these examples (with the exception of HVAC). Therefore, it would not have been appropriate for HL&P to notify the NRC of a potentially reportable deficiency regarding misclassification. Tr. 13997-4003 (Bernsen, Lopez).

VIII.117. CCANP agreed that many of the concerns cited in one of Quadrex's examples did not appear to deal with classification problems at all. CCANP suggested to the Bechtel witnesses that Quadrex's examples were not an attempt to deal with misclassification but instead were an attempt to state that B&R was not adequately addressing safety-related design activities. The Bechtel witnesses rejected that suggestion based upon the context in which the seven examples appeared and upon the fact that acceptance of CCANP's suggestion would essentially mean that every concern dealing with a safety-related activity should have been encompassed within this finding. Tr. 13978-84 (Bernsen, Lopez). Furthermore, in response to a similar line of questioning by CCANP, Mr. Robertson testified that he did not see any "common thread" with respect to the three potentially reportable items that would indicate that B&R was not taking a technically adequate approach to safety-related design activities. Tr. 14699-704 (Robertson).

VIII.118. The NRC Staff also reviewed Quadrex finding 3.1(d) and concluded that it was not potentially reportable. Mr. Taylor first noted that NRC does not require the application of Appendix B to areas other than those that have a direct impact on

safety or are required to be designed and built to protect and support the safety-related functions. The licensee includes in the SAR a list of safety-related structures, systems and components and review of this list is part of the NRC review of the application. Taylor, ff. Tr. 14846, at 16-17. Thus, as a general matter, the NRC reviews in detail the licensee's classifications. The Staff reviewed the seven Quadrex examples and found that the examples that were reportable had been reported and that the remainder neither individually nor collectively constituted reportable items. Taylor, ff. Tr. 14846, at 17-18.

VIII.119. In sum, the NRC Staff testified that finding 3.1(d) was not reportable, and the Bechtel witnesses explained that this finding did not identify a significant breakdown in any portion of the QA program for STP. Taylor, ff. Tr. 14846, at 18; Bernsen/Lopez, ff. Tr. 13441, at 49-55. A separate review of the Quadrex Report prepared by the Staff also concluded that this finding was not reportable. See Staff Exh. 136 at 23, 405. CCANP adduced no evidence to the contrary.

VIII.120. The Board finds that finding 3.1(d) did not identify a significant breakdown in the classification process at STP. The problem with misclassification of safety-related activities was confined to the HVAC deficiency which was reported to the NRC. Consequently, the Board concludes that finding 3.1(d) was not separately reportable or potentially reportable.

VIII.121. In addition to the concern discussed above, finding 3.1(d) also states that B&R used a sharp distinction between safety-related and non-safety-related categorizations, and that designs not classified as safety-related were not subject to design verification. Mr. Taylor and Bechtel witnesses explained that drawing a sharp distinction between these categories and failing to verify calculations not classified as safety-related is not a violation of Appendix B to 10 C.F.R. Part 50, because Appendix B only applies to safety-related activities. Bernsen/Lopez, ff. Tr. 13441, at 53-55; Taylor, ff. Tr. 14846, at 16-17. Finally, finding 3.1(d) states that B&R personnel frequently mentioned that only NRC requirements must be met. However, as Mr. Stanley explained, this statement had no safety significance, but was only intended to point out to H&P that the design may not have been optimal and the most economic. Tr. 13241-45 (Stanley). Consequently, the Board finds that neither of these statements identified a safety or quality concern and that neither would be reportable or potentially reportable under 10 C.F.R. § 50.55(e).

Finding 3.1(e)

VIII.122. Finding 3.1(e) states that written guidelines do not exist for the conduct of failure modes and effect analysis (FMEA) and that there is no documented evidence to

demonstrate that the single failure criterion is met. See Bernsen/Lopez, ff. Tr. 13441, at 55. See also App. Exh. 60 at 3-7.

VIII.123. The Bechtel witnesses testified that B&R had not begun to perform FMEAs for key systems (except for preparation of tables on single failures in the FSAR), and consequently that documented guidance for performance of FMEAs was not yet needed. Furthermore, they explained that the type of project-wide guidance identified by Quadrex for the conduct of FMEAs is not required by Appendix B in general, nor by Criteria III or V in particular, as long as each discipline or group uses appropriate guidance for its specific type of work. Similarly, they explained that it is not necessary to prepare documents solely for the purpose of demonstrating that the single failure criterion is met, provided that this can be determined from other documentation. Bernsen/Lopez, ff. Tr. 13441, at 56, 57. Mr. Taylor also testified that the type of guidance and documentation identified by Quadrex is not required by Appendix B. Taylor, ff. Tr. 14846, at 20-21.

VIII.124. Additionally, finding 3.1(e) identifies one case, involving the common instrument air line, which Quadrex indicated was a violation of the single failure criterion. The Bechtel witnesses testified that nothing in the Quadrex Report indicated that the situation involving the common instrument air

line was attributable or related to a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 56-57.

VIII.125. During cross-examination by CCANP, Mr. Stanley stated that one of the basis for finding 3.1(e) was that Quadrex had asked four of B&R's disciplines for a list of postulated single failures and that Quadrex was not provided with such a list. Tr. 13216-18, 13338 (Stanley). However, when CCANP questioned the Bechtel witnesses with respect to this matter, they explained that there were single failure analyses presented in the FSAR, that the SDDs did identify the single failures and abnormal events that needed to be analyzed, and that B&R had not yet begun the more sophisticated analyses for failure modes and affects and single failures. Tr. 13551-55 (Bernsen, Lopez).

VIII.126. In sum, the NRC Staff testified that finding 3.1(e) did not identify a significant breakdown in any portion of the QA program for STP and was not reportable. Taylor, ff. Tr. 14846, at 21. The Bechtel witnesses testified to the same effect. Bernsen/Lopez, ff. Tr. 13441, at 55-58. A separate review of the Quadrex Report by the Staff also concluded that this finding was not reportable. See Staff Exh. 136 at 23, 405. CCANP adduced no evidence to the contrary.

VIII.127. The Board finds that the type of guidance and documentation identified by Quadrex for the performance of FMEA's is not a regulatory requirement, and that the design of the common instrument air line did not indicate a significant

breakdown in any portion of the QA program for STP. Consequently, the Board concludes that finding 3.1(e) was not reportable or potentially reportable.

VIII.128. Finding 3.1(f)

Finding 3.1(f) primarily involves the concerns that there was no documented evidence for assuring that commitments in the FSAR were being systematically implemented, that there were inconsistencies between the FSAR and design documents, and that there did not appear to be any method to assure the timely updating of the FSAR. See Bernsen/Lopez, ff. Tr. 13441, at 58. See also App. Exh. 60 at 3-7 and 3-8.

VIII.129. The Bechtel witnesses testified that B&R did have methods to assure that FSAR commitments were implemented. These consisted of measures such as a review and comment process for issuance of design documents, a design review by the SDAG, and confirmation that the designs satisfied FSAR commitments through design verification. Furthermore, by looking at the relevant Quadrex discipline findings and questions cited therein, the Bechtel witnesses could not find support for Quadrex's statement that there was no documented method for assuring that FSAR commitments were being systematically implemented. Bernsen/Lopez, ff. Tr. 13441 at 58-60, 64.

VIII.130. The Bechtel witnesses also explained why Quadrex's concern regarding the existence of inconsistencies between design and the FSAR did not indicate a significant breakdown in the QA program for STP. In the construction of many

nuclear projects, such as STP, the FSAR is not used to control design activities but instead is used to summarize pertinent information in the design documents which govern the design activities. As the design evolves, the FSAR is amended periodically to reflect this evolution. Since there is inevitably some delay between the time that the design is changed and the FSAR is amended, it is not unusual for some inconsistencies to exist between the design and the FSAR. These inconsistencies do not pose a significant quality problem as long as they are identified and controlled, and B&R had an appropriate procedure for identifying and controlling these types of inconsistencies. Id., at 60-61, 63-64.

VIII.131. The Bechtel witnesses also explained why Quadrex's concern that there was no method to assure the timely updating of the FSAR did not indicate a significant breakdown in the QA program for STP. Not updating the FSAR in a timely manner may result in inconsistencies between the FSAR and the design documents. As is discussed above, these inconsistencies do not pose a significant quality problem as long as the entire process is controlled, and B&R had a procedure for controlling this process. In particular, Criterion VI (which was cited by CCANP with respect to this finding) does not require the FSAR to be updated nor does it prohibit inconsistencies between the FSAR and other documents as long as the inconsistencies are controlled. However, the Bechtel witnesses also recognized that, even though

not required by Appendix B, timely updating of the FSAR is important in order to provide the NRC Staff with proper information for the conduct of its functions. Id., at 61-63.

VIII.132. Finally, the Bechtel witnesses noted that this finding was not reportable because it did not identify a condition which, if left uncorrected, could have adversely affected the safety of operations. The instances where Quadrex identified an inconsistency between the design and the FSAR generally involved a design or design practice which was technically adequate. Id., at 65. Therefore, the inconsistencies posed no safety concern that would be reportable under 10 C.F.R. § 50.55(e).

VIII.133. Testimony by Mr. Taylor and Mr. Stanley corroborated the testimony by the Bechtel witnesses. Mr. Stanley expressed the opinion that the FSAR should not be used as a design document during construction because of the thousands of amendments that would be required to keep it up-to-date. Tr. 13245-47 (Stanley). Mr. Taylor similarly stated that it would not be practical to keep the FSAR up-to-date because of the thousands of amendments that would be required, and typically licensees will accumulate changes to the FSAR over a period of months before submitting an FSAR amendment. As a result, Mr. Taylor stated that a failure to keep the FSAR up to date would not, in general, be a violation of Appendix B. Taylor, ff. Tr. 14846, at 23-24.

VIII.134. In sum, Mr. Taylor concluded that he could not have expected HL&P to have reported finding 3.1(f). Taylor, ff. Tr. at 14846, at 24-25. The Bechtel witnesses also explained that this finding did not identify a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 65. A separate review of the Quadrex Report by the NRC Staff also concluded that this finding was not reportable. See Staff Exh. 136 at 23, 405. CCANP adduced no evidence to the contrary.

VIII.135. The Board finds that B&R had a systematic method for assuring that FSAR commitments were satisfied, and that not keeping the FSAR up-to-date and the inconsistencies between the FSAR and the design did not indicate a significant breakdown in a portion of the QA program for STP. Consequently, the Board concludes that finding 3.1(f) was not reportable or potentially reportable.

Finding 3.1(g)

VIII.136. Finding 3.1(g) primarily expresses Quadrex's concern that there was very little evidence of a well-thought-out and consistent basis for design, that much of the plant design basis was solely rooted in engineering judgment, and that the rationale for this judgment was not documented in a retrievable manner. Quadrex provided several observations in support of its concern. These included observations that much of the design was based upon unverified preliminary data; that a number of key front-end criteria documents had not yet been prepared; that

significant quality variations were observed in the design review comments for internal documents; that the B&R Materials Group did not review subcontractor material selections; that work performed by one contractor was not being reviewed by other contractors; that design details were obtained from other plants without confirming their applicability to STP; that B&R did not have a consistent requirement for design margins and allowed individual engineers to make this determination; and that B&R did not require the use of either design manuals that provide guidance on acceptable practices or individual engineer log-books. See Bernsen/Lopez, ff. Tr. 13441, at 65-68. See also App. Exh. 60 at 3-8 through 3-10.

VIII.137. Bechtel witnesses explained that Quadrex's concern did not identify a significant breakdown in any portion of the QA program for STP. When read in context, it appears to have been Quadrex's concern that each discipline was establishing its own design basis, that much of the design bases were rooted solely in engineering judgment, and that because the rationale for this judgment was not documented, new Project personnel were not familiar with the reasons why their predecessors had selected certain design bases. However, it is acceptable for each discipline to develop its own design basis rather than relying upon a project-wide document or multi-disciplinary guidance. Furthermore, use of engineering judgment in development of the design basis is appropriate, and the rationale for that judgment need not be documented as long as the design basis itself is docu-

mented. Bernsen/Lopez, ff. Tr. 13441, at 66-70. As the Bechtel witnesses explained in response to questions from the Board, Appendix B does not require documentation of the basis for selecting the design criteria which form the starting points for the design process (though it does require documentation of the assumptions used in developing calculation and analyses based on the design criteria). Tr. 14011-15 (Bernsen).

VIII.138. The Bechtel witnesses also explained (Bernsen/ Lopez, ff. Tr. 13441, at 66-76) that the examples provided by Quadrex in finding 3.1(g) did not identify a significant breakdown in any portion of the QA program for STP:

- o Basing the design upon unverified preliminary data is generally necessary at the start of design and does not identify any quality assurance problems. Quadrex's concern in this area generally pertained to the over-conservatism incorporated in this data. Id., at 67.

- o While it may have been desirable for B&R to have produced the key front-end criteria documents mentioned by Quadrex, many of these documents were not yet needed at that time given the status of design. Moreover, many plants have been successfully completed without using these types of documents in the design process. Id., at 67-68.

- o Presumably, the statement that "quality variations" were observed in design review comments meant that some comments were not as thoughtful as others.

The finding was not intended to identify a deficiency in the comments or in any QA control measures required by Appendix B. Id., at 69-70.

o The absence of a review of subcontractor materials selections by the B&R Materials Group did not violate Appendix B. First, this group was not required by procedure to conduct such reviews. Moreover, the absence of a review of the materials selections of its subcontractors by the B&R Materials Group does not mean that the materials selections were going unreviewed. Criterion III requires that these selections be reviewed and verified. Review and verification by the subcontractors (whose overall QA Program was audited by B&R) satisfies the requirements of Appendix B and assures that the materials selection is appropriate. Id., at 74-76.

o The statement that design details from other plants were used without confirming their applicability at STP appears to be based upon Quadrex's assessment of B&R response to Questions P-2 and M-28. Quadrex's assessment in P-2 explicitly states that reliance upon information provided by Westinghouse is "probably satisfactory" but that B&R "should be more involved in understanding similar plant operating experiences" to assure that components have adequate duty cycle life. Similarly, in its assessment of B&R's response to

Question M-28, Quadrex observed that B&R had directly used Westinghouse plant design events without review for plant availability or economic considerations. Thus, Quadrex's concern in this area did not appear to be related to safety but instead related to matters of plant availability. Id. at 70-71.

o Appendix B does not require that design assumptions (including the design margins) be consistent from discipline to discipline, nor does it require that one contractor review the work of other contractors, provided there is a review to assure conformance with the procurement documents and compatibility at interfaces. Id. at 68. Additionally, on cross-examination, Mr. Stanley confirmed that, although B&R did not use a specific factor to ensure adequate design margins, B&R achieved sufficient conservatism in its design through other means. Tr. 13129-33 (Stanley).

o Provided that other acceptable means of identifying the design input and assumptions are used in preparing a design, there is no requirement that design manuals be prepared to provide uniform guidance to disciplines or designers or that designers use "individual engineer log-books." B&R in fact treated its collection of SDDs and TRDs as a design manual and had a procedure (STP-SD-001) to this effect. Bernsen/Lopez, ff. Tr. 13441, at 68. Additionally, in response to

questions from the Board, the Bechtel witnesses testified that log-books are not used to any great extent by A/Es, that B&R required its engineers to document assumptions, calculations, and input, and that B&R's actions in this regard were consistent with good industry practice. Tr. 14009-11, 14013-14 (Bernsen, Lopez).

VIII.139. The NRC Staff reviewed each of the sub-items of Quadrex finding 3.1(g) and concluded that rather than representing one generic item, it appeared to be a collection of ten "more-or-less separate issues." The Staff concluded that the Quadrex Report contains little or no support for any of the ten sub-items and that neither the overall Quadrex finding nor any of the sub-items was reportable or potentially reportable. Taylor, ff. Tr. 14846, at 25-28.

VIII.140. In sum, the NRC Staff testified that finding 3.1(g) did not identify a significant breakdown in any portion of the QA program for STP and was not reportable. Taylor, ff. Tr. 14846, at 28. The Bechtel witnesses explained in detail why this finding was not reportable or potentially reportable. Bernsen/Lopez, ff. Tr. 13441, at 65-76. A separate review of the Quadrex Report by the Staff also concluded that this finding was not reportable. See Staff Exh. 136 at 23, 405. CCANP adduced no evidence to the contrary.

VIII.141. The Board finds that finding 3.1(g) did not identify a significant breakdown in any portion of the QA program for STP. Consequently, the Board concludes that this finding was not reportable or potentially reportable.

Finding 3.1(h)

VIII.142. Finding 3.1(h) primarily involves a Quadrex concern that specific reliability requirements have not been established for equipment. See Bernsen/Lopez, ff. Tr. 13441, at 76. See also App. Exh. 60 at 3-11.

VIII.143. Both Mr. Taylor and the Bechtel witnesses testified that this finding did not identify any violation of Appendix B or a deficiency in QA. The Bechtel witnesses explained that Appendix B in general (and Criteria I and II in particular) does not require that procurement documents for equipment specify reliability requirements, and it is not general industry practice to do so. Instead, it was the practice of B&R (which was consistent with industry practice) to specify a level of quality consistent with the intended function of the equipment, to rely on historical data and experience, and to perform qualification tests or analysis. Bernsen/Lopez, ff. Tr. 13441, at 76-78. Similarly, Mr. Taylor explained that the NRC utilizes the dual concepts of relative freedom from the probability of single failure plus redundancy, in lieu of specification of reliability requirements (except for diesel generators). Taylor, ff. Tr. 14846, at 29-30.

VIII.144. As a result, the Bechtel witnesses concluded that finding 3.1(h) does not identify a significant breakdown in any portion of the QA program for STP, and Mr. Taylor concluded that he would not have expected this finding to be reported since it did not involve a deficiency. Bernsen/Lopez, ff. Tr. 13441, at 76-78; Taylor, ff. Tr. 14846, at 30. A separate review of the Quadrex Report by the NRC Staff also concluded that this finding was not reportable. See Staff Exh. 136 at 23, 405. CCANP adduced no evidence to the contrary.

VIII.145. The Board finds that finding 3.1(h) did not identify a deficiency because the Commission's regulations do not, in general, require the specification of reliability requirements. Consequently, the Board concludes that this finding was not reportable or potentially reportable.

Finding 3.1(i)

VIII.146. Finding 3.1(i) (which mistakenly is designated as 3.1(j) in the Quadrex Report) primarily expresses two Quadrex concerns: (1) that insufficient nuclear-related analyses had been accomplished, that the nuclear related analysis methods and assumptions were much less adequate than the methods used by other disciplines, and that a high error rate was observed in these calculations; and (2) that a large amount of nuclear-related analysis was subcontracted and that the technical guidance provided to the subcontractors and the review of the

subcontracted analyses by B&R did not appear to be adequate. See Bernsen/Lopez, ff. Tr. 13441, at 78-79. See also App. Exh. 60 at 3-11 and 3-12.

VIII.147. The Bechtel witnesses explained that the first concern did not indicate a significant breakdown in any portion of the QA program for STP. The thrust of Quadrex's concern regarding analyses which had not yet been completed was only to indicate a productivity or scheduling problem. Furthermore, the discipline findings did not identify a large number of inadequate calculations and, with the exception of the deficiencies which were reported to the NRC, the findings did not identify any safety-significant deficiencies. For example, some of the "errors" identified by Quadrex related to calculations which were not inadequate at the time they were performed, but which needed to be updated to account for more recent developments. In other cases, where "errors" in calculations were noted by Quadrex, a complete reading of the Quadrex assessment and an understanding of the related circumstances reveals that Quadrex was mostly concerned with the timeliness of certain analyses, the changing regulatory acceptance of certain analytical methods, or the over-conservatism to be found in some calculations. Finally, in other cases, the "inappropriate methods" identified by Quadrex for the most part did not involve actual errors in calculations, but instead consisted of differences between methods used by B&R and its subcontractors, differences between the methods being used and those described in the FSAR, and

differences between the methods being used and those currently being recommended by the NRC Staff. As a result, the Bechtel witnesses concluded that the first portion of finding 3.1(i) did not identify a significant breakdown in any portion of the QA program for STP but only Quadrex's impression that B&R personnel were not as knowledgeable of certain design assumptions or factors as Quadrex believed they should have been.

Bernsen/Lopez, ff. Tr. 13441, at 79-82, 83.

VIII.148. Other witnesses arrived at similar conclusions with respect to this portion of the finding. For example, Mr. Taylor testified that finding 3.1(i) was intended to point out that B&R lacked expertise in the uniquely nuclear areas and that some delays in design and licensing might occur. Taylor, ff. Tr. 14846, at 31-32. Additionally, in response to questions from the Board, Mr. Robertson stated that his first impression was that the Nuclear Analysis group was out of control and producing defective work. However, upon reading the details of the Quadrex Report, Mr. Robertson concluded that the group was not producing a defective product but instead that it had not yet generated the analyses that needed to be done. Tr. 14638-41 (Robertson). Similarly, as discussed with respect to finding 3.1(b), both Mr. Stanley and Mr. Goldberg testified that the Quadrex did not identify many significant errors in calculations and that Quadrex was primarily concerned about the quantity of work completed as opposed to its quality.

VIII.149. In testifying with respect to the second Quadrex concern in finding 3.1(i), the Bechtel witnesses explained that Quadrex's statement that B&R had subcontracted a large amount of nuclear-related analyses did not identify a significant breakdown in any portion of the QA program for STP. Appendix B to 10 C.F.R. Part 50 does not prohibit a licensee from contracting or subcontracting for design work. In fact, Criterion I of Appendix B explicitly authorizes a licensee to delegate the work of establishing and executing the QA program as long as the licensee retains responsibility. For the reasons expressed with respect to finding 3.1(b), the Bechtel witnesses concluded that Quadrex's concern about the technical guidance provided by B&R to subcontractors and vendors and the review of their analyses did not identify a significant breakdown in any portion of the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 82-83, 84.

VIII.150. In sum, the NRC Staff testified that finding 3.1(i) did not identify a significant breakdown in any portion of the QA program for STP and lacked the technical specificity to be reportable. Taylor, ff. Tr. 14846, at 33. The Bechtel witnesses explained that this finding focused primarily on the timeliness of the design work and did not identify a significant breakdown in the QA program for STP. Bernsen/Lopez, ff. Tr. 13441, at 79-85. A separate review of the Quadrex Report by the Staff also concluded that this finding was not reportable. See Staff Exh. 136 at 23, 405. CCANP adduced no evidence to the contrary.

VIII.151. The Board finds that finding 3.1(i) did not identify a significant breakdown in any portion of the QA program for STP but only an observation that B&R did not have the degree of nuclear expertise which Quadrex expected. Consequently, the Board concludes that this finding was not reportable or potentially reportable.

Finding 3.1(j)

VIII.152. Finding 3.1(j) primarily expresses four concerns of Quadrex regarding the design verification process: (1) that B&R's design verification process permitted the use of preliminary data up to the point of fuel loading; (2) that there were no documented standards regarding the minimum qualifications for a design verifier; (3) that the only evidence of a completed design verification was a signature; and (4) that errors were not detected by design verifiers. See Bernsen/Lopez, ff. Tr. 13441, at 85. See also App. Exh. 60 at 3-13.

VIII.153. The Bechtel witnesses explained that B&R's use of preliminary data up to the point of fuel loading did not indicate a quality or safety concern. Appendix B, and in particular Criterion III, does not include specific requirements regarding the timing of verification activities. It is not uncommon to defer final verification of some types of structures, systems, and components until after construction is well underway or in some cases completed. For example, plant structures are often built in accordance with a preliminary design which is

based upon conservative estimates of expected loads. As design and construction of the structure are completed, it becomes possible to determine the actual loads on the structure, and the design of the structure is then verified using these loads. By using a conservative preliminary design subject to later verification, the possibility for design changes to account for final loads is minimized, construction can proceed in a timely manner, and the design is confirmed to be acceptable. Nevertheless, the Bechtel witnesses testified that, when possible, it is good practice to verify a design prior to release for construction or procurement. Additionally, the Bechtel witnesses noted that the B&R's design verification procedure (STP-DC-015) required that preliminary designs be checked prior to release for construction to confirm that the preliminary designs were acceptable based upon the preliminary input then available. Bernsen/Lopez, ff. Tr. 13441, at 85-86.

VIII.154. Other witnesses corroborated that the use of preliminary data up to the point of fuel loading is acceptable under Appendix B but is not the best practice when it is possible to verify a final design earlier during the design process. See, e.g., Goldberg, ff. Tr. 11491, at 41; Tr. 13120-23 (Stanley). On cross-examination by CCANP, Mr. Goldberg explained that using preliminary data up to the point of fuel loading posed a financial risk and a risk that some reportable deficiencies might be uncovered at the time of fuel loading. Tr. 12035-39 (Goldberg). Similarly, Mr. Stanley explained that it is general industry

practice to release designs for construction based upon preliminary data, subject to controls to verify that the final design is conservative. Although Quadrex found the preliminary designs for STP to be conservative, Mr. Stanley nevertheless felt that a policy of using preliminary data up to the point of fuel loading posed an economic risk. Tr. 13120-23 (Stanley). Finally, Mr. Taylor testified that it would be prudent to verify designs prior to construction if possible. However, neither Appendix B nor ANSI Standard N45.2.11 establishes a time in the overall design and construction sequence at which verification must be done. Taylor, ff. Tr. 14846, at 34.

VIII.155. The Bechtel witnesses and Mr. Taylor also explained that the absence of documented standards for the qualifications of design verifiers does not indicate a significant breakdown in any portion of the QA program for STP. As long as the verification is performed by individuals who did not perform the original design and who are competent, appropriately trained, and qualified, Appendix B in general and Criteria I, III, and XVIII in particular do not require that the specific qualifications of a verifier be spelled out in a document. Quadrex itself acknowledged this fact in finding 3.1(j) and stated that B&R's approach (as embodied in procedure STP-DC-015) of having the Discipline Project Engineer select the design verifier from within the discipline "does not violate NRC

requirements." In fact, this approach was consistent with industry practice. Bernsen/Lopez, ff. Tr. 13441, at 87, 89-91; Taylor, ff. Tr. 14846, at 34.

VIII.156. Finally, the Bechtel witnesses explained that Appendix B in general and Criteria I, III, and XVIII in particular do not require the use of design verification checklists and that B&R's procedure for controlling design verifications (which prescribed how the verification should be conducted and what elements should be addressed) was acceptable. Bernsen/Lopez, ff. Tr. 13441, at 88, 89-91. They also explained that Quadrex's statement that errors were not detected by design verifiers was based upon the same question that supported a similar statement in finding 3.1(b) and that, for the same reasons discussed with respect to finding 3.1(b), this statement was not sufficient to indicate that there was a significant breakdown in the QA program for STP. Id. at 88-89.

VIII.157. In sum, the NRC Staff testified that it would have been inappropriate to report finding 3.1(j) to the NRC. Taylor, ff. Tr. 14846, at 35. The Bechtel witnesses also explained that this finding did not identify a significant breakdown in any portion of the QA program for STP and was not reportable. Bernsen/Lopez, ff. Tr. 13441, at 85-91. A separate review of the Quadrex Report by the NRC Staff also concluded that this finding was not reportable. See Staff Exh. 136 at 23, 405. CCANP adduced no evidence to the contrary.

VIII.158. The Board finds that using preliminary data up to the point of fuel loading is an acceptable practice under Appendix B, that Appendix B does not require the establishment of minimum qualifications for design verifiers or the use of design verification checklists, and that the information in the Quadrex Report regarding the existence of calculational errors was not sufficient to indicate a significant breakdown in the design verification process. Consequently, the Board concludes that finding 3.1(j) was not reportable or potentially reportable.

D. Reportability of the Quadrex Report as a Whole

VIII.159. In addition to contending that each of the foregoing generic and discipline findings was reportable, CCANP also contended that the Quadrex Report, as a whole, was reportable (or "potentially reportable") pursuant to 10 C.F.R. § 50.55(e). CCANP Motion for New Quadrex Contentions, at 18-19. This issue was admitted into controversy by our Memorandum and Order of February 26, 1985, LBP 85-6, 21 NRC 447, 462-63. (1985).

VIII.160. Mr. Goldberg and the Bechtel witnesses, for the Applicants, and Messrs. Constable, E. Johnson and Taylor, for the NRC Staff, addressed this contention in their direct testimony. Goldberg, ff. Tr. 11491, at 48-49; Bernsen/Lopez, ff. Tr. 13441, at 107; Johnson and Constable, ff. Tr. 14846, at 8-9; Taylor ff. Tr. 14846, at 52-54. Other witnesses called by Applicants, the NRC Staff and CCANP were questioned on this

issue, including Applicants' witnesses Sumpter, Bernsen, and Lopez; CCANP witness Robertson; and NRC Staff witnesses Phillips and Collins. As discussed below, each of the witnesses testified that they did not view the Quadrex Report as a whole to be reportable pursuant to 10 C.F.R. § 50.55(e).

VIII.161. Mr. Goldberg testified that, in his judgment, the Quadrex Report, as a whole, was not reportable because it did not identify any widespread breakdown in QA or suggest that a significant amount of the safety-related design was flawed. Goldberg, ff. Tr. 11491, at 48-49. He identified two scenarios under which such a report might have been reportable as a whole: if there were a large number of reportable deficiencies, such that taken together they suggested an extensive problem which could not be bounded; or if a limited number of observations projected a broad concern about the engineering practices that could reach into many areas. Tr. 12539-41 (Goldberg). On first reading, Mr. Goldberg felt the Report did suggest such a broad concern. However after closer scrutiny and with the benefit of the detailed review by Mr. Robertson, Dr. Sumpter, and the B&R engineering team, he found that the Report did not present a technical basis for a broad scale indictment of B&R engineering. Tr. 12536-38, 12604-05 (Goldberg).

VIII.162. The NRC Staff witness, Mr. Taylor, also testified that the Quadrex Report as a whole was not reportable. He noted that the primary emphasis of the Report was on the absence of design manuals and other written guidance to design-

ers, and on design development progress less than Quadrex expected. Neither condition would be reportable. Design manuals and written guidance to designers are commonly used, but may be less useful if the designer is working on only one project. In any event there is no requirement that they be used. Lack of progress in design is not a safety significant design deficiency. Taylor, ff. Tr. 14846, at 52-54.

VIII.163. The other witnesses who testified on this point uniformly expressed the opinion that the Quadrex Report was not reportable under 10 C.F.R. § 50.55(e), primarily because it did not reveal a broad scale breakdown in the B&R QA program for design. Tr. 12832-33; 12878-83 (Sumpter); Bernsen/Lopez, ff. Tr. 13441, at 107; Tr. 14022-26 (Bernsen, Lopez); Tr. 14729-36 (Robertson); Johnson and Constable, ff. Tr. 14846, at 8-9; Tr. 15037-39 (Johnson, Constable, Taylor); and Tr. 15159-60 (Phillips). Mr. Collins testified that based on the original descriptions of the Report he received from NRC inspectors, he suggested to HL&P that the Quadrex Report as a whole should be reported pursuant to 10 C.F.R. § 50.55(e). Tr. 15292, 15345-47 (Collins). However, based on the subsequent detailed reviews performed by the NRC Staff, he now believes the Report as a whole was not reportable, and he pointed out that, in reviewing the Report for reportability in 1981, the Applicants had the benefit of more information than did the NRC. Tr. 15347-49 (Collins).

VIII.164. Various witnesses also testified that it would not have been appropriate to submit the entire Quadrex Report to the NRC pursuant to 10 C.F.R. § 50.55(e). Section 50.55(e) states that written reports submitted to the NRC on reportable deficiencies "shall include a description of the deficiency, an analysis of the safety implications and the corrective action taken, and sufficient information to permit analysis and evaluation of the deficiency and of the corrective action taken." As Dr. Sumpter explained, Section 50.55(e) only requires licensees to provide the NRC with information regarding deficiencies and does not require licensees to submit the reports which first identified the deficiencies. Tr. 12832 (Sumpter). Similarly, the Bechtel witnesses explained that the Quadrex Report was not organized or structured in such a manner to address the reporting requirements of Section 50.55(e), and that it would be more appropriate to submit a 50.55(e) report for each individual reportable deficiency. Tr. 14023-26 (Bernsen, Lopez). Furthermore, Mr. Eric Johnson of the NRC Staff testified that the Staff has limited resources and needs to have some threshold for reporting, and that no useful purpose would have been served by submitting the Quadrex Report as a potentially reportable deficiency subject to later withdrawal of those items determined not to be reportable. Tr. 15049-50 (Johnson).

VIII.165. Based on our review of the Quadrex Report, including in particular the generic and discipline findings at issue in this proceeding, we agree with the unanimous testimony

of the witnesses and find that the Report did not identify a broad scale breakdown in the B&R design QA program and that 10 C.F.R. § 50.55(e) did not require Applicants to submit the entire Report to the NRC.

E. Conclusions

VIII.166. The B&R May 8, 1981 assessment of the Quadrex Report reviewed each of the most serious discipline findings for reportability and found one item related to HVAC to be potentially reportable. App. Exh. 62.

VIII.167. The HL&P review team reviewed each of the most serious discipline findings in the Quadrex Report for reportability. In addition to the HVAC item identified in the May 8, 1981, B&R assessment, the HL&P review team found two other items (related to computer code verification and shielding calculations) to be potentially reportable. Goldberg, ff. Tr. 11491, at 23-24, 28, 34-36.

VIII.168. The Bechtel Task Force (BTF) report reviewed all of the discipline findings in the Quadrex Report for reportability. In addition to the items involving HVAC and computer code verification that were identified by the HL&P review team, the BTF report identified one additional matter as being potentially reportable. This matter pertained to an apparent design deficiency in the common instrument air line of the Fuel Handling Building (FHB) HVAC system. App. Exh. 63 at Exhibit B-27. As discussed above with respect to finding 4.3.2.1(a), HL&P notified

the NRC in March 1982 that this design was potentially reportable. However, the design of the common instrument air line had not been released for construction. This fact was not known by the BTF but was known by the HL&P review team. Accordingly, the HL&P review team correctly determined that this item was not potentially reportable.

VIII.169. In December 1982, the NRC Staff issued Inspection Report 82-12 (NUREG-0948) which considered whether each of the generic findings, each of the discipline findings, and the Report as a whole were reportable. With the exception of the items of which HL&P had notified the NRC, the Report as a whole and the findings therein were determined not to be reportable. Staff Exh. 136 at 19-20, 23, and 405.

VIII.170. In August 1984, the NRC Staff issued a report which assessed the reportability of each of the discipline findings in the Quadrex Report. With the exception of the items of which HL&P had notified the NRC, none of the findings were determined to be reportable. App. Exh. 77 at Enclosure.

VIII.171. The prefiled testimony of the Bechtel witnesses reviewed each of the discipline and generic findings at issue in this proceeding and the Quadrex Report as a whole. The Bechtel witnesses concluded that none of these findings identified a significant breakdown in any portion of the QA program for STP beyond that reported by HL&P and concluded that the Report as a whole was not reportable. Bernsen/Lopez, ff. Tr. 13441.

VIII.172. The prefiled testimony of Mr. Taylor of the NRC Staff reviewed each of the discipline and generic findings at issue in this proceeding and the Quadrex Report as a whole. He concluded that neither the Report as a whole nor any of the generic findings were potentially reportable. Additionally, with three exceptions, he did not find any of the discipline findings to be potentially reportable. The three exceptions involved statements by Quadrex that criteria for protection against internal missiles had not been implemented in the design, that analyses of the ECP by different design groups used different temperatures, and that B&R's assumptions for the design of seismic to non-seismic boundary anchors are probably unconservative. Taylor, ff. Tr. 14846. As discussed above with respect to findings 4.1.2.1(b), 4.6.2.1(n), and 4.7.3.1(k), protection against internal missiles represented a future design activity, use of different temperatures by different groups was appropriate because the groups were performing analyses for different purposes, and the design of the boundary anchors had not been released for construction. These facts were known to the HL&P review team but apparently were not known by Mr. Taylor. Consequently, the HL&P review team properly concluded that these matters were not potentially reportable.

VIII.173. None of the documents which CCANP identified for the record and none of the witnesses which CCANP presented concluded that any matters in the Quadrex Report were reportable beyond those reported by HL&P, and none concluded that the Report as a whole was reportable.

VIII.174. In sum, all of the witnesses and documents in the record which addressed the question concluded that neither the Quadrex Report as a whole nor the generic findings were reportable. Similarly, with the exception of four matters, all of the witnesses and documents in the record which addressed the question concluded that none of the discipline findings at issue were reportable in addition to those reported by HL&P on May 8, 1981. With respect to these four matters, the record clearly demonstrates that the HL&P review team had sufficient information to determine that the matters were not potentially reportable, and the conclusions to the contrary which were drawn by others were based on a lack of complete information.

VIII.175. As discussed in the previous three Sub-sections, the Board has concluded as a result of its own analysis of the record that the findings at issue in this proceeding and the Report as a whole were not reportable. Consequently, HL&P did not violate 10 C.F.R. § 50.55(e)(2) by failing to notify the NRC of any of these findings or of the Report.

VIII.176. Since HL&P did not violate 10 C.F.R. § 50.55(e), no adverse conclusions can be drawn regarding its character and competence. Moreover, the testimony by Mr.

Goldberg and the other members of the HL&P review team clearly indicates that they applied appropriate criteria in determining whether any Quadrex-related matters were potentially reportable, that their determinations were correct, and that they conducted their review promptly, conservatively, and in good faith. The Board finds that this reflects favorably upon HL&P's character and competence.

VIII.177. Even if the Board were to conclude that HL&P should have notified the NRC of the Quadrex Report as a whole or of additional matters therein, we would still draw no adverse conclusions with respect to HL&P's character and competence. Numerous witnesses testified, and the I&E Guidance states, that there are no precise criteria for determining whether a matter is reportable and therefore licensees must exercise judgment in determining whether the NRC should be informed of a matter pursuant to 10 C.F.R. § 50.55(e). See, e.g., Goldberg, ff. Tr. 11491, at 26-27; Bernsen/Lopez, ff. Tr. 13441, at 11-13; Heishman, ff. Tr. 14846, at 2; Staff Exh. 137 at 8. The Staff witnesses further explained that the determination of reportability revolves around informed judgment. The Staff does not want to be bogged down with reported trivia because it drains the Staff resources. Accordingly, the Staff witnesses testified that licensees should use judgment and screen matters being reported to the NRC in order to avoid flooding the NRC with too much information. Tr. 15048, 15062-65 (Johnson, Heishman, Constable).

Numerous evaluations of the reportability of the Quadrex Report and its findings by competent individuals have confirmed the reportability determinations made by HL&P. Consequently the Board finds that these determinations have a reasonable basis. Therefore, any disagreement by the Board with HL&P's reportability determinations would represent, at most, a difference in judgment. For example, although Mr. Taylor of the Staff disagreed with three of HL&P's reportability determinations, he recognized that these disagreements pertained to matters which were close calls where his judgment was different from HL&P's. Accordingly, Mr. Taylor did not draw any adverse conclusions about HL&P's character and competence as a result of its failure to report these matters. Taylor, ff. Tr. 14846, at 37-38, 45-46, 49-50. Similarly, the Board finds that, even if it were to reach reportability determinations which are different from those of HL&P, it would not draw any adverse conclusions regarding HL&P's character or competence.

IX. COMPLIANCE WITH MCGUIRE OBLIGATIONS AND HL&P'S CANDOR

A. Timeliness of Providing The Quadrex Report to the Board

IX.1. Contention 10 provides:

The Quadrex Report was relevant and material to issues of character and competence addressed in Phase I of this proceeding and should have been furnished to the Licensing Board and parties shortly after its receipt by HL&P, under obligations imposed by the McGuire line of decisions. Failure to have furnished this Report reflects adversely on the character and competence of the Applicants and on their ability to manage the construction and operation of a nuclear power plant.

IX.2. The Board first requested the views of the parties on whether the Quadrex Report should have been provided to the Board under the McGuire doctrine in its Memorandum and Order, dated June 22, 1983 (unpublished). In its August 24, 1984 Response to Licensing Board Memorandum and Order Regarding the Reportability of the Quadrex Report, the Staff took the position that the Report should have been provided to the Board during the May 1981 Phase I hearings. The Staff characterized the Report as "raising. . . important questions relative to the design work of Brown & Root and the quality control in that design. . . ." Id. at 8. CCANP agreed with both the Staff conclusion on notification to the Board and the Staff characterization of the Quadrex Report. CCANP Brief in Response to Licensing Board Memorandum

and Order Regarding the Requirements Applicable to the Applicants to Notify and Report to the NRC About the Quadrex Report and its Findings, dated October 1, 1984, at 26-28.

IX.3. Applicants, on the other hand, expressed the view that the McGuire doctrine was not violated, maintaining that the issues and contentions in Phase I related to construction QA and construction activities, that design-related matters were discussed only peripherally in Phase I, and thus, that the design concerns addressed in the Quadrex Report were basically unrelated to the Phase I issues and contentions. Citing the Appeal Board's decision in Pacific Gas and Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-756, 18 NRC 1340, 1346 (1983), Applicants emphasized that the identification of design concerns, or even design QA concerns, in the Quadrex Report would not necessarily suggest any relationship to construction or construction related QA matters. They pointed out that the principal focus of the Report was on the sequence, stage of completion, and B&R management of design activities, and not on design QA. Applicants' Response to NRC Staff Brief, dated September 28, 1984, at 7-14.

IX.4. Upon review of these briefs and the Quadrex Report, we held in our Memorandum and Order dated February 26, 1985, that "the Quadrex Report was relevant and material to matters before the Board [during the Phase I hearings] and, as a matter of law, should have been turned over under the McGuire doctrine shortly after its receipt by HL&P." LBP-85-6, 21 NRC at

461-62. In so holding, we perceived the Report as focusing on design QA, noting that "[c]onstruction and design QA are not so disparate as to be considered unrelated subjects." Id. at 462.

IX.5. At the Phase II hearings, extensive evidence was introduced concerning the purpose of the Quadrex review and the substance and import of the results presented in the Quadrex Report. HL&P witnesses testified that the purpose of the Quadrex review was to ascertain the status of engineering at STP. Sumpter, ff. Tr. 12699, at 5-10; Tr. 12760-61 (Sumpter); Goldberg, ff. Tr. 11491, at 6-7; Tr. 11574-77, 11583-84, 12600-02 (Goldberg); Jordan, ff. Tr. 11908, at 2-4; Tr. 11921-23 (Jordan); Oprea, ff. Tr. 14095, at 2-5; Tr. 14383 (Oprea). Mr. Goldberg, for example, testified that Quadrex was asked to review certain specific areas in which HL&P had reason to believe that B&R might be experiencing difficulty. The assessment was to assist HL&P in benchmarking the status of the Project and to identify opportunities for improving B&R's engineering program. Findings VII.2-3.

IX.6. Mr. Goldberg testified that he did not view the Report as a report on QA. He acknowledged that some quality concerns were noted in the Report, such as the three items that HL&P identified as potentially reportable, but he viewed the Report as focusing on the efficiency of B&R's engineering activities, not its QA program. Goldberg, ff. Tr. 11491, at 55. From HL&P's perspective, the important message of the Quadrex Report was not that the quality of the engineering products or processes were deficient, but rather, that the B&R engineering

organization was weak and unlikely to support the Project without substantial, additional improvement. Goldberg, ff. Tr. 11491, at 21, 55; Tr. 11586, 12604-05 (Goldberg). The Quadrex Report did not identify weaknesses in QA either as administered by the QA Department or within the engineering organization. In fact, the problems in engineering highlighted by Quadrex were not of a type likely to be identified by the QA function. Goldberg, ff. Tr. 11491, at 55; Jordan, ff. Tr. 11908, at 3-4. Dr. Sidney A. Bernsen and Mr. Frank Lopez, Jr. of Bechtel testified that they had reviewed the Report as a whole, as well as its individual findings and that it was "not an analysis of the adequacy of the design QA program for STP. . . ." Bernsen and Lopez, ff. Tr. 13441, at 107.

IX.7. The HL&P witnesses' description of the purposes and results of the Quadrex review were confirmed by Mr. Loren Stanley, the Quadrex Manager responsible for the Report. He testified that the purpose of the Quadrex review was to evaluate B&R's engineering activities as they reflected on B&R's ability to complete the design of STP in an efficient and orderly way. Stanley, ff. Tr. 13047, at 3; Tr. 13073 (Stanley). Mr. Stanley stated that Quadrex was asked to make this evaluation by reviewing B&R's engineering response to selected issues that were known to present difficulties to the nuclear industry. Quadrex was also asked to review certain areas in which HL&P believed that B&R was experiencing problems. Stanley, ff. Tr. 13047, at 3; Tr. 13073-74 (Stanley).

IX.8. Mr. Stanley further testified that the Quadrex Report was intended to convey to HL&P that engineering was not as far advanced as Quadrex would have expected for a plant which had been under design for seven years. Tr. 13082-83 (Stanley). Quadrex noted many areas, (e.g., mechanical, electrical, instrumentation, and piping), where B&R had performed little of the work needed to complete the design, for example, the development of basic design documents. Quadrex did not review B&R's design procedures or QA program for design activities, nor did it assess B&R's compliance with such procedures and program requirements. The purpose of the Quadrex review was not to identify failures of B&R to conform to the requirements of Appendix B to 10 C.F.R. Part 50 in the design process for STP. Stanley, ff. Tr. 13047, at 3-4. Quadrex was not looking at QA, but instead, was trying to take a snapshot of the engineering design and make an assessment of the engineering skills and capabilities of B&R. Tr. 13073 (Stanley). The Report was essentially intended as a management tool. See Goldberg, ff. Tr. 11491, at 4-5.

IX.9. Testimony by NRC Staff witnesses was to the same effect. For example, Mr. Collins testified that although the Staff initially viewed the Quadrex Report as centered around apparent design QA deficiencies, once it was able to completely review the Report it agreed with Applicants that the Report did not focus on QA but rather on problems associated with schedule. Tr. 15350 (Collins). Mr. Taylor perceived the Report as directed at the lack of documented design guidance and at the limited

progress of the design work. Taylor, ff. Tr. 14846, at 52-53. In fact, the Staff witness who reviewed the reportability of the Quadrex findings at issue, as well as the Report as a whole, found no reportable QA deficiencies unreported by HL&P.

IX.10. CCANP did not present any evidence to the contrary, nor did it elicit any testimony from other witnesses to suggest that the Quadrex Report dealt with QA concerns.

IX.11. Two Staff witnesses testified concerning their belief that the Report should have been provided to the Board. Mr. Sells testified that he thought the Board should have received the Report because "there had been some, although limited discussion of Brown & Root engineering" at the Phase I hearings, and because of the generally critical nature of the Report, although much of the criticism was unsubstantiated. Tr. 15223 (Sells). Mr. Collins simply stated, without elaboration, that he thought the Board should receive the Report because "there were matters in there that were under litigation." Mr. Collins had not personally reviewed the Report but had reached his judgment based on information received from Mr. Phillips. Tr. 15342 (Collins). Mr. Phillips never discussed with Mr. Collins, nor with anyone from HL&P, whether the Board should receive the Report. Tr. 15205-6, 15254-55 (Phillips).

IX.12. The NRC Staff's position apparently continues to be that the Quadrex Report should have been provided to the Board. However, Staff counsel acknowledged that it could not identify a specific issue or contention in Phase I to which the

Report was directly relevant. Tr. 10837 (Perlis). The Staff viewed the matter as "a close question," and, though the Report arguably was not relevant to the proceeding, felt that in "a close case" the information should have been submitted. Tr. 10837-39 (Perlis).

IX.13. For Applicants, Mr. Goldberg explained at length why he did not provide the Quadrex Report to the Board upon its receipt in May 1981. He was aware of the obligation to advise the Board of information that could affect its decision regarding matters under its review and he considered whether the Report should be provided to the Board. However, he understood that the Phase I hearings were aimed primarily at construction and construction related QA problems, not design questions. He did not view the limited discussion in his testimony of the HL&P engineering organization and its responsibilities as being a focus of the Phase I hearing. Because the Report did not raise questions with respect to the manner in which construction was performed or the adequacy of construction QA, Mr. Goldberg felt that the Report did not relate to the issues in the licensing hearing, and he did not believe that the Report should be furnished to the Board. Goldberg, ff. Tr. 11491, at 54; Tr. 12616-17 (Goldberg). See also Tr. 12760-67 (Sumpter).

IX.14. Other HL&P witnesses also testified that they did not associate the Quadrex Report with the issues under consideration in the Phase I hearings. For example, Mr. Oprea explained that he knew the matters being considered by the Board

arose from I&E Report 79-19, the Show Cause Order and certain contentions raised by the intervenors. In his mind, however, those matters related to construction or construction QA, neither of which were addressed directly or indirectly by the Report. Oprea, ff. Tr. 14095, at 12; Tr. 14384-85 (Oprea). Similarly, Mr. Jordan explained his understanding that the Phase I proceeding dealt basically with construction and construction QA. Even if he had thought that it dealt with engineering, he understood that the NRC was interested in safety-related matters and not the concerns expressed in the Quadrex Report as to whether B&R was capable of completing the job in a timely and cost-effective way. Jordan, ff. Tr. 11908, at 11. See also Tr. 14737-38 (Robertson).

IX.15. Although HL&P believed that the Quadrex Report was not material to the issues in Phase I, it promptly provided the Report to the Board when urged to do so by Staff attorneys in September 1981. Goldberg, ff. Tr. 11491, at 54-55; cf. Tr. 12675 (Goldberg). The only evidence in the record indicating that HL&P might have been advised to consider notifying this Board of the Report at any earlier time is testimony by Mr. Collins to the effect that during an August 27, 1981 telephone conversation, he suggested to Mr. Oprea that HL&P consider doing so. Tr. 15288, 15341-47 (Collins). Mr. Oprea testified that he did not recall such a suggestion by Mr. Collins, Tr. 14300-04 (Oprea), and that had such a suggestion been made he probably would have consulted with HL&P's licensing attorneys, which he did not do. Tr. 15371-73 (Oprea). The August 27 telephone

conversation was followed by a September 8 briefing of the NRC Region IV Staff conducted by Messrs. Oprea and Goldberg. Goldberg, ff. Tr. 11491, at 53. Mr. Collins apparently did not renew any such suggestion at the September briefing, or at any other time, nor did he follow-up the suggestion in any manner. Tr. 15343 (Collins); Tr. 14404, 15372-73 (Oprea); see CCANP Exh. 140. It appears to us that either Mr. Collins misrecollects the conversation or Mr. Oprea misunderstood him. In any case, the event is not significant, particularly since the Board was notified of the Report on September 28, a reasonable period after any suggestion that may have been made by Mr. Collins.

IX.16. Upon reconsideration of our ruling in LBP-85-6, 21 NRC 447 (1985), the Board finds that the Quadrex Report did not pertain to design QA to any significant degree. Consequently, it is now not apparent to the Board that Applicants violated any McGuire obligations by not furnishing the Quadrex Report to the Board and the parties in May or June, 1981. In any case, we find that HL&P reasonably believed that it was not under any obligation to provide the Report to the Board. Therefore, we conclude that any failure by HL&P to inform the Board of the Quadrex Report earlier than it did would not reflect adversely on its character and competence.

B. Timeliness of Informing the Board of Actions Relating to Replacement of B&R.

IX.17. As mentioned in Finding VI.14, CCANP moved to reopen the Phase I record to receive evidence regarding the timeliness of the replacement of B&R. CCANP claimed that testimony before this Board in Phase I was not accurate, that HL&P did not advise the Board promptly under the McGuire rule of the potential replacement of B&R, and that Applicants' counsel manipulated the timing of the removal of B&R to improperly influence the Phase I hearing. In LBP-85-19, 21 NRC 1707 (1985), we denied CCANP's motion and noted that contention 10 is "broad enough to include not only the reportability of the Quadrex Report but also the replacement of B&R as an outgrowth of the Quadrex Report." 1/ Id. at 1715. Thus, while we denied CCANP's motion and excluded from consideration the timeliness of the actual decision to replace B&R, we did permit a more limited inquiry regarding some of CCANP's claims. We consider those claims in this section.

IX.18. We should note at the outset that the process of replacing B&R was discussed at some length in Phase I testimony. In his June 1982 testimony, Mr. Goldberg explained that by early summer of 1981, HL&P had concluded that B&R lacked the necessary depth of engineering support to perform the engineering

1/ Although it appeared to us that the replacement of B&R was an outgrowth of the Quadrex Report, it is now clear that the Report did not play such a significant role in HL&P's decision to replace B&R. Goldberg, ff. Tr. 11491, at 70-71. See Finding IX.22.

and construction management tasks for STP in an orderly, timely and cost effective manner. HL&P was concerned that B&R's lack of engineering progress was holding back construction, thereby affecting Project costs and scheduling. Goldberg et al., ff. Tr. 10403, at 5-7. Mr. Goldberg had suggested, as early as January 1981, that HL&P explore whether there were alternatives to completing the Project with B&R as A/E but HL&P was at that point unwilling to do so. Tr. 10518-20 (Goldberg). See also, Jordan, ff. Tr. 11908, at 8-9; LBP-84-13, 19 NRC at 780-81 (Finding 224). In the spring of 1981 HL&P, working with B&R, attempted to enhance B&R's capability to complete the Project design. Tr. 10413-17 (Goldberg). 2/ However, at a Management Committee meeting on June 26, 1981, HL&P received information bearing seriously and ominously on the status of the Project and its anticipated progress. That information led HL&P to explore whether there were alternatives to B&R. The decision to do so was taken at a meeting among HL&P officials on June 29, 1981. Jordan, ff. Tr. 11908, at 9-10; Tr. 12176-77 (Jordan); Goldberg, ff. Tr. 11491, at 56; Oprea, ff. Tr. 14095, at 10-11. In July of 1981 HL&P undertook to examine the feasibility of replacing B&R as A/E and construction manager with an organization that had more nuclear experience and resources. It received and evaluated

2/ At that time, B&R was progressing satisfactorily in implementing needed improvements in its construction activities, and, since HL&P's concerns did not extend to B&R's actual construction work, it did not then plan to replace B&R as constructor. Goldberg et al., ff. Tr. 10403, at 5-7; Tr. 10420 (Goldberg).

proposals during August and early September, and determined that Bechtel was the best choice. Tr. 10419 (Goldberg). HL&P was able to reach agreement in principle with Bechtel by September 24, 1981, and promptly informed the Board. Goldberg, ff. Tr. 11491, at 57.

IX.19. During the Phase I proceeding, neither the Board nor any party raised any question concerning the timing of Applicants' notification to the Board of the replacement of B&R or of steps taken in anticipation thereof. Nevertheless, the Board decided to hear additional testimony on this matter in Phase II because CCANP, albeit with almost non-existent support, made some serious accusations in its motion to reopen the record. As we explain below, we find the accusations entirely without merit.

IX.20. In the Phase II hearings, Applicants presented testimony on these subjects by the three HL&P officials who had principal responsibility for the Project during 1981: Mr. Jordan (then President and Chief Executive Officer), Mr. Oprea (then Executive Vice President-Nuclear) and Mr. Goldberg (then Vice President, Nuclear Engineering and Construction). Their testimony expanded upon and fully corroborated the uncontroverted testimony that had been presented by Mr. Goldberg in Phase I.

IX.21. Mr. Goldberg explained that beginning with his appointment in October, 1980, he had a general concern regarding the limited numbers and experience of B&R engineering personnel. In conjunction with the HL&P Engineering staff, he had identified

potential weaknesses in B&R's nuclear analysis capability. These observations caused him to question the strength of B&R's engineering organization. Goldberg, ff. Tr. 11491, at 4. Starting in January of 1981, he suggested to HL&P management on several occasions that it would be prudent for HL&P to explore the marketplace to determine the availability of alternatives for completing the Project without B&R as A/E. Id. at 56-60, 66; Tr. 10518-20 (Goldberg); Jordan, ff. Tr. 11908, at 8; Tr. 11974 (Jordan); Oprea, ff. Tr. 14095, at 21-24. But both Mr. Jordan and Mr. Oprea felt that the first priority and best option was to improve B&R's engineering performance. Oprea, ff. Tr. 14095, at 8-10; Jordan, ff. Tr. 11908, at 8; Tr. 11970-71, 11999-2000 (Jordan). Thus, at an April 10, 1981 meeting of executives of the Project owners with B&R, needed improvements were discussed, including reorganization of engineering functions, recruiting of experienced personnel and employing experienced subcontractors. Goldberg, ff. Tr. 11491, at 59; Tr. 10413-17 (Goldberg); Jordan, ff. Tr. 11908, at 8; Tr. 12003-4 (Jordan). Many of these positive steps were initiated, but when B&R resisted Mr. Goldberg's suggestion that it hire a senior nuclear executive who would report directly to the President of B&R, he urged even more strongly that HL&P ascertain whether an alternative was available. Goldberg, ff. Tr. 11491, at 59-60; Jordan, ff. Tr. 11908, at 8; Tr. 11973-4 (Jordan). However, HL&P management had not yet

reached the judgement that B&R, appropriately strengthened, could not complete the project. See Goldberg, ff. Tr. 11491, at 60; Jordan, ff. Tr. 11908, at 8-9.

IX.22. It was not until the owners of STP met with B&R on June 26, 1981, that they became convinced that B&R would not be able to perform engineering services in a fashion that would support the STP construction schedule and that it would take an extensive period before engineering could achieve the desired level of productivity. Oprea, ff. Tr. 14095, at 10; Jordan, ff. Tr. 11908, at 9; Tr. 11951-52 (Jordan). B&R informed the owners that only nine percent progress could be expected during the subsequent 18 months. Tr. 12004-5, 12147-48 (Jordan); see also CCANP Exh. 79. Mr. Jordan convened a meeting with Messrs. Oprea, Goldberg and Barker on June 29, 1981, and each of them expressed the view that B&R would be unable to complete the engineering for STP in an orderly, timely and cost effective manner. Oprea, ff. Tr. 14095, at 11; Tr. 12010-12, 12177 (Jordan); Tr. 12607 (Goldberg); CCANP Exh. 79. Based on that input, Mr. Jordan decided that HL&P should explore whether there were alternatives to continuing with B&R. Tr. 11970-71 (Jordan); Goldberg, ff. Tr. 114911, at 56; Tr. 12613-14 (Goldberg); see also Jordan, ff. Tr. 11908, at 9-10.

IX.23. On the basis of the extensive testimony and exhibits that were made part of the record, we find that no decision was made to replace B&R before June 29, 1981, and even then, HL&P's decision was only to see if viable alternatives

existed. (Preliminary inquiries in mid-1980 suggested that other A/Es were not interested in undertaking the job. Jordan, ff. Tr. 11908, at 7). Thus there was no information that should have been provided to us before that date 3/ and no violation of the McGuire rule or of any other obligation to inform the NRC, including this Board.

IX.24. CCANP, in its Motion to Reopen the Phase I Record of April 15, 1985, accuses Mr. Oprea of giving "what appears to be misleading testimony to the ASLB in June of 1981 . . .", (Motion at 4), and cites an excerpt from Mr. Goldberg's 1982 Texas PUC testimony in support of this accusation. See CCANP Exh. A to the foregoing Motion to Reopen. In the Texas PUC proceedings, Mr. Goldberg testified that he told Messrs. Oprea and Jordan, prior to June 29, 1981, that it would be prudent for HL&P to explore the market to determine whether an alternative existed for completion of STP engineering should B&R be unable to improve its engineering performance. CCANP claims that this is inconsistent with Mr. Oprea's testimony before the Board on June 2, 1981, (see Tr. 3473 (Oprea)) to the effect that he had not had discussions about the removal of B&R after the Show Cause Order.

IX.25. After hearing testimony from Mr. Goldberg and Mr. Oprea on this alleged inconsistency, we find no conflict. In 1982, after describing to the Board his suggestion to HL&P

3/ We deal in Findings IX.36-47, with the question of whether HL&P officials should have mentioned their concerns with B&R engineering in their 1981 testimony.

management that alternatives to B&R be explored, Mr. Goldberg testified that he did not consider those remarks to amount to a discussion about removal of B&R; and he testified to exactly the same effect in the Phase II hearings. See Tr. 10519 (Goldberg); Goldberg, ff. Tr. 11491, at 67. Mr. Oprea concurred in this conclusion. Oprea, ff. Tr. 14095, at 22-23. Both Mr. Goldberg and Mr. Oprea stated in their Phase II testimony that there were no discussions about removal of B&R until June 29, 1981. Oprea, ff. Tr. 14095, at 23; Goldberg, ff. Tr. 11491, at 66-67.

IX.26. Moreover, HL&P's principal management witnesses (Messrs. Jordan, Oprea, and Goldberg) clearly shared the same perception concerning the nature of discussions among themselves regarding the possibility of B&R's removal. Each testified that discussions prior to June 29, 1981, (with the exception of those growing out of a 1979 review by MAC) reflected a canvassing of options, but that in all such discussions, replacement of B&R was the alternative of last resort -- the option to be considered only after all reasonable means of enhancing B&R's performance had been exhausted. The record is clear that HL&P's principal management witnesses did not seriously discuss replacement of B&R until they concluded during the last part of June, 1981, that notwithstanding all that had been done to assist B&R, its engineering organization could not support completion of the Project in a reasonable time frame. Jordan, ff. Tr. 11908, at 9; Tr. 11974, 12005-06 (Jordan); Goldberg, ff. Tr. 11491, at 56, 66; Oprea, ff. Tr. 14095, at 10-11.

IX.27. Once the decision was made on June 29, 1981 to ascertain whether alternatives were available, events moved quickly. In early July 1981, Mr. Oprea and Mr. Goldberg contacted four prospective contractors who expressed interest in undertaking the completion of STP. Oprea, ff. Tr. 14095, at 11; Tr. 14379 (Oprea); Goldberg, ff. Tr. 11491, at 56; CCANP Exh. 78 at 5. Requests for Proposals (RFP) were sent out in late July. Oprea, ff. Tr. 14095, at 11. Responses were received from Bechtel, Ebasco, Stone and Webster and Westinghouse. The Westinghouse response was eliminated from consideration as non-responsive, and the other three organizations were visited by HL&P representatives during late August and early September to obtain additional information to evaluate their proposals. CCANP Exh. 78 at 5-7; see also Goldberg, ff. Tr. 11491, at 56-57; cf. Tr. 12606-08 (Goldberg). The information developed concerning each contractor was summarized in a draft report entitled "South Texas Project Report on Contractor Replacement" (September 8, 1981). CCANP Exh. 78.

IX.28. On the morning of September 12, 1981, Mr. Jordan met with Mr. Oprea, Mr. Goldberg and HL&P counsel to consider the replacement of B&R. After hearing the views of participants in the meeting, Mr. Jordan decided, on behalf of HL&P, to go forward with the replacement of B&R and selected Bechtel as the contractor with whom to negotiate further. Tr. 12164 (Jordan); Tr. 12613-14 (Goldberg).

IX.29. On the afternoon of September 12, 1981, HL&P officials met with representatives of the other owners of the STP. There was unanimous agreement to recommend to the owners that B&R be replaced by Bechtel as A/E and construction manager. Tr. 12164 (Jordan); CCANP Exh. 83. On September 14, at a special meeting of HL&P's Board of Directors, Mr. Jordan reflected the recommendation of the owners representatives that B&R be replaced and obtained authorization to proceed from the Board. Tr. 12164-65 (Jordan). On September 15, the principals of each owner met at HL&P's offices and voted unanimously to authorize Mr. Jordan to conduct negotiations with Bechtel to replace B&R as A/E and construction manager. Tr. 12165 (Jordan).

IX.30. At that point it was still uncertain whether acceptable terms could be reached with Bechtel, and important basic matters remained to be resolved during the following week. Goldberg, ff. Tr. 11491, at 57. These included the terms under which Bechtel would accept full design responsibility for the entire Project, including the previous design work of B&R. Tr. 12608 (Goldberg). As soon as agreement in principle was reached, and even before the execution of a letter of intent, the Board was informed of the change. Goldberg, ff. Tr. 11491, at 57.

IX.31. Applicants' witnesses emphasized that an owner of a nuclear plant had never replaced its A/E after the issuance of a construction permit. Until HL&P had determined that a qualified company would be willing to replace B&R on acceptable terms, it could not be certain that a replacement would be

possible and there was no meaningful information to provide to the Board. HL&P did not consider whether to inform the Board before that time (or seek legal advice on that question, Tr. 11911 (Jordan); see Oprea, ff. Tr. 14095, at 14-15) because there was no hard information to impart and a premature public announcement of a change that might never take place would have had a significant adverse effect on Project activities and on the employees of B&R. In addition, the determination to seek a replacement for B&R was based on cost and schedule considerations, not QA or nuclear safety related concerns of the type normally of interest to the Board. Goldberg, ff. Tr. 11491, at 57-58; Tr. 12606-08 (Goldberg); Oprea, ff. Tr. 14095 at 14-15.

IX.32. Upon reviewing CCANP's Motion to Reopen, its opening statement and its cross-examination concerning events from June 29 to September 24, 1981, it is unclear exactly what points CCANP was trying to make. Its initial accusation in the Motion to Reopen was that counsel to HL&P manipulated the replacement decision for some improper purpose. That accusation was discredited even before the hearings began in the course of oral argument at the Sixth Prehearing Conference. Tr. 11042-52; cf. Tr. 10904-10, 10952-59, 10971-74. It was based on a footnote in the draft Report on Contractor Replacement which the CCANP representative admittedly mischaracterized in his questioning of Mr. Goldberg the Texas PUC hearing. Tr. 11047-48 (Sinkin). As the text of the footnote bore out, the Report on Contractor Replacement and the footnote called for the earliest possible

decision on the replacement of B&R so that meaningful discussions with the NRC (and any necessary proceedings before the Board) could be initiated. CCANP, admitting that the footnote did not support its accusation, nevertheless argued that Mr. Goldberg's response to its cross-examination regarding the mischaracterized footnote 4/ indicated that Applicants "withheld the information" to avoid letting the Board learn of the replacement decision before Applicants "could get their case on." Tr. 11044 (Sinkin). At the prehearing conference CCANP could cite no evidence in support of this allegation and no basis for its attack on Applicants' counsel. Both the testimony cited by CCANP and the Report on Contractor Replacement (CCANP Exh. 78) were consistent with the testimony presented in this hearing and discussed in this section. Moreover, both the Report on Contractor Replacement and the uncontroverted testimony at the hearing made clear that counsel's advice was to make the replacement decision as promptly as possible so that the NRC could be notified and any necessary proceedings before the Board initiated, in order to implement the replacement action at the earliest date. CCANP Exh. 78 at 17-18. Not only is there no evidence of manipulation, but the motive which CCANP would impute in support of its charge is completely specious. CCANP apparently alleges that HL&P did not inform the Board earlier because that might have led to

4/ Mr. Goldberg stated that "clearly, once the Board was notified that we were changing contractors, it might influence the scope of the Board's review." See CCANP Motion to Reopen, Exhibit A at 1359 (PUC Transcript); see also Tr. 11044.

cancellation of the hearings between June 29 and September 24, (See CCANP Motion to Reopen at 4, 46-47; Tr. 11045-46 (Sinkin)). As Applicants have pointed out, the limited hearings during that period all dealt with past events alleged by CCANP to reflect on Applicants' character, and corrective measures which had been taken to improve the quality of B&R construction. These subjects had to be considered whether or not B&R was replaced. Tr. 10912-13 (Axelrad); cf. Goldberg, ff. Tr. 11491, at 54; Jordan, ff. Tr. 11908, at 11-12.

IX.33. A peripheral question raised during the hearing was whether HL&P licensing counsel (particularly Mr. Newman) was acting in the capacity of an attorney in his participation in the activities associated with HL&P's consideration of replacing B&R. The record reflects that licensing counsel helped prepare and evaluate the RFPs, prepared the draft Replacement Report, and participated in the September meetings. Tr. 12466, 12613-15 (Goldberg); Tr. 14324-29 (Oprea). HL&P officials confirmed that counsel's advice pertained to licensing and contractual matters and that counsel performed in the role of a lawyer and not as a management official. Tr. 11982 (Jordan); Tr. 12464-66, 12615 (Goldberg); Tr. 14324-25, 14388 (Oprea); Cf. Oprea, ff. Tr. 14095, at 15. The only controversy created by CCANP's barrage of questioning and exhibits hinges on Mr. Goldberg's testimony before the Texas PUC (CCANP Exh. 90) that three people, Messrs. Oprea, Goldberg and Newman, individually prepared rating sheets of prospective contractors and that "the final deciding body"

included these three plus Mr. Jordan. CCANP Exh. 90, (PUC testimony at 1357. However, the evidence indicates that Messrs. Oprea, Goldberg and Newman simply advised Mr. Jordan, and Mr. Jordan alone made the final decision regarding the replacement of B&R. Tr. 12613-15 (Goldberg); see Tr. 11981 (Jordan). Moreover, the rating sheets were not used in the decisional process; and, in fact, Mr. Newman pointed out to Mr. Oprea that his "amateur's ranking" should not influence the conclusion reached by HL&P. His rating sheet was not provided to HL&P officials. Tr. 14324-25 (Oprea); CCANP Exh. 117. Although the role of Applicants' counsel in the replacement of B&R is not material to our determinations, we find that Mr. Newman's role was solely that of an attorney.

IX.34. The Board finds that the decision to replace B&R was not made until shortly before the Board was so notified. Prior to that time, no purpose would have been served by informing the Board of the various steps leading to replacement, since it was not clear that replacement would occur or was even possible. Therefore, the Board concludes that HL&P did not violate the McGuire rule by not informing the Board of B&R's replacement sooner than it did.

C. Candor of HL&P Witnesses' Phase I Testimony

IX.35. In LBP-85-6, the Board requested HL&P witnesses (Mr. Don Jordan, Mr. George Oprea, Mr. Jerome Goldberg and Mr. Richard Frazar) to explain why they did not mention the Quadrex

Report or concerns regarding B&R's engineering services in their 1981 testimony. As is shown by the findings below, these witnesses have satisfactorily explained why they did not mention these topics in their Phase I testimony, including specific segments identified by the Board.

Mr. Don Jordan

IX.36. Mr. Jordan is the Chairman of the Board of Directors and Chief Executive Officer of HL&P. At the time he testified in Phase I, Mr. Jordan understood that the Quadrex Report concerned the timeliness and efficiency of B&R's performance of engineering functions, rather than compliance with QA requirements at STP. Jordan, ff. Tr. 11908, at 3-4, Tr. 12140 (Jordan). He was informed that the Report confirmed that B&R had not performed its engineering functions in a timely and efficient manner (Tr. 11930 (Jordan)), and that the B&R engineering organization was weak and unlikely to support the Project without substantial improvement (Jordan, ff. Tr. 11908, at 3-4; Tr. 11931-32, 11934 (Jordan)); however, except for the few items determined to be reportable to the NRC, he understood that the Report did not show the STP design to be deficient or not in compliance with regulatory requirements. Jordan, ff. Tr. 11908, at 3-4. At the time he testified in Phase I, Mr. Jordan believed that the hearings dealt basically with construction and construction-related QA problems at STP, and that the NRC was interested in safety related matters and not whether B&R engi-

neering performed its functions in a timely and cost-effective manner. Jordan, ff. Tr. 11908, at 11; Tr. 12140 (Jordan). He further stated that he did not view the Quadrex Report as dealing with construction or QA matters (Tr. 12149 (Jordan)) or with the QA aspects of B&R's engineering efforts. Tr. 12182 (Jordan). He therefore reasonably believed that the Quadrex Report, which dealt with B&R's performance of engineering services, was irrelevant to matters being considered in the 1981 hearings.

IX.37. Mr. Jordan also satisfactorily explained why he did not mention his concerns about B&R's engineering performance in his testimony. Mr. Jordan felt that although the 79-19 investigation and the related Notice of Violation and Show Cause Order had identified serious problems in construction and construction-related QA, these problems had been vigorously addressed and were largely resolved by early 1981. Jordan, ff. Tr. 11908, at 5. He expected that B&R could satisfactorily perform the remaining construction at STP. Id. At the time he testified, HL&P was not actively considering removing B&R as A/E. In June of 1980, he and Mr. Oprea had questioned whether an experienced alternative would be available if necessary, but Bechtel and Ebasco had indicated that they were not interested and that changing contractors might not be in the best interest of the Project. Mr. Jordan was aware that such an action would be unprecedented and could have entailed an extended cessation of Project activities. Id. at 7. Thus, in the spring of 1981, although he had concerns about B&R's ability to perform engi-

neering and construction management for the Project in a timely and efficient fashion, he believed that the best course for the Project would be to improve B&R's performance, rather than to seek another A/E and construction manager, an alternative considered to be a "last resort." Jordan, ff. Tr. 11980, at 8-9; Tr. 11970-71 (Jordan). Specifically, he thought that HL&P should attempt to improve B&R's performance in these areas by enhancing B&R's ability to attract experienced personnel, subcontracting some areas of work, and restructuring B&R's engineering organization. Jordan, ff. Tr. 11908, at 8. HL&P management did not begin to seek a replacement for B&R or seriously consider removing B&R as A/E and construction manager until after June 26, 1981. Id. at 9; Tr. 12005-06 (Jordan); See Oprea, ff. Tr. 14095, at 10-11; Goldberg, ff. Tr. 11491, at 56. Because he believed that the 1981 hearings were focused on construction and construction-related QA, Mr. Jordan had a reasonable basis for concluding that his concerns about B&R's ability to perform engineering in a timely and efficient manner were not relevant to the matters upon which he testified in Phase I.

IX.38. Mr. Jordan has also satisfactorily explained his testimony in the specific segments of transcript about which we inquired in our February 26, 1985 Memorandum and Order, LBP-85-6, 21 NRC at 460.

a. Tr. 1269-70. As Mr. Jordan explained, the questions and answers on these pages focused on improvements made at STP in the construction program and the QA program since the

79-19 investigation and the Show Cause Order. He therefore reasonably believed that these questions did not relate to the Quadrex Report or other concerns with B&R's engineering performance. Jordan, ff. Tr. 11980, at 11-12.

b. Tr. 1294. Mr. Jordan's testimony on this page responded to questions concerning actions taken in response to the Show Cause Order. Jordan, ff. Tr. 11908, at 12. His testimony that the Project was in "good order" appropriately reflected Mr. Jordan's perception of the status of the Project from the standpoint of QA improvements that had been made. Id. There was thus no reason to mention either the Quadrex Report or other concerns related not to QA but to B&R's engineering performance on STP.

c. Tr. 1337. The questions to which Mr. Jordan responded on this page concerned his conclusions prior to the Show Cause Order about whether HL&P needed to implement extra QA measures because of B&R's limited nuclear plant construction experience up to that point. Jordan, ff. Tr. 11980, at 13. In the context of his testimony, Mr. Jordan had a reasonable basis for concluding that these questions dealt with B&R's nuclear construction, not engineering, experience, and that in any case the questions related to his opinions during a time period well before the issuance of the Quadrex Report.

d. Tr. 1402-05. Mr. Jordan's testimony on these pages discussed improvements in HL&P's QA/QC operations and the possible need for further modifications to QA/QC programs.

Jordan, ff. Tr. 11908, at 13. He reasonably believed that the questions on these pages were related to HL&P's actions to improve the QA program for STP and other site activities, rather than B&R's engineering performance. Id. at 13-14.

e. Tr. 1224-51. During the Phase II hearing, the Board also asked Mr. Jordan why he did not mention the Quadrex Report in the course of the examination by intervenors at Tr. 1224-51. Mr. Jordan explained that he understood the questions as focusing on whether, in light of the discovery of the error in B&R's estimate of the percentage of engineering complete at the time of Construction Permit issuance, HL&P had subsequently conducted any studies of B&R's integrity or the honesty of B&R's reports to HL&P. He viewed the Quadrex Report as addressing B&R's engineering performance, not its integrity or truthfulness. Tr. 12139-41 (Jordan). We agree that this explanation is satisfactory.

Mr. George Oprea

IX.39. Mr. Oprea satisfactorily explained why he did not mention the Quadrex Report during the 1981 hearings. He understood the Report to be concerned primarily with B&R's ability to perform engineering in a timely and cost-effective manner, and not with construction or construction related QA. Oprea, ff. Tr. 14095, at 13; see Tr. 14154 (Oprea). He also believed that the hearings were related to issues arising out of the 79-19 investigation and the Show Cause Order, especially construction and construction-related QA, rather than B&R's

engineering performance. Oprea, ff. Tr. 14095, at 12. Because of these reasonable beliefs, Mr. Oprea felt that the Quadrex Report had no bearing on the issues in the hearings and therefore did not mention it. Id. at 16-17; Tr. 14384-85 (Oprea).

IX.40. For similar reasons, Mr. Oprea did not mention his concerns about B&R's engineering performance, which were primarily related to B&R's ability to successfully complete the engineering effort. Oprea, ff. Tr. 14095, at 8-10. Because he believed that the hearings were related only to construction, construction QA, and similar safety-related matters, he reasonably did not consider his concerns about B&R's engineering productivity to relate to the issues before the Board. Id. at 16-17; Tr. 14384-85 (Oprea).

IX.41. Mr. Oprea also responded satisfactorily to the Board's inquiries with respect to why the Quadrex Report and concerns about B&R engineering services were not discussed in particular portions of his oral testimony:

a. Tr. 3469-73. From Tr. 3469 to the top of Tr. 3473, Mr. Oprea responds to a number of historical questions pertaining to studies performed by MAC in 1978 and 1979, and to some internal discussions prior to the Show Cause Order of the possibility of removing B&R from the Project. As Mr. Oprea explained, such questions about the earlier time period would not have suggested that he refer to the Quadrex Report or to his views on June 2, 1981, concerning B&R engineering services. Oprea, ff. Tr. 14095, at 20.

In addition, on Tr. 3473, Mr. Oprea is asked whether he had any discussions regarding the "removal of Brown & Root" after the Show Cause Order. We have previously found that there were no serious discussions concerning the removal of B&R between the Show Cause Order and June 29, 1981, and that Mr. Oprea's negative answer was accurate, consistent with Mr. Goldberg's testimony and not misleading. See Findings IX.25-26. Mr. Oprea also satisfactorily explained why the question did not bring to his mind either the Quadrex Report or that steps were being taken to enhance B&R's engineering capability. Oprea, ff. Tr. 14095, at 20-21.

b. Tr. 3486. Mr. Oprea responded to a question on this page about whether, in light of B&R's limited experience as a nuclear A/E, HL&P should have set up a system to review B&R's A/E work with greater scrutiny. This was the last of a series of questions pertaining to whether B&R's lack of experience as a nuclear A/E contributed to construction delays at STP. Oprea, ff. Tr. 14095, at 17. Mr. Oprea reasonably understood all of the questions as attempting to elicit information germane to the hearing on construction matters, i.e., B&R's inexperience as a nuclear A/E had resulted in preparation of excessively complex construction procedures. He acknowledged that HL&P might have conducted more engineering reviews, reflecting that they might have prevented some of the previously addressed root causes of construction problems. Because of his understanding of the

nature and context of the question, Mr. Oprea did not consider mentioning the Quadrex Report or other general current concerns about B&R engineering. Id. at 18.

c. Tr. 3527. The question and testimony on this page related to QA/QC problems identified in the 79-19 investigation and the Show Cause Order, and no mention of the Quadrex Report or concerns about B&R engineering productivity were called for. Oprea, ff. Tr. 14095, at 19.

d. Tr. 5458-74. Mr. Oprea understood the questions on these pages to pertain to (1) the general relationship between a utility and its contractors in connection with the issue of whether HL&P had abdicated its QA responsibilities to B&R prior to the Show Cause Order; (2) the justification for the Show Cause Order and its beneficial impact on STP and; (3) an allegation concerning construction at STP and HL&P's efforts to achieve open communications with site personnel. Oprea, ff. Tr. 14095, at 19-20. Mr. Oprea's understanding of the questions was reasonable.

Mr. Jerome Goldberg

IX.42. Mr. Goldberg satisfactorily explained why he did not mention the Quadrex Report in his testimony. At the time he testified, Mr. Goldberg was thoroughly familiar with the Report. Goldberg, ff. Tr. 11491, at 60-65, Tr. 11740 (Goldberg). He believed that the Report, although it pointed out a small number of deficiencies in the quality of B&R's engineering for

STP, was primarily related to B&R's ability to perform engineering in a timely and efficient fashion. Goldberg, ff. Tr. 11491, at 55. Mr. Goldberg did not consider the Quadrex Report to be a report on construction or QA, and viewed the few engineering quality problems discovered by the Report as ones unlikely to be identified by the QA function. Goldberg, ff. Tr. 11491, at 55. Because Mr. Goldberg understood the 1981 hearings to be focused on STP construction and construction-related QA problems, rather than design issues, he did not consider the Quadrex Report to be related to matters at issue in the hearings. Id. at 54.

IX.43. For similar reasons, Mr. Goldberg did not feel that his more general concerns about B&R's ability to support Project cost and schedule were generally relevant to matters at issue in the hearings. Mr. Goldberg understood that the hearings were related to construction and construction-related QA, and did not believe that the purpose of his testimony in Phase I was to address the engineering capabilities of B&R. Goldberg, ff. Tr. 11491, at 54, 60. Although his direct testimony did not address his concerns about B&R engineering, whenever asked about B&R's engineering capabilities, Mr. Goldberg did testify about his concerns. He mentioned several specific areas in which B&R needed to improve its technical resources, cited the need for B&R to better focus its management attention on STP, and stated that

he was not satisfied with B&R's engineering organization and that substantial improvements could be made. Goldberg, ff. Tr. 11491, at 60-61; Tr. 1158, 2386-87, 2404 (Goldberg).

IX.44. Mr. Goldberg also explained satisfactorily why he did not mention the Quadrex Report or his overall concerns with B&R's engineering performance in particular portions of his oral testimony:

a. Tr. 1095-96. Mr. Goldberg was asked what other "major" contractors there were at STP besides B&R and Westinghouse, and whether any other contractors had responsibility for QA and QC. Mr. Goldberg did not mention Quadrex or the Quadrex Report because Quadrex was not a major contractor and did not have any QA or QC responsibilities. Goldberg, ff. Tr. 11491, at 61-62.

b. Tr. 1143-52. Mr. Goldberg reasonably understood these questions to inquire as to the types of B&R design documents routinely reviewed by HL&P and how reviews of such documents were performed. Goldberg, ff. Tr. 11491, at 62. He did not mention the Quadrex Report because it did not address what type of B&R design documents would or should have been reviewed by HL&P, nor did it focus on the relationship between HL&P and B&R engineering organizations. Id.

c. Tr. 1158-59. Mr. Goldberg reasonably interpreted the question he responded to on these pages to inquire as to his overall perception of the problems he faced at the time he became HL&P's Vice President, Nuclear Engineering & Construction.

Goldberg, ff. Tr. 11491, at 63. He did not mention the Quadrex Report or his mid-1981 concerns with B&R engineering performance because he felt that the question was framed in terms of his perceptions at an earlier period. Also, he did not single out the Quadrex Report for mention because the question he was asked was very broad, and the Report was only one source of his later impressions. Mr. Goldberg did mention that he perceived that improvement was needed in B&R's resources on the Project. Id. at 63-64.

d. Tr. 2404-06. On these pages, Mr. Goldberg was asked about the adequacy of B&R's management of design, and about "principal problem areas" in which B&R's design activities had been found lacking. Goldberg, ff. Tr. 11491, at 64. He answered that there had been improvements, but that he was still not satisfied with B&R's performance in this area. He then discussed a number of problem areas which were being addressed, before he was interrupted for clarification of a point. Id. at 64-65. Mr. Goldberg's testimony at these pages and elsewhere conveyed his view that B&R needed to improve its design capabilities. Knowledge of the Quadrex Report was not necessary to understand his answers. Id. at 65.

Mr. Richard Frazar

IX.45. Mr. Frazar satisfactorily explained why his testimony in 1981 contained no mention of the Quadrex Report. He viewed the focus of the testimony that he gave in Phase I as

relating to matters that were in the Show Cause Order and were primarily related to construction matters. Tr. 14438-40 (Frazar). Moreover, he never attended any briefings connected with the Quadrex review, nor did he ever review the Quadrex Report. Frazar, ff. Tr. 14412, at 4. Consequently, he had little knowledge of the substance of the Report (Id.) and could not have given any meaningful testimony about it.

IX.46. At the time he testified, Mr. Frazar had only limited familiarity with B&R's engineering performance. Id. at 5. To the extent he was aware of this performance, he knew that HL&P QA and the NRC had periodically audited and inspected B&R's engineering activities, and believed that applicable QA requirements were generally being observed. Id. Mr. Frazar thus had no concerns about B&R's general engineering or engineering QA performance, and his testimony therefore contains no reference to such concerns.

IX.47. Mr. Frazar has also satisfactorily explained why he did not mention the Quadrex Report in particular portions of his oral testimony:

a. Tr. 3249-50. The questions and testimony at these pages concerned the organizational structure for the STP QA function. Mr. Frazar therefore reasonably saw no reason to mention the Quadrex Report or engineering QA in his answers. Frazar, ff. Tr. 14412, at 6.

b. Tr. 3527-28. Mr. Frazar here volunteered some information about implementation of the QA/QC program in the course of questioning addressed primarily to Mr. Oprea. Frazar, ff. Tr. 14412, at 7. This testimony focused on modifications made to QA and construction activities as a result of 79-19, and, in any event, Mr. Frazar would not have mentioned the Quadrex Report because, to his knowledge, it did not involve significant problems in QA implementation beyond those already reported to the NRC. Id.

c. Tr. 5419-22. Mr. Frazar reasonably interpreted the questions and testimony here to pertain to B&R's 1978 and 1979 QA organization and problems, and his perceptions of them. Frazar, ff. Tr. 14412, at 7-8. His testimony in response to these questions, was appropriately limited to the 1978-79 time period.

Conclusions

IX.48. In short, Messrs. Jordan, Oprea, Goldberg and Frazar each explained satisfactorily the reasons why they did not mention in their direct testimony in 1981 either the Quadrex Report or concerns regarding the adequacy of B&R's engineering services. Each of the witnesses also explained satisfactorily the reasons why they did not mention these subjects to any greater extent in response to questions at the Phase I hearing. When viewed in the context of the Phase I hearing, particularly as these witnesses understood the scope of that hearing, the

questions they were asked did not call for any mention of the Report or of HL&P's concerns regarding the adequacy of B&R engineering services. None of the answers to these questions was incomplete or not fully understandable as a result of the omission of any mention of the Report or HL&P's views of the adequacy of B&R's engineering services. In light of the explanations provided by the witnesses the Board finds that the testimony of each of these witnesses in both Phase I and Phase II was truthful, candid and appropriate to the questions they were asked.

X. CURRENT COMPETENCE

A. HL&P's Current Section 50.55(e) Reporting Program

X.1. In our February 26, 1985 Memorandum and Order (LBP-85-6, 21 NRC 447(1985)) and our Sixth Prehearing Conference Order dated May 17, 1985 (unpublished; explained in Memorandum and Order, dated June 18, 1985 (unpublished)), we identified as an issue to be litigated in Phase II, HL&P's competence in light of its "current methodology for evaluating 10 C.F.R. § 50.55(e) deficiencies. . . ." 21 NRC at 460; see also Sixth Prehearing Conference Order at 8. In particular, we indicated that "HL&P's system for ascertaining that such deficiencies exist, including the level and competence of the persons charged with that responsibility, are matters appropriate for adjudicatory consideration in Phase II, that "[c]hanges (if any) since 1981 would also be pertinent," and that "HL&P's current method for trending QA violations or deficiencies, including changes (if any) since 1981, would be a matter on which we would expect . . . testimony." 21 NRC at 460.

X.2. Applicants presented Mr. Mark R. Wisenburg, HL&P's Manager, Nuclear Licensing to testify on this issue. Mr. Wisenburg has 10 years of commercial nuclear licensing experience with the Tennessee Valley Authority (TVA) and HL&P, including considerable experience with the requirements of 10 C.F.R. § 50.55(e), as well as 10 years of naval nuclear experience. During his tenure at TVA, he was involved in evaluating numerous

matters for reportability and prepared or supervised the preparation of written Section 50.55(e) reports for the Yellow Creek, Bellefonte, Watts Bar and Sequoyah nuclear plants. In his current position, he reviews all Section 50.55(e) determinations by the STP Incident Review Committee (IRC) and often participates in technical reviews of individual matters. He prepared the first revision of HL&P's current reporting procedure, supervised the preparation of subsequent revisions and has trained HL&P Engineering and QA personnel in applicable reporting procedures and requirements. Wisenburg, ff. Tr. 14514, at 1-3. He is amply qualified. The Staff witnesses who addressed HL&P's Section 50.55(e) procedures were Mr. H. Shannon Phillips, Senior Resident Inspector at the STP site from September, 1979 until January, 1982 (Phillips (50.55(e)), ff. Tr. 15116) and Mr. Donald L. Garrison, currently the Resident Construction Inspector at STP (Garrison, ff. Tr. 15110). During his tenure at STP, Mr. Phillips routinely inspected HL&P's system for reporting deficiencies. Phillips (50.55(e)), ff. Tr. 15116, at 2. Mr. Garrison has also routinely inspected HL&P's reporting system during his tenure, and has recently preformed a detailed study of the functioning of that system. Garrison, ff. Tr. 15110, at 1-2, 4; Tr. 15128, 15167-68 (Garrison). Both witnesses were well qualified to assess HL&P's reporting system.

X.3. The current STP procedure governing reportability reviews pursuant to Section 50.55(e) (PLP-02, Revision 6, App. Exhs. 66 and 66A), places the responsibility for evaluating and

reporting conditions pursuant to Section 50.55(e) with HL&P. Procedures are also in effect defining the responsibilities of Bechtel and Ebasco personnel for the identification and evaluation of deficiencies and the notification of HL&P. Wisenburg, ff. Tr. 14514, at 3-4; Garrison, ff. Tr. 15110, at 2-4.

X.4. Any HL&P employee becoming aware of a condition which he believes may constitute a significant deficiency (within the meaning of Section 50.55(e)) is required to promptly prepare a Deficiency Evaluation Form (DEF) describing the condition. Regular training is conducted for HL&P employees covering the requirements of Section 50.55(e), applicable Staff guidance, and the provisions of the applicable procedure. Tr. 14569-71 (Wisenburg). The DEF is promptly reviewed by HL&P Engineering personnel and, if it is determined that a significant deficiency exists, the DEF is provided to the IRC for evaluation for reportability. Even where HL&P Engineering concludes that no such deficiency exists, the basis for that determination is documented and the DEF is forwarded to the IRC Chairman for his review. Wisenburg, ff. Tr. 14514, at 4-5.

X.5. A similar process is in place for Bechtel employees, requiring the initiation of a Deficiency Evaluation Report (DER) whenever a deficiency which may be significant is identified, and notification of HL&P if Bechtel concludes that such a deficiency exists. Id.; Tr. 14516-17, 14572-73 (Wisenburg). Ebasco employees are responsible for bringing conditions which may represent significant deficiencies to

Bechtel's attention and Bechtel, as appropriate, may generate a DER. These programs are consistent with applicable Staff guidance governing timely notification of the Staff. Garrison, ff. Tr. 15110, at 4-5; Tr. 15168 (Garrison). Deficient conditions, regardless of whether or not they are reportable, are resolved through applicable Project procedures. Wisenburg, ff. Tr. 14514, at 5.

X.6. The IRC is chaired by HL&P's Supervising Engineer - STP Licensing, Mr. Michael Powell, and HL&P's Project QA Supervisor, Mr. Paul Ratter also sits on the Committee. Id. Mr. Powell has a Bachelor of Engineering in Electrical Engineering and a M.S. in Nuclear Engineering. He has 7 years of nuclear licensing experience, is a Registered Professional Engineer in Texas, and has served as IRC Chairman since 1980. 1/ Id. at 6. Mr. Ratter has 14 years of commercial nuclear QA/QC experience, has participated as a utility representative in the development

1/ Although CCANP sought to subpoena Mr. Powell in order to, among other things, examine him on his qualifications, we quashed the subpoena as beyond the scope of CCANP's initial justification for subpoenas and as unreasonable (Tr. 12978). (See Finding VI.18, for a complete discussion of CCANP's attempts to subpoena Mr. Powell.) In determining the acceptability of HL&P's program for evaluating Section 50.55(e) deficiencies, we believe it would be wholly inappropriate for this Board to attempt to give competency examinations to HL&P personnel on the witness stand. In any event, we note that Mr. Powell has chaired the IRC since 1980 and that, while there have been some noncompliances associated with HL&P's Section 50.55(e) reporting over the years, the Staff has generally found HL&P's performance in this area to be acceptable. See Findings X.37-38 infra. The fact that Mr. Powell has chaired the IRC during that period speaks more for his competence than any testimony he could provide to us.

of the Institute of Nuclear Power Operations (INPO) Performance Objectives and Criteria for Construction Project Evaluations, and holds certificates as an ANSI Level III Inspector in Procurement, a Lead Auditor, a Quality Specialist Mechanical and a Level II Inspector for a number of non-destructive examination techniques. Id. at 7. Both men are amply qualified to sit on the IRC.

X.7. The IRC also includes an Engineering representative cognizant in the discipline affected by the particular condition being evaluated and other individuals, designated on a case by case basis by the Chairman, who are familiar with the matters to be evaluated. Both Mr. Powell and Mr. Ratter may designate others to sit on the Committee in their stead. Id. at 5. Additionally, the Group Vice President, Nuclear, may also convene a committee to perform an evaluation under Section 50.55(e). Id. at 6; Tr. 14518-19 (Wisenburg); App. Exh. 66 at section 4.3.4. Such a committee could be formed in special circumstances requiring individuals with more specialized knowledge or experience than the standing IRC. Tr. 14522-23 (Wisenburg). 2/

2/ During the testimony of Mr. Goldberg, CCANP examined him at length concerning his interpretation and application of Section 50.55(e), because it claimed his competence was at issue in light of his responsibilities under HL&P's Section 50.55(e) program. Although an Applicant's expertise in interpreting its reporting obligations is relevant to its technical competence, it does not follow that any conclusions we might draw regarding the technical expertise of an officer of the company in interpreting Section 50.55(e) would be probative of the company's technical competence. Nevertheless, we permitted such cross-examination and found that Mr. Goldberg is very knowledgeable concerning the
(footnote continued)

X.8. Once the IRC is notified of a significant deficiency, it is required to conduct an initial evaluation to determine if the condition is reportable or potentially reportable and, if so, to report it to the NRC within 24 hours of that notification. The Manager, Nuclear Licensing concurs with the IRC determination and ensures that sufficient information is being provided to the NRC. Wisenburg, ff. Tr. 14514, at 7-8; Tr. 14552-53 (Wisenburg). Mr. Wisenburg (as well as Mr. Goldberg and Mr. Robertson, HL&P's prior Licensing Manager) testified that in no case has he ever overruled an IRC determination to notify the NRC of a condition it deemed reportable or potentially reportable. Tr. 14553-54 (Wisenburg); Tr. 12288 (Goldberg); Tr. 14721-24 (Robertson). HL&P management is informed of items reported to the NRC. Wisenburg, ff. Tr. 14514, at 7.

X.9. Once the NRC is notified of the condition, a technical evaluation is conducted and, if the initial determination of reportability is confirmed, a written report is forwarded to the NRC within 30 days of the initial notification of the NRC. Mr. Wisenburg reviews the IRC's completed evaluations, and Mr. Goldberg reviews and signs the written reports to the NRC. Id. at 8-9.

(footnote continued from previous page)
requirements and intent of Section 50.55(e), and that he is well qualified to perform reportability reviews. Findings VII.26, 37.

X.10. If the technical evaluation indicates that the condition is not, in fact, reportable, the IRC confirms and documents the non-reportability determination and informs the NRC. Id. at 9. In instances where the technical evaluation cannot be completed in 30 days, the condition being evaluated is considered reportable and an interim report is prepared for submission to the NRC. Id. at 9-10. The Staff witness testified that the documentation prepared by the IRC for items deemed reportable or non-reportable is satisfactory. Tr. 15166 (Garrison).

X.11. The current reporting program at STP also includes mechanisms to ensure that reportable conditions have not been overlooked. The IRC is periodically convened by the Chairman to review DEFs determined by HL&P Engineering not to warrant IRC review. Bechtel DERs determined not to identify significant deficiencies are informally reviewed by HL&P Licensing and Engineering personnel. Wisenburg, ff. Tr. 14514, at 10; Tr. 14517-18, 14530-31, 14576-77 (Wisenburg).

X.12. In our Sixth Prehearing Conference Order at 8, we expressed an interest in obtaining information regarding the "actual operation" of HL&P's reporting procedures, particularly in an instance where an item was reviewed for reportability and determined not to be reportable or potentially reportable. We cited, in particular, an open item from NRC Inspection Report

83-12 (open item 83-12-01). Applicants and the Staff provided testimony on that subject. Wisenburg, ff. Tr. 14514, at 13-16; Johnson and Constable, ff. Tr. 14846, at 12-13.

X.13. The particular matter addressed in open item 83-12-01 which was evaluated for reportability, concerned the apparent omission of references to specific QA standards in three Bechtel procurement specifications, and had been identified in two HL&P audits of Bechtel Engineering. Wisenburg, ff. Tr. 14514, at 13-14. In response to the NRC inspector's concern that the item may have been indicative of a reportable breakdown in the STP QA program, a DEF was initiated and forwarded to the IRC. Id. at 15. The IRC reviewed the matter and concluded that there had been no significant QA breakdown, and that it did not meet the Section 50.55(e) reportability criteria. Id.; Johnson and Constable, ff. Tr. 14846, at 13.

X.14. We concur with HL&P's assessment of the reportability of the condition described in open item 83-12-01, and conclude that the requirements of Section 50.55(e) (particularly the requirements of Section 50.55(e)(1)(i) relating to significant QA breakdowns), were correctly applied. Furthermore, we believe that there is reasonable assurance that HL&P has and will continue to correctly apply that provision in other instances. 3/ Mr. Wisenburg testified that all conditions reviewed by the IRC

3/ We note our agreement with Mr. Wisenburg's responses to CCANP's inquiries regarding application of Section 50.55(e) to various aspects of a recent INPO evaluation of STP. Tr. 14539-48 (Wisenburg).

are routinely evaluated to determine whether they represent a significant breakdown in the STP QA program regardless of whether the other criteria for reportability have been satisfied. Wisenburg, ff. Tr. 14514, at 12. In determining whether a significant QA breakdown exists, Mr. Wisenburg indicated, correctly we believe, that there are no objective standards and that the determination must be made on the basis of sound judgment by knowledgeable persons. While the mere existence of a deviation from the QA program (such as an inadequate, incomplete or erroneous inspection record) may not rise to the level of a significant QA breakdown, the nature, extent and ramifications of the specific condition being evaluated must be considered. Id. at 13.

X.15. We were also interested in ascertaining whether HL&P considers whether a number of conditions, not in themselves reportable QA breakdowns, might, taken together, represent such a breakdown. We found that HL&P's trending program provides for the review of all deficiency documents generated on the Project (including DEFs and DERs) against the criteria of Section 50.55(e), through the evaluation of identified trends for reportability. Wisenburg, ff. Tr. 14514, at 16-18.

X.16. The procedure in effect on May 8, 1981 for identifying and reporting deficiencies was consistent with the requirements of Section 50.55(e). It required individuals identifying conditions warranting review for reportability to promptly call such matters to the attention of appropriate

management, and placed responsibility on appropriate personnel to make timely reportability determinations and to notify the NRC of reportable conditions within the time limits prescribed by Section 50.55(e). HL&P has subsequently enhanced the procedure by adding the DEF requirement, clarifying the responsibility of individuals identifying conditions warranting evaluation, adding a requirement for the completion of IRC evaluation checklists, and providing for the concurrence of the Manager, Nuclear Licensing in all reportability determinations. Id. at 10-12.

X.17. Mr. Phillips, the former STP Senior Resident Inspector, testified that during his tenure at STP (September, 1979 to January, 1982), he routinely inspected HL&P's system for reporting deficiencies and that HL&P "was forthright in identifying deficiencies to the NRC . . . , reported a larger number of deficiencies, when it could have taken a more conservative approach, and reported fewer, [and possessed] a sincere desire to do a good job even though their inexperience and oversight sometimes resulted in violations of 10 C.F.R. 50.55(e) reporting requirements." Phillips (50.55(e)), ff. Tr. 15116, at 3-4. He concluded that he had seen no indication that HL&P had abdicated or refused to accept its responsibility to protect the public health and safety, and that the remedial steps taken by HL&P since 1981 reflect positively on its character and competence. Id. at 4.

X.18. Mr. Garrison, as Resident Construction Inspector has, in the course of his regular duties, evaluated the current process established at STP for the identification, evaluation and reporting of conditions pursuant to Section 50.55(e). Garrison, ff. Tr. 15110, at 1-2, 4; Tr. 15128 (Garrison). He testified that that process meets applicable regulatory requirements and Staff guidance, and provides for timely notification and reporting to the Staff. Garrison, ff. Tr. 15110, at 4-5; Tr. 15168 (Garrison). Mr. Garrison further noted that there had been no deficiencies in the HL&P reporting system identified since 1983 (Garrison, ff. Tr. 15110, at 4-5), and that all DERs and DEFs since January 1, 1984 have been processed in accordance with the timeliness guidelines established by the Staff (Tr. 15167-68 (Garrison)). He stated that HL&P's trending program is "satisfactory and broad enough to identify occurring trends." Garrison, ff. Tr. 15110 at 6; Tr. 15168-69 (Garrison). Finally, Mr. Garrison testified that, in his opinion, HL&P is a competent organization. Tr. 15164 (Garrison).

B. Issue B/D-1-Adequacy of Backfill Placed by Ebasco

X.19. In our Sixth Prehearing Conference Order at 8, we admitted Issue B/D-1 which stated:

B/D-1. Is there reasonable assurance that the backfill placed at STP by Ebasco is in conformity with the construction permits and the provisions of Commission regulations in light of the two violations in the area of "soils and foundation" discussed in I&E Rept. 83-26 (dated April 20, 1984) and findings 23 and 24 in the programmatic audit filed by HL&P on May 25, 1984 (ST-HL-AE-1095)?

X.20. Applicants presented a panel of witnesses on Issue B/D-1 comprised of Mr. Thomas J. Jordan, HL&P's Project QA Manager, Mr. Alfredo Lopez, Bechtel's Civil/Structural Engineering Group Supervisor for STP, and Mr. Walter R. Ferris, a geotechnical consultant to Bechtel Civil & Minerals, Inc. Jordan, et al., ff. Tr. 13645. Mr. Jordan has over 8 years of QA experience and has served as Lead Engineer for the STP Mechanical QA Group, Supervisor Quality Systems and Project QA Supervisor for Design/Procurement. In his current position, he is responsible for ensuring the proper planning, development, implementation, coordination and administration of the STP QA program. Id. at 1-3.

X.21. Mr. Lopez has a M.S. in Structural Engineering from the University of California, Berkeley and 19 years of civil/structural engineering experience, including over 13 years of nuclear-related experience. He is a Registered Professional Engineer in California. Id. at 3-4.

X.22. Mr. Ferris has a S.M. in Soil Mechanics from Harvard University and 34 years of geotechnical engineering experience. He has lectured and taught courses at Harvard University in soil mechanics, soil testing and engineering geology, and served as Chief Soil Engineer for Bechtel Civil and Minerals, Inc., for 12 years. Mr. Ferris has had extensive experience in the design of nuclear and fossil power plant

foundations, dams, heavy industrial structures, airfields and highways, and is a Registered Civil Engineer in Minnesota and California. Id. at 4-6.

X.23. Applicants described the functions of the organizations currently performing Category I backfill placement, testing and inspection activities at STP. HL&P, as the licensee, is, of course, responsible for ensuring that applicable requirements are met. It carries out that responsibility by providing programmatic direction and overview to Project contractors, and by performing audits, surveillance and inspections. Bechtel issues design documents, approves contractors' work procedures, conducts audits and surveillance, and verifies testing of backfill material upon receipt. Ebasco (Ebasco Constructors, Inc. and Ebasco Services, Inc.) places and inspects backfill and coordinates the work of the testing contractor by supervising construction work, auditing, inspection, surveillance, and through direction of testing and acceptance of testing results. Finally, Pittsburgh Testing Laboratory (PTL), the testing contractor, performs the field and laboratory testing of the backfill. Id. at 7-8.

X.24. The amount of Category I backfill work performed and remaining to be performed by the current contractors is limited. The prior contractor had placed almost 2,000,000 cubic yards of Category I backfill, while Ebasco has placed about 200,000 cubic yards primarily around piping, ducts and other

miscellaneous facilities. Id. at 9. Only about 106,000 cubic yards remain to be placed by Ebasco in small amounts, none of which are expected to exceed 5,000 cubic yards. Id. at 9-10.

X.25. The first violation in the soils and foundation area which was the subject of Issue B/D-1 was Notice of Violation 83-24-02, a severity level IV violation. It cited HL&P for failure to comply with an aspect of American Society for Testing and Materials (ASTM) Standard D2049-69 which had been incorporated by reference into a Bechtel specification. The ASTM standard specified that a funnel pouring device be utilized in minimum density testing of soil samples, rather than a scoop pouring device, where the maximum size of soil particles does not exceed 3/8 inch. Bechtel had authorized PTL to utilize the scoop pouring device regardless of the maximum size of the particles present in the sample, but did not utilize formal specification change procedures in authorizing the change. Id. at 10; Tapia, ff. Tr. 13752, at 2-3; App. Exh. 67 at 1.

X.26. In response to the Notice of Violation, PTL was directed to perform future minimum density testing in strict conformance with the ASTM standard and a review of the technical adequacy of the scoop method was initiated in order to determine the acceptability of the backfill placed during the period in which the scoop was exclusively utilized. That review demonstrated that the scoop was, in fact, a representative and consistent method for determining the minimum density of STP Category I backfill, and that the actual relative density of such

soil is more than adequate to perform its structural function, even if conservative adjustments are made to account for the lower minimum density measurements anticipated from the scoop method. Jordan, et al., ff. Tr. 13645, at 11; Tapia, ff. Tr. 13752, at 3-4; App. Exh. 67 at 2-5. Furthermore, since Bechtel had authorized PTL to utilize the scoop without utilizing formal specification change procedures, a review was conducted to determine the extent to which design changes had been made in other instances without the use of formal design change procedures. App. Exh. 67 at 5-6. That review disclosed no other instance of a design change for which no formal design change documents had been generated. Id. at 6. In addition to HL&P's actions in direct response to the specific violation, HL&P management also initiated a comprehensive programmatic/technical audit of STP Category I backfill activities in order to ensure that such activities are being carried out in accordance with applicable requirements. Jordan, et al., ff. Tr. 13645, at 11-12; App. Exh. 67 at 6.

X.27. The minimum density of Category I backfill is determined in order to calculate the "relative" density of the compacted backfill. Using the minimum density (i.e., the loosest possible state of density the soil can achieve with the particles in grain to grain contact and without segregation of particle sizes or arching), the maximum density and the in-place density, the "relative" density of the backfill is calculated and compared to the applicable design criteria. The STP criteria call for a

minimum relative density of 80% and a running average relative density of 84% for Category I "structural" backfill (generally within the power block area), and a minimum relative density of 70% for Category I "yard" backfill. Jordan, et al., ff. Tr. 13645, at 12-13; Tr. 13687-89 (Ferris). Use of the scoop in performing minimum density testing may result in lower minimum density measurements and, therefore, higher relative density measurements. Accordingly, compliance with the relative density design criteria might be more readily achieved when the scoop is used than when the funnel is used. Jordan, et al., ff. Tr. 13645, at 13-15; Tapia, ff. Tr. 13752, at 3.

X.28. Applicants' expert in geotechnical engineering, Mr. Walter R. Ferris, (who we found to be both knowledgeable and instructive) concurred with the conclusion in Applicants' response to the notice of violation that the minimum density values obtained with the scoop pouring device more closely reflect the actual minimum density of the Category I backfill at STP than those obtained with the funnel. Jordan, et al., ff. Tr. 13645, at 14-18; Tr. 13711-12 (Ferris). In fact, he testified that the actual minimum density of the STP Category I backfill may be even lower than calculated with the scoop, substantiating the adequacy of the soil placed during the period in which the scoop was exclusively utilized. Jordan, et al., ff. Tr. 13645, at 15. Mr. Ferris' conclusion was consistent with the conclusions of the committee of soils experts who testified in Phase I. See App. Exh. 6 at 32.

X.29. Nevertheless, in order to further confirm the adequacy of the Category I backfill placed during the time when the scoop method was utilized, Mr. Ferris conducted an additional analysis of the testing data using conservative assumptions. Jordan, et al., ff. Tr. 13645, at 15-16; Tr. 13700 (Ferris). While, under that analysis, some of the adjusted test values fell below the design criteria for relative density, they were determined to have no technical significance. Jordan, et al., ff. Tr. 13645, at 16-18. Even the lowest adjusted values represented relative densities which would provide an ample margin against liquefaction, (Id.; Tr. 13695 (Ferris); Tr. 13718-19 (Lopez); see also Tapia, ff. Tr. 13752, at 4), and Mr. Ferris testified that, in the case of STP, there is no chance of liquefaction. Tr. 13669-72, 13695-96, 13717-18 (Ferris). Additionally, since none of the low adjusted values were directly below Category I building foundations, bearing capacity and settlement are not a concern. Jordan, et al., ff. Tr. 13645, at 17. Therefore, the Category I backfill, even under conservative assumptions, was demonstrated to provide the necessary structural integrity for Category I structures.

X.30. Mr. Ferris stressed his opinion that the actual density of the STP Category I backfill is even higher. Tr. 13700-703, 13711-12 (Ferris). That conclusion was based, in part, upon another analysis which focused upon "percentage compaction" (Tr. 13701 (Ferris)), a method that is a generally accepted measure of soil density and has been accepted at other

nuclear plant sites. Tr. 13704-05, 13729-30, 13742-43 (Ferris). The Staff witness concurred as to the validity of both that method and Mr. Ferris' correlation of percentage compaction to relative density. Tr. 13772-73 (Tapia). Accordingly, the uncontroverted testimony demonstrated that the Category I backfill placed during the time when the scoop was utilized is more than adequate to perform its intended function.

X.31. Applicants' Exhibit 67 was an amended version of its original response to Notice of Violation 83-24-02. Tr. 13647 (T. Jordan). The amended response corrected and clarified various portions of the original response which had been previously served on the Board and the parties. 4/ Tr. 13647 (Lopez). The principal change related to the identification of

4/ Mr. Lopez explained each of the changes in the amended response during his testimony. Tr. 13647-49 (A. Lopez). Some of the items were discovered during the preparation of testimony on this issue while others were found previously and corrected in the closure package made available to the NRC Staff. Tr. 13722-23 (A. Lopez). At the hearing, Applicants' witnesses indicated that steps were being taken to evaluate and address the processes for ensuring the accuracy of future responses to notices of violation. Tr. 13723-24 (A. Lopez); Tr. 13724-25 (T. Jordan). Although in response to the Board's inquiry, the Staff indicated that it will investigate whether the original response constituted a "material false statement," (Tr. 13787-88 (Tapia)) we have determined that the changes to the original response do not affect our determination concerning character and competence. As set forth below, the changes were minor and did not affect the conclusions of either the Applicants' or Staff's witnesses regarding the adequacy of the backfill. Moreover, all of the changes were brought forward by the Applicants, and there is no indication that there was any intent to deceive either the Staff or the Board. Finally, it is commendable that Applicants are taking corrective action that will apply to future responses beyond the soils area.

six relative density values which, after adjustment for use of the scoop rather than the funnel, fell below the 80% minimum relative density criterion and were located in areas where structures were or will be constructed. Five of the adjusted test values were located in an area where the Unit 2 MEAB truck loading bay will be constructed, and one adjusted test value was located below the Unit 2 Auxiliary Feedwater (AFW) Storage Tank. Tr. 13641 (Ferris); App. Exh. 67, cover letter at 1, Attachment at 2-3. With respect to the area where the Unit 2 MEAB truck loading bay will be constructed, all five values are at elevations above the foundation of that structure, not in a distinct concentration, and have no effect on the ability of the backfill to support the bay. Tr. 13641, 13696-97 (Ferris); Tr. 13720 (Lopez); Tr. 13774, 13780-81, 13782-84 (Tapia). Furthermore, Mr. Ferris testified that the actual relative densities of two of the five points (without the application of conservative assumptions regarding differences between scoop and funnel values) meet the 80% design criteria, and that the other three are actually 75% relative density. Tr. 13704 (Ferris). Mr. Tapia concurred that even 75% relative density is satisfactory. Tr. 13777 (Tapia). With respect to the single adjusted value below the Unit 2 AFW Storage Tank, the adjusted relative density value was 78.7%. App. Exh. 67, attachment at 3; Tr. 13775 (Tapia). That value was determined to pose no problem of differential settlement, bearing failure, or cracking of the tank, and did not affect the witnesses' conclusions regarding the adequacy of the backfill. Tr.

13726-29 (Ferris, Lopez); Tr. 13775-778 (Tapia). Furthermore, Mr. Ferris testified, based on the correlation between percentage compaction and relative density, that the actual relative density of that single value is, in fact, 80%. Tr. 13703-04, 13726-27 (Ferris). In short, we conclude that although certain minor clarifications or corrections to Applicants' original response were required, the changes do not affect the overall adequacy of the backfill, or cast doubt on Applicants' competence.

X.32. The second "violation" addressed in Issue B/D-1 was not a violation, but was, instead, issued as an unresolved item by the Staff. Unresolved Item 83-24-01 noted that Ebasco's written QC procedure only required daily QC monitoring of backfill placement activities and that, therefore, the potential for inadequate QC inspection existed. Jordan, et al., ff. Tr. 13645, at 18-19; Tapia ff. Tr. 13752, at 4. Although the written procedure required only daily monitoring, Ebasco QC had, in fact, been inspecting virtually every significant lift on every workshift since safety-related backfill operations began, and was adequately monitoring placement activities. Jordan, et al., ff. Tr. 13645, at 19; Tr. 13653, 13689-93 (T. Jordan). In response to the Unresolved Item, the procedure was modified to more closely reflect Ebasco's actual practice (Jordan, et al., ff. Tr. 13645, at 19), and the Staff concluded that the item had been addressed satisfactorily. Id. at 20; Tapia, ff. Tr. 13752, at

4-5. No question was raised as to the adequacy of the backfill resulting from this item. Jordan, et al., ff. Tr. 13645, at 19-20; Tapia, ff. Tr. 13752, at 5.

X.33. The two audit findings which are addressed in Issue B/D-1 are those designated as items 23 and 24 in Applicants' summary of the programmatic soils audit conducted by HL&P as part of its response to Notice of Violation 83-24-02 (App. Exh. 68). Jordan, et al., ff. Tr. 13645, at 20. Audit finding 23 reflected HL&P QA's concern that, contrary to the FSAR and applicable specification, Ebasco's inspection procedure did not provide sufficient instruction to QC Inspectors as to the depth within an individual lift (or layer) of backfill at which in-place density testing should be performed to ensure that representative in-place density information for depth intervals within each lift was obtained. App. Exh. 68, attachment at 8; Jordan, et al., ff. Tr. 13645, at 20-21. While the FSAR and specification required that such information be obtained, the procedure provided no guidance for achieving the desired result. Id. at 21-22. The testimony indicated that, since variations in density with depth within lifts are small at STP, the determination of in-place density at any depth within a lift will be representative of that lift (Tr. 13725-26 (Ferris)), and that QC Inspectors vary the depth at which in-place density tests are performed, providing further assurance that representative information is being obtained (Jordan, et al., ff. Tr. 13645, at 22-23). Furthermore, since the judgment as to the adequacy of

the STP Category I backfill is based on the overall distribution of test sample locations, rather than density variations within individual lifts, lack of information regarding the depth of samples within each lift would not cast doubt on the adequacy of the STP Category I backfill. Id. at 23; Tr. 13793-95 (Tapia). In response to the audit finding, both the FSAR and the specification were modified to eliminate the unnecessarily conservative requirement that representative in-place density information for depth intervals within individual lifts be obtained. Jordan, et al., ff. Tr. 13645, at 23.

X.34. Audit finding 24 reflected HL&P QA's concerns that Ebasco's inspection procedure did not require that test depths be recorded, and that test depth information was not being provided to PTL by Ebasco for inclusion in PTL test reports. App. Exh. 68 at 9; Jordan, et al., ff. Tr. 13645, at 24. As indicated in paragraph X.33 above, there is no need to identify or document testing depths for purposes of assessing the adequacy of STP Category I backfill (Tr. 13793-94 (Tapia)) so long as lift elevations in which the tests were taken are recorded. Ebasco had been recording such elevations. Jordan, et al., ff. Tr. 13645, at 24. In any event, the applicable specification and procedure were modified to require that test depths be recorded, and the specification was modified to require Ebasco to provide test depth information to PTL. Id. at 25.

X.35. The Staff witness, Mr. Tapia, testified that audit findings 23 and 24 are "repetitions of Noncompliance No. 4 in NRC Report No. 79-19." He also testified, however, that the "testing technique was satisfactory . . .," and that the "fact that depth criteria did not exist and documentation was not occurring is of minor significance. . . ." Tapia, ff. Tr. 13752, at 5-6. Based upon his review of the responses to the two audit findings, and the "violations," he concluded that they represented "minor conditions that have not impacted the adequacy of the backfill material," and that there is reasonable assurance that the backfill placed at STP by Ebasco is in conformity with appropriate design requirements of the construction permits and Commission regulations. Id. at 6. Furthermore, Mr. Tapia stated that HL&P's actions, based upon his experience since Phase I, speak positively for its character, that those individuals on the Project that he has come in contact with have been "very competent," and that the soils matters addressed in the testimony neither reflect an unwillingness to abide by regulatory requirements on HL&P's part nor an abdication or refusal to accept its responsibility to protect the public health and safety. Tr. 13796-97 (Tapia). CCANP did not refute the conclusions of either the Applicants' or Staff's witnesses.

X.36. Accordingly, we conclude that the concerns reflected in the violation, unresolved item and audit findings which are the subject of Issue B/D-1 are minor, if not completely inconsequential from a technical perspective, that the technical

adequacy of the Category I backfill work being performed by the current contractors is not in question, and that there is reasonable assurance that existing and future Category I backfill activities have been and will be carried out in a manner consistent with applicable regulatory requirements. Jordan, et al., ff. Tr. 13645, at 25-26. Although we were concerned that backfill problems similar to those litigated in Phase I had reoccurred, we note favorably that HL&P management reacted promptly and vigorously by initiating a comprehensive programmatic/technical audit of backfill and ensuring that design changes were not made in other areas without use of formal procedures.

C. NRC Staff Views on HL&P's Current Competence

X.37. As described in ¶¶ VI.10-11, in response to our request for a report on the performance of HL&P, Bechtel and Ebasco since the close of the record in Phase I, the Staff filed the joint affidavit of the Region IV managers and inspector most closely involved with STP. Joint Affidavit of William A. Crossman, Johns P. Jaudon and Dan P. Tomlinson, filed December 21, 1984 (hereinafter Staff Affidavit). ^{5/} The Staff Affidavit may be summarized as follows: After the Staff performed a detailed review of various Project specifications and drawings, construction activities resumed at STP in 1982. Staff Affidavit,

^{5/} The Staff Affidavit was originally filed on December 21 and an executed copy was submitted on January 4, 1985. The Staff filed corrections to the Affidavit on January 24, 1985.

at ¶¶ 12-14, 29-31. The Staff has performed numerous inspections since then, covering a wide variety of construction activities. Id. at ¶¶ 15-16. During the course of these inspections, the Staff found ten violations all of which were severity level IV or V, which are generally considered to be minor. Id. at ¶ 17-18 as corrected by the Staff on January 24, 1985. HL&P acted promptly on each of them and its responses appear to be adequate. Id. at ¶ 19. HL&P has assigned new personnel and reassigned personnel, further increasing HL&P's direct management involvement at STP and HL&P involvement in the construction and quality aspects of the Project. Id. HL&P established a "SAFETEAM" to enhance the identification, investigation, reporting and disposition of safety-related employee concerns. Id. at ¶ 20. A SALP report for the one year period ending November 30, 1983 rated HL&P as a "1" in three categories, "2" in five categories and "3" in three categories. Licensee performance is considered acceptable in all three categories (if it was unacceptable enforcement action would be instituted), but category "1" may merit decreased NRC attention, while category "3" requires increased attention by both the licensee and the NRC. The three areas rated "1" were "licensing activities", "piping systems and supports", and "electrical power supply and distribution". The three areas rated "3" were soils and foundations (discussed in Section X. B), corrective action and reporting, and material control (discussed in ¶ X.45). Id. at ¶ 22-23. The Staff noted much improvement in the area of corrective action and reporting over the past 18 months. Id. at

¶ 24. The NRC has reviewed Bechtel and Ebasco STP QA programs, including the formal QA Program Description, and the implementation of those programs during construction. The Staff found those QA programs to be adequate. Id. at ¶¶ 26, 36. The Staff noted that HL&P was aggressive and thorough in resolving problems or allegations and implemented prompt and thorough corrective actions. Id. at ¶ 32-34. The Staff concluded that HL&P has demonstrated excellent involvement in both transition and restart activities, and cited increased HL&P involvement in the construction and quality aspects of the Project since that time. Id. at ¶ 38.

X.38. In response to the Staff Affidavit, Applicants filed the joint affidavit of HL&P's QA Manager and its Licensing Manager, both of whom were well qualified to address the relevant issues. Joint Affidavit of Mark D. Wisenburg and James E. Geiger, dated February 22, 1985, (hereinafter Applicants' Affidavit), at ¶¶ 1-2. Applicants' Affidavit supplemented the information provided by the Staff with additional details, such as identities of key personnel hired by HL&P since Phase I (Applicants' Affidavit, at ¶¶ 5-12), improvements in areas addressed in the SALP report for 1983 (Id. at ¶¶ 13-15), the status of allegation investigation activities (Id. at ¶¶ 16-20) and the status of revisions to the QA Program Description (Id. at ¶ 21).

X.39. CCANP's February 25, 1985 response to the Staff Affidavit did not controvert any of the facts set forth in the Affidavit, but only argued that the procedure being followed by the Board was now unacceptable to CCANP. CCANP did not file any response to Applicants' Affidavit. In response to our order that the Staffs' and Applicants' affidavits be treated in the manner of a motion for summary disposition, and that CCANP have yet another opportunity to reply, identifying specific material facts at issue in Phase II, CCANP filed its April 25, 1985 "Citizens Concerned About Nuclear Power (CCANP) Response to Applicants and Staff Motion for Summary Disposition." (Hereinafter CCANP Response).

X.40. CCANP's Response did not raise any specific facts undercutting the contents of those affidavits or tending to show a lack of competence by HL&P, Bechtel or Ebasco, and was not supported by affidavits or any other admissible evidence. Instead, it relied entirely upon various documents which have long been available to the parties in this proceeding, and of which the Staff and Applicants were clearly aware when they submitted their affidavits, but which CCANP apparently interprets differently than the Staff and Applicants. CCANP offered no factual basis for its interpretations other than the arguments of its representative. Such arguments, standing alone, are not entitled to any weight in ruling on a motion for summary judgment. Houston Lighting & Power Co. (Allens Creek Nuclear

Generating Station, Unit 1), ALAB-629, 13 NRC 75, 78 (1981); Virginia Electric Power Company (North Anna Nuclear Power Station, Units 1 and 2), ALAB 584, 11 NRC 451,453 (1980).

X.41. Furthermore, in making its arguments, CCANP frequently distorted the plain meaning of the words of the documents it relied upon. For example, CCANP claimed that I&E Report 83-12 "states that HL&P upper management does not review QA audits for substance." CCANP Response at 24. In fact, this report states: "The use of QA reports by HL&P upper management was not reviewed except to note the distribution of the reports." I&E Report 83-12 at 11. CCANP's remaining claims were not supported by specific facts. For example, CCANP contended that several items noted in I&E Reports should have been reported under Section 50.55(e), but provided no factual analysis showing why these items should have been reported. CCANP Response at 18-20. Much of CCANP's argument consisted of unsupported criticism of NRC Staff procedures and inspection methods which are simply inapposite to the issues before this Board. See CCANP Response at 14-18. Finally, some of the matters raised by CCANP related only to the competence of B&R, the former contractor, and were therefore outside the scope of the issues covered by the Staff's and Applicants' affidavits. See CCANP Response at 6-7. In short, CCANP's Response set forth no specific facts undercutting the Staff's and Applicants' affidavits, and cited no material information showing that HL&P, Bechtel or Ebasco have not performed competently.

X.42. In response to our directive that the Staff update its views on Applicants' competence at the hearing, it provided the testimony of Eric Johnson, George L. Constable, Claude Johnson, Dan Paul Tomlinson, Donald L. Garrison, and Danny R. Carpenter. Mr. Eric Johnson is Acting Deputy Director of the Division of Reactor Safety and Projects, NRC Region IV. His educational and professional background includes 10 years with the NRC in various inspection and enforcement positions. He is responsible for managing the NRC inspection program at STP through Mr. Constable, Chief, Reactor Project Section, Region IV. Johnson and Constable, ff. Tr. 14846, at 2-3. Mr. Constable's educational and professional background includes 10 years with the NRC in power reactor inspection and supervision of inspection. Mr. Claude Johnson, Mr. Garrison and Mr. Carpenter are the NRC Resident Inspectors at STP. Mr. Johnson received a Bachelor of Science Degree in Civil Engineering from Prairie View A&M University and is a Registered Professional Engineer. He has over 12 years of professional experience, including two years in the U.S. Marine Corps, six years as a Civil Engineer on various construction projects for TVA, B&R, and the Corps of Engineers, and four years as an NRC reactor inspector. He has been Senior Resident Inspector at STP since March 1985, and earlier performed inspections of STP during the period from February 1983 to July 1984. Johnson, ff. Tr. 15118, at 2, 4-6. Mr. Garrison also has been assigned to STP since March of 1985. His 29 years of industrial experience include a variety of QA/QC related respon-

sibilities in construction, manufacturing and laboratory settings. Approximately 12 years of that experience were in various QA/QC assignments in nuclear plant construction for B&R and Daniel Construction Company (including the position of QA Manager for Daniel at the J.M. Farley Nuclear Project). Garrison, ff. Tr. 15110, at 1, and Attached Professional Qualifications. Mr. Carpenter has been an NRC Resident Inspector at STP since 1983. He received a Bachelor of Arts degree in chemistry from the University of Washington, and has over 20 years of nuclear experience, including eight years in reactor operations in the U.S. Navy and 11 years in various QA/QC, management and engineering positions, working on various U.S. Department of Energy nuclear projects, such as FFTF, EBR-II and the nuclear waste programs. Carpenter, ff. Tr. 15114, at 1, 5-6. Mr. Tomlinson was the NRC Senior Resident Inspector at STP from September 1983 through February 1985. Tomlinson, ff. Tr. 15112, at 1. His 28 years of industrial experience include 24 years in QA/QC, of which 12 years were in nuclear applications. He has been an NRC inspector for seven years. Crossman, et al., ff. Tr. 10010, at attached Professional Qualifications of Dan Paul Tomlinson.

X.43. Since the NRC witnesses were the NRC managers and inspectors who have had the most direct contact with STP and have been in the best position to observe the Project, they were well qualified to give the NRC Staff's perspective on HL&P's current competence.

X.44. The NRC managers (E. Johnson and Constable) testified that Applicants have the competence that the NRC requires. They noted that the Staff's SALP review in 1984 for the period from December 1, 1982 through November 30, 1983, found the overall regulatory performance of HL&P satisfactory, and that since that time, HL&P's performance has improved. They stated that this improvement is "indicative of a high degree of management involvement in all site activities." Johnson and Constable, ff. Tr. 14846, at 12. The resident inspectors echoed this view. Mr. Carpenter expressed the view that the Applicants and their contractors are performing competently and with due regard for safety-related issues and concerns. Carpenter, ff. Tr. 15114, at 4. He noted a steady increase in the involvement of HL&P in most of the Project activities and cited the addition of key management and supervisory personnel with extensive experience. Id. at 3. He found that safety and quality concerns receive an acceptable level of attention. Id. Mr. Carpenter particularly noted HL&P's establishment of a Project Compliance Group (PCG), a multidisciplinary team assigned to assure that Staff open items are properly addressed. He found the PCG effective in getting the proper level of management attention to open items and cited the Group as an example of HL&P's commitment and increased attention to construction and safety at STP. Id., at 3-4. Similarly, Mr. C. Johnson testified that, in the period he inspected STP in 1983-84, HL&P's performance had been satisfactory. Since becoming senior resident inspector in March, he has observed

continued improvement. Johnson, ff. Tr. 15118, at 2-3; Tr. 15179-80 (C. Johnson). He particularly cited HL&P management involvement in the day-to-day decision-making activities on the Project. Johnson, ff. Tr. 15118, at 2. Mr. Tomlinson also testified that when he was Senior Resident Inspector, he observed that HL&P and its contractors performed competently and with due regard for safety-related issues and concerns. He particularly cited the expeditious and thorough corrective actions of HL&P and its contractors in response to identified concerns. Tomlinson, ff. Tr. 15112, at 2-3; Tr. 15170 (Tomlinson).

X.45. Cross-examination of the Staff witnesses by CCANP did not elicit any evidence contrary to their direct testimony. We questioned the resident inspectors about their current views of Applicants' performance and their answers were consistent with their prefiled testimony. They could identify no significant deficiencies in HL&P's performance. Cf. Tr. 15180 (Carpenter). Mr. C. Johnson testified that HL&P continues to improve on its own initiative, citing improvements in every area he has observed, and noted that he had not observed any deficient areas. Tr. 15175 (C. Johnson). Mr. Tomlinson also testified to improvements during the time he was on the Project. Tr. 15165 (Tomlinson). The Board particularly asked about the materials control area, which had been rated as a "3" (performance satisfactory but in need of increased management attention) in the 1984 SALP report. Mr. Carpenter testified that corrective actions had been taken by Applicants in the areas of marking of

materials, control of materials and the warehouse area, and expressed the opinion that Applicants have taken appropriate corrective action. Tr. 15177-78 (Carpenter). Mr. Garrison also expressed the view that Applicants have an acceptable level of competence. Tr. 15164 (Garrison). In response to Board questions, Mr. C. Johnson indicated that there were no additional areas in which improvements were needed. Tr. 15174-75 (C. Johnson). Finally, Mr. C. Johnson expressed the view that if he had to assign a SALP rating to HL&P's current overall level of performance, he would assign a high rating, between "1" and "2". Tr. 15174, 15185 (C. Johnson).

X.46. In LBP-84-13 we reached preliminary conclusions on the technical competence of HL&P and its contractors based on the organization, written programs, and the past performance of Bechtel and Ebasco on other projects. 19 NRC at 694-97. Based on the Staff's report and the uniform and uncontradicted testimony of the NRC Staff witnesses, the views expressed in LBP-84-13 need no longer be viewed as preliminary. Accordingly, based on the total record in Phase I and Phase II, we now conclude that the HL&P, Bechtel and Ebasco QA/QC organizations and practices meet the requirements of 10 C.F.R. Part 50, Appendix B, and that there is reasonable assurance that the QA program for STP will be implemented so that construction of the STP will be completed in conformance with the construction permits and other applicable requirements.

XI. CONCLUSIONS OF LAW

Based upon the foregoing Findings of Fact and upon consideration of the entire evidentiary record in this proceeding, including the record of both Phase I and Phase II of this hearing, the Board makes the following conclusions of law:

(1) The record in Phase II supports conclusions of law (1) through (5) made by the Board in its Partial Initial Decision of March 14, 1984 (19 NRC at 831-32) and provides no basis for any change in such conclusions.

(2) The Board hereby reaffirms each of the foregoing conclusions of law as of this date.

(3) Although one contention (Intervenors' Contention 3) and one CLI-80-32 issue (Issue F) remain to be heard in Phase III of this hearing, the foregoing five conclusions of law are not subject to change based on the record to be developed in Phase III, except to the extent that the record on Issue F may affect the Board's conclusion (5) as to HL&P's managerial competence to operate the STP safely and in compliance with all applicable NRC requirements.

ORDER

On the basis of the foregoing Findings of Fact, Conclusions of Law and Opinion, and the entire record, it is, this ___ day of _____, 1985

ORDERED:

1. To the extent that CLI-80-32 Issues A through E and Intervenors' Contentions 1 and 2 were resolved in paragraph 1 of this Board's Order of March 14, 1984, subject to the terms and conditions set forth in the Board's Decision of that date, such terms and conditions have been satisfied, and such Issues and Contentions are resolved without reservation.
2. Contentions 9 and 10 and the issues relating to the current competence of HL&P and its contractors, including issue B/D-1, are resolved as set forth in this Decision.
3. In accordance with 10 C.F.R. §§ 2.760, 2.762, 2.764, 2.785, and 2.786, this Partial Initial Decision shall become effective immediately and will constitute, with respect to the matters resolved herein, the final decision of the Commission thirty (30) days after issuance hereof, subject to any review pursuant to the above-cited Rules of Practice. Any party may take an appeal

from this decision by filing a Notice of Appeal within ten (10) days after service of this Partial Initial Decision. Each appellant must file a brief supporting its position on appeal within thirty (30) days after filing its Notice of Appeal (forty (40) days if the Staff is the appellant). Within (30) days after the period has expired for the filing and service of the briefs of all appellants (forty (40) days in the case of the Staff), a party who is not an appellant may file a brief in support of, or in opposition to, any such appeal(s). A responding party shall file a single, responsive brief only, regardless of the number of appellants' briefs filed. [See, in particular, 10 C.F.R. § 2.762, as amended effective December 19, 1983, 48 Fed. Reg. 52282, 52283 (November 17, 1983).]

THE ATOMIC SAFETY AND LICENSING BOARD

Charles Bechhoefer, Chairman
ADMINISTRATIVE JUDGE

Dr. James C. Lamb
ADMINISTRATIVE JUDGE

Frederick J. Shon
ADMINISTRATIVE JUDGE

Appendix A

List of Phase II Witnesses and Prefiled Testimony

<u>Witness</u>	<u>Panel Cited as</u>
Sidney A. Bernsen	Bernsen/Lopez, ff. Tr. 13441
Danny R. Carpenter	Carpenter, ff. Tr. 15114
John T. Collins	(no prefiled testimony)
George L. Constable	Johnson and Constable, ff. Tr. 14846
Walter R. Ferris	Jordan, <u>et al.</u> , ff. Tr. 13645
Richard A. Frazar	Frazar, ff. Tr. 14412
Donald L. Garrison	Garrison, ff. Tr. 15110
Jerome H. Goldberg	Goldberg, ff. Tr. 11491
Robert F. Heishman	Heishman, ff. Tr. 14846 (follows prefiled testimony of Robert G. Taylor)
Claude E. Johnson	Johnson, ff. Tr. 15118
Eric H. Johnson	Johnson and Constable, ff. Tr. 14846
Don D. Jordan	Jordan, ff. Tr. 11908
Thomas J. Jordan	Jordan, <u>et al.</u> , ff. Tr. 13645
Alfredo Lopez	Jordan, <u>et al.</u> , ff. Tr. 13645
Frank Lopez Jr.	Bernsen/Lopez, ff. Tr. 13441
George W. Oprea	Oprea, ff. Tr. 14095
H. Shannon Phillips	Phillips (50.55(e)), ff. Tr. 15116 Phillips (Quadrex), ff. Tr. 15192
Jesse Poston	(no prefiled testimony)
Cloin G. Robertson	(no prefiled testimony)
Donald E. Sells	Sells, ff. Tr. 15190

Witness

Panel Cited as

Loren Stanley	Stanley, ff. Tr. 13047
James R. Sumpter	Sumpter, ff. Tr. 12699 Sumpter (supplemental), ff. Tr. 15357
Joseph I. Tapia	Tapia, ff. Tr. 13752
Robert G. Taylor	Taylor, ff. Tr. 14846 (follows prefiled testimony of Johnson and Constable)
Dan P. Tomlinson	Tomlinson, ff. Tr. 15112
Mark R. Wisenburg	Wisenburg, ff. Tr. 14514

Appendix B

List of Phase II Exhibits

<u>No.</u>	<u>Description</u>	<u>Date</u>	<u>Id.</u>	<u>In Ev.</u>
<u>Applicants' Exhibits</u>				
57	Handwritten notes re Quadrex preliminary review	4/13/81	11466	11661
58	Memo from J.H. Goldberg to J.R. Sumpter re Quadrex Review of B&R Engineering Problem Categorization, with handwritten notes.	4/15/81	11466	13050
59	Typed and handwritten notes by C.G. Thrash of Management Committee Meeting	4/27/81	11466	11662
60	Quadrex Report, "Design Review of B&R Engineering for STP"	5/81	11466	11487
61	Letter from J.H. Goldberg to E.A. Saltarelli re STP Quadrex Engineering Review	5/6/81	11466	11487
62	Letter from E.A. Saltarelli to J.H. Goldberg enclosing B&R review of most serious findings for reportability	5/8/81	11466	11487
63	Bechtel Power Corporation Report, "An Assessment of the Findings in the Quadrex Corporation Report"	3/82	13442	13460
64	Bechtel Power Corporation Final Work Package Report for Work Package EN-619, "Review of the Quadrex Report"	8/26/82	13463	Rej. (13470)
65	Letter from L. Stanley to J.R. Sumpter re STP ALARA review	3/16/81	13049	13049
66	Excerpt from STP Procedure Manual Revisions on Reporting Design and Construction Deficiencies to NRC (PLP-02, Rev. 5)	5/21/85	14515	14516

<u>No.</u>	<u>Description</u>	<u>Date</u>	<u>Id.</u>	<u>In Ev.</u>
66a	PLP-02, Rev. 6	7/25/85	14573	14574
67	Letter from J.H. Goldberg to R.D. Martin re Supplemental Response/Clarification to the Response to Notice of Violation, Inspection Report 83-24	7/30/85	13646	13652
68	Letter from G.W. Oprea to J.T. Collins re Programmatic Audit of Backfill Activities and Audit Summary	5/25/84	13646	13652
69	Handwritten notes re "New Cost and Schedule"	No Date	12163	12163
70	One page excerpt of C.G. Thrash typed notes on 6/26/81 Management Committee Meeting (p. 2143)	6/26/81	12675	Not Offered
71	Handwritten notes re ALARA review	3/13/80	12904	12905
72	Letter from R.L. Ashley to B.L. Lex re disposition of Brown & Root Quadrex comments On Bechtel Task Force Draft Report	11/24/82	13470	13473
73	Reports to NRC on Computer Program Verification		14808	14809
	Letter from G.W. Oprea to K. Seyfrit transmitting 1st Interim Report concerning Computer Program Verification	6/5/81		
	Letter from G.W. Oprea to K. Seyfrit transmitting 2nd Interim Report concerning Computer Program Verification	8/27/81		
	Letter from G.W. Oprea to J.T. Collins transmitting 3rd Interim Report concerning Computer Program Verification	12/18/81		
	Letter from G.W. Oprea to J.T. Collins transmitting 4th Interim Report concerning Computer Program Verification	4/22/82		

<u>No.</u>	<u>Description</u>	<u>Date</u>	<u>Id.</u>	<u>In Ev.</u>
	Letter from G.W. Oprea to J.T. Collins transmitting 5th Interim Report concerning Computer Program Verification	9/13/82		
	Letter transmitting 6th Interim Report	12/22/82		
	Letter transmitting 7th Interim Report	6/13/83		
	Letter transmitting Final Report	10/14/83		
74	Reports to NRC re HVAC		14809	14810
	Letter from G.W. Oprea to K. Seyfrit transmitting 1st Interim Report concerning HVAC	6/9/81		
	Letter transmitting 2nd Interim Report	7/29/81		
	Letter transmitting 3rd Interim Report	10/23/81		
	Letter from G.W. Oprea to J.T. Collins transmitting Final Report concerning the Fuel Handling Building HVAC Control Air System	4/8/82		
	Letter transmitting 4th Interim Report	5/26/82		
	Letter from G.W. Oprea to J.T. Collins transmitting 5th Interim Report concerning HVAC (isolation dampers)	8/6/82		
	Letter transmitting Final Report concerning HVAC	10/20/82		
	Letter transmitting Supplemental Report concerning HVAC	5/17/84		
75	Letter from G.W. Oprea to K. Seyfrit transmitting Final Report concerning Shielding Analysis Verification	6/5/81	14810	14810

<u>No.</u>	<u>Description</u>	<u>Date</u>	<u>Id.</u>	<u>In Ev.</u>
76	Letter from G.W. Oprea to J.T. Collins transmitting Response to Notice of Violation 82-02	9/9/82	14811	14811
77	NRC Staff Response to Licensing Board Memorandum and Order regarding the Reportability of Quadrex Report	8/24/84	15025	15032
78	Letter from E.H. Johnson to HL&P re I&E 84-12	11/23/84	15032	15034*

NRC Staff Exhibits

136	Special Inspection Report of the Quadrex Corporation, Report on Design Review of Brown and Root Engineering Work for the South Texas Project Units 1 and 2.--NUREG-0948.	1/7/83	14848	14849
137	Guidance - 10 CFR 50.55(e), Construction Deficiency Reporting.	4/1/80	14847	14848
138	Quality Assurance Requirements for the Design of Nuclear Power Plants--ANSI N45.2.11-1974.	1974	14860	14866
139	U.S. NRC Regulatory Guide 1.64--Quality Assurance Requirements for the Design of Nuclear Power Plants (Rev. 2).	6/76	14862	14863
140	Letter from G.L. Madsen to G.W. Oprea enclosing Investigation Report 82-02.	6/3/82	14863	14864
141	Letter from G.L. Madsen to G.W. Oprea enclosing Notice of Violation 82-02.	8/11/82	14864	14865

<u>No.</u>	<u>Description</u>	<u>Date</u>	<u>Id.</u>	<u>In Ev.</u>
142	STP Engineering Procedures Manual STP-DC-021-D Engineering Procedure for Engineering Design Deficiencies.	no date	15119	15120
143	General Project Requirements Reporting Significant Deficiencies, Federal Regulation 10 CFR Part 50.55(e) (Bechtel 2.20).	6/1/84	15120	15120
144	Review of Nonconformance Reports for Deficiency Evaluation WPP QCI 5.3 (Rev. 7).	5/22/85	15123	15123
145	PLP-02, Reporting Design and Construction Deficiencies to NRC (Rev. 5).	5/21/85	15123	Withdrawn (15125)
146	PSQP-A8, Trend Analysis Administration (Rev. 3).	2/15/82	15125	15127
147	PSQP-16.3, Project Specific Quality Assurance Procedure, Trend Analysis (Rev. 3).	3/19/85	15126	15126

CCANP Exhibits

71	Memorandum from D.G. Barker to C.G. Robertson re Procedure Deviations Concerning Reportable Deficiencies (including attachments).	6/12/81	11501	Not Admitted
72	Section 3 of B&R's Quality Assurance Manual (in effect in May 1981)	no date	14186	14450
73	Letter from J.H. Goldberg to E.A. Saltarelli re in-depth review of B&R technical activities on STP by Quadrex.	2/2/81	11615	11620-21
74	Handwritten notes by L. Stanley for briefing of HLP re Quadrex.	3/18/81	11624	11639

<u>No.</u>	<u>Description</u>	<u>Date</u>	<u>Id.</u>	<u>In Ev.</u>
75	B&R Assessment of the Quadrex Design Review of the STP (excerpt Quadrex Finding No. 4.1.2.1(b)).	4/82	11789	12023
76	Memorandum from D.D. Jordan to STP Nuclear File re meeting on 6/3 with Tom Feehan regarding Gibbs & Hill letter of intent and B&R's recruiting efforts.	6/3/81	11956	11960
77	Memorandum from D.D. Jordan to STP file re meeting with project partners and with Tom Feehan.	9/15/81	11975	11977
78	Handwritten note to Mr. Jordan by G.W. Oprea transmitting attached draft STP Report on Contractor Replacement dated 9/8/81.	9/11/81	11977	11985
79	Handwritten notes of D.D. Jordan re percent complete.	no date	12007	12013
80	Handwritten notes of D.D. Jordan for meeting with Jack Harbin.	9/18/81	12014	12018
81	Excerpt from B&R Quadrex Assessment re Quadrex Finding No. 4.3.2.1(n).	4/82	12027	12030
82	Quadrex Findings Previously Reported Under 10 CFR 50.55 (e).	no date	12064	Not Offered
83	Meeting Minutes re discussions among STP participants regarding replacement of Architect/Engineer and Construction Manager.	9/22/81	12217	12381
84	Excerpt from B&R Quadrex Assessment re Quadrex Finding No. 4.8.2.1(g).	4/82	12277	12284

<u>No.</u>	<u>Description</u>	<u>Date</u>	<u>Id.</u>	<u>In Ev.</u>
85	L. Sinkin drawings numbered 1-6.	no date	12292	Not Admitted
86	Letter from J.H. Goldberg to D.W. Halligan re HLP Comments on Bechtel Task Force Report South Texas Project Electric Generating Station.	4/7/82	12332	12404
87	Statement by J. Goldberg to D.D. Driskill and J.E. Gagliardo concerning Quadrex report (includes handwritten changes).	2/9/82	12337	12338
88	Slides for Quadrex presentation.	no date	12342	12345
89	Handwritten notes by J.H. Goldberg re STP Quadrex Engineering Review.	no date	12423	12424
90	Excerpt from J.H. Goldberg PUC Cross Examination pp. 1355-58.	10/84	12479	12481
91	Excerpt from J.H. Goldberg PUC Cross Examination pp. 1374-80.	10/84	12486	Not Admitted
92	Excerpt of Plaintiff's Specification of Claims and Issues (cover and pages 31-39).	12/17/84	12707	Not Offered
93	Letter from J.L. Hawks to J.L. Blau re Engineering Review of B&R.	3/20/81	12756	12760
94	Memorandum from A.B. Poole to M.E. Powell re Primary and Secondary Stress Intensity of 3.35m for Upset Loads.	3/31/81	12786	12787
95	Memorandum from M.E. Powell to L.R. Jacobi re IRC Meeting concerning the Primary and Secondary Stress Intensity for Upset Loads in the Design of the Containment Mechanical Penetrations M9, M13 and M17; April 24, 1981 (item #93).	4/27/81	12788	12794

<u>No.</u>	<u>Description</u>	<u>Date</u>	<u>Id.</u>	<u>In Ev.</u>
96	Memorandum from J.A. Signorelli to D. Prelewicz re Quadrex STP Review (attached Nuclear Analysis questions).	5/8/81	12799	Not Admitted
97	Memorandum from D.A. Prelewicz to J.A. Signorelli re NUS Responses to Quadrex STP Review.	5/11/81	12800	Not Admitted
98	Handwritten statement of Jim Sumpter to D.D. Driskill re Quadrex Review.	2/10/82	12861	12863
99	Letter from L. Stanley to L. Sinkin responding to 11/8 inquiry regarding Stanley participation in ASLB hearings.	11/12/83	13051	Rej. (13053)
100	Letter from L. Stanley to J.R. Sumpter responding to request for audit.	1/5/81	13058	13061
101	Letter from J.R. Sumpter to L. Stanley authorizing Quadrex review.	1/27/81	13061	13063
102	"Engineering Review Schedule" no date --2/10/81-4/2/81		13069	Not Offered
103	Letter from L. Stanley to J.R. Sumpter outlining format for Quadrex review.	2/13/81	13070	13071
104	Letter from L. Stanley to R.L. Ashley re draft Bechtel Task Force Report.	3/2/82	13128	13309
105	Letter from L. Stanley to J.L. Wray re HLP/B&R 10CFR21 Reporting Requirements, and attached memo.	5/18/81	13205	Not Admitted
106	Cover letter from T.J. Jordan to L.W. Hurst transmitting STP audit report no. C11-401, with CAR G-508 attached.	10/4/84	13680	13681

<u>No.</u>	<u>Description</u>	<u>Date</u>	<u>Id.</u>	<u>In Ev.</u>
107	Closed version of CAR G-508.	10/24/84 (HL&P closure date)	13683	13683
108	STP Management Committee Meeting Minutes of February 19-20, 1981.	2/19-20/81	14104	14107*
109	STP Management Committee Meeting Minutes of March 19-20, 1981	3/19-20/81	14110	14113*
110	STP Management Committee Meeting Minutes of April 27, 1981	4/27/81	14115	14117*
111	STP Management Committee Meeting Minutes of June 26, 1981 (including meeting exhibit 13)	6/26/81	14122	14125*
112	Excerpts of C.G. Thrash type-written and handwritten notes of STP Management Committee Minutes of 6/26/81	6/26/81	14125	14133*
113	STP Management Committee Meeting Minutes of July 23-24, 1981 (including meeting exhibit 9)	7/23-24/81	14142	14243*
114	Excerpt of J.B. Poston handwritten notes of 4/27/81 Management Committee Meeting		14291	Not Admitted
115	Letter to Karl Seyfrit from G.W. Oprea re STP Safety Related Activities to continue during Transition Phase (including attachments A and B).	10/16/81	14306	Not Admitted
116	Handwritten notes of George Oprea for 7/2/81 Oprea, Goldberg, Saltarelli and Rice meeting.	undated	14314	14322
117	Letter from J.R. Newman to G.W. Oprea transmitting draft report on contractor replacement for architect-engineering and construction management services at STP.	9/8/81	14326	14327

<u>No.</u>	<u>Description</u>	<u>Date</u>	<u>Id.</u>	<u>In Ev.</u>
118	Agreement Not To Assert Certain Defenses (Executed Tolling Agreement).	12/28/79	14330	14349
119	Handwritten notes of G.W. Oprea of September meetings.	undated	14339	Not Admitted
120	Meeting minutes of 9/15/81 meeting re possible Replacement of B&R as engineer and construction manager.	9/22/81	14350	14370*
121	Confidential B&R office memo from K.M. Broom to W.M. Rice re Telephone call to George Oprea of 9/22/81.	9/22/81	14371	14837
122	Statement of G.W. Oprea to D.D. Driskill re B&R and the Quadrex Report.	2/12/82	14377	14377
123	Letter from R.A. Frazar to T.H. Gamon re Audit of B&R Engineering, Audit No. BR-28 (transmittal letter).	9/27/79	14423	14429
	Memorandum from T.D. Stanley to D.G. Barker re Audit No. BR-28.	10/1/79		
	Memorandum from R.A. Frazar to E.A. Turner re Audit No. BR-28 (transmittal letter).	10/1/79		
	Audit No. BR-28	9/4-7/79		
	Letter from R.A. Frazar to T.H. Gamon re B&R response to Audit BR-28 (with attachments).	12/26/79		
	Memorandum from D.R. Valley to T.D. Stanley re Resolution of Audit Findings of B&R Audit No. BR-28.	2/31/80		

<u>No.</u>	<u>Description</u>	<u>Date</u>	<u>Id.</u>	<u>In Ev.</u>
124	Memo to R.L. Ulrey from B.J. Fite re Auditor's Handbook on Deficiency Reporting (including enclosure).	1/21/81	14430	Not Admitted
125	Letter from R.L. Ulrey to R.J. Vurpillat transmitting Audit No. BR-35.	10/24/80	14435	14444
	Memo from R.L. Ulrey to G.W. Oprea transmitting BR-35.	10/24/80		
	Audit No. BR-35.	9/22-26/80		
126	HL&P QA Manual, Controlled Manual No. 70, with Phil D. Franke noted as manual holder. (excerpts from sections, 1 3 and 4 QA Program and South Texas QA Plan section 4)	Issued 11/10/78	14450	14453
126a	Project Quality Assurance Plan Project Engineering Section 4.0 (Revs 5 & 6).	10/29/80	15387	15387
127	C.G. Robertson handwritten notes from April, 1981	4/81	14591	14597
128	Telephone Minutes from M.E. Powell to L.R. Jacobi documenting call from M.E. Powell to W.A. Crossman notifying NRC of three potentially reportable items (HVAC, Computer Codes, Shielding Analysis).	5/8/81	14673	14674
129	Memo from M.E. Powell to L.R. Jacobi re Incident Review Committee Meeting Minutes of May 11, 1981 Meeting Concerning Computer Program Verification.	5/12/81	14675	14682
130	Memo from M.E. Powell to L.R. Jacobi re Incident Review Committee Meeting Minutes of May 11, 1981 Meeting Concerning Inadequate Design of HVAC Systems.	5/13/81	14685	14687

<u>No.</u>	<u>Description</u>	<u>Date</u>	<u>Id.</u>	<u>In Ev.</u>
131	Memo from M.E. Powell to L.R. Jacobi re Incident Review Committee Meeting Minutes of May 11, 1981 Meeting Concerning Verification of Shielding Analysis Calculations.	5/19/81	14687	14691
132	Memo from M.E. Powell to L.R. Jacobi re Incident Review Committee Meeting Minutes of June 1, 1981 Meeting Concerning Verification of Shielding Calculations.	6/4/81	14691	14695
133	Statement of Cloin G. Robertson to D.D. Driskill re Quadrex.	2/10/82	14704	14706
134	Letter from J.T. Collins to G.W. Oprea re NRC Report 81-37 SALP Board Report and letter from G.L. Madsen to G.W. Oprea enclosing SALP Report 81-37.	6/18/82	15005	15198*
135	Letter from E.H. Johnson to G.W. Oprea re Report on NRC Inspection 83-21.	11/25/83	15141	Not Offered
136	Letter from J.H. Goldberg to R.D. Martin re First Interim Report Concerning Record Packages for the 125 Vdc and 4KV AC Systems.	7/19/85	15148	15154
137	Evaluation of South Texas Project by Institute of Nuclear Power Operations (INPO).	4/85	15160	Not Offered
138	Memorandum for P.A. Bradford from W.J. Dircks re Chronology Related to The Quadrex Report on South Texas.	12/15/81	15206	15320
139	Handwritten Notes from H.S. Phillips to J. Collins re Design Engineering STP.	8/27/81	15211	15211

<u>No.</u>	<u>Description</u>	<u>Date</u>	<u>Id.</u>	<u>In Ev.</u>
140	Memorandum for File From W.G. Hubacek thru G.L. Madsen and W.A. Crossman re Meeting with HLP Management Related to Quadrex Review of B&R Engineering.	9/11/81	15212	15214
141	Handwritten Notes of D.E. Sells re potential 50.55(e) items and availability of Report.	No date	15215	15219
142	Memorandum for D.G. Eisenhut from D.E. Sells thru R.L. Tedesco and F.J. Miraglia re Summary of Quadrex Report-STP.	10/28/81	15219	Rej. (15221)
143	Meeting Summary of Meeting on 1/18/82 with HL&P by D.E. Sells.	1/26/82	15232	Not offered
144	Note to D.G. Eisenhut from D.E. Sells Thru R.L. Tedesco and F.J. Miraglia re Comments on South Texas Chronology.	1/26/82	15235	15428*
145	Letter from E.H. Johnson to G.W. Oprea re NRC Inspection Report 84-11 (enclosure inspection report).	9/11/84	15293	Not Admitted
146	Letter from G.W. Oprea to K. Seyfrit re Unlimited Re-Start for ASME Welding and Safety-Related Complex Concrete.	9/18/81	15311	Not Admitted
147	Testimony of Nunzio J. Palladino before Subcommittee on Energy and Environment of Committee on Interior and Insular Affairs U.S. House of Representatives.	11/19/81	15321	Not Offered
147a	Oversight Hearing--Cover page and pages 92-95.	11/19/81	15330	15330

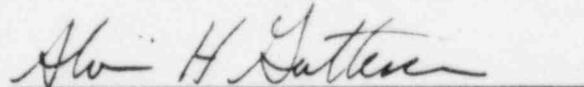
* Only an excerpt from the Exhibits designated with an asterisk has been admitted into evidence. Additionally, various Exhibits have been admitted only for a limited purpose. Accordingly, in each case, it is necessary to review the appropriate portion of the transcript to ascertain the scope of an Exhibit's admission.

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