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NUCLEAR REGULATORY COMMISSION
BEFORE THE ATOMIC SAFETY AND LICENSING APPEAL BOARD

In the Matter of)

PACIFIC GAS AND ELECTRIC COMPANY)

(Diablo Canyon Nuclear Power)
Plant, Units 1 and 2))
)
)
)

) Docket Nos. 50-275 O.L.
50-323 O.L.

POST-HEARING BRIEF OF GOVERNOR DEUKMEJIAN
IN SUPPORT OF HIS MOTION TO REOPEN THE RECORD
ON CONSTRUCTION QUALITY ASSURANCE

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As authorized by the Atomic Safety and Licensing Appeal Board, Governor George Deukmejian hereby submits the following brief on the Wolf Creek standard for reopening the record (Kansas Gas and Electric Company) (Wolf Creek Generating Station Unit No. 1) ALAB-462 (1978) 7 NRC 320) and on the relationship of the evidence before the board on the Governor's Motion to Reopen the Record on Construction Quality Assurance ("Motion") to that standard.

I

THE MOTION MUST BE GRANTED IF THERE
EXISTS AN UNRESOLVED SIGNIFICANT SAFETY ISSUE

Under the standard set forth in Kansas Gas and Electric Company (Wolf Creek Generating Station Unit No. 1) ALAB-462 (1978) 7 NRC 320, 338, and Vermont Yankee Nuclear Power Corp. (Vermont Yankee Nuclear Power Station), ALAB-138

(1973) 6 AEC 520, 523, a motion to reopen a record must be granted if the moving party has timely presented newly discovered evidence addressed to a significant safety issue and after a mini-evidentiary hearing on that evidence a triable issue remains, which, if resolved in the movant's favor, would change the result of the previous decision.

In Wolf Creek the standard for reopening was described in this fashion:

" . . . The motion must be both timely presented and addressed to a significant safety or environmental issue. Vermont Yankee Nuclear Power Corp. (Vermont Yankee Nuclear Power Station), ALAB-138, 6 AEC 520, 523 (1973); id., ALAB-167, 6 AEC 1151-52 (1973); Georgia Power Co. (Alvin W. Vogtle Nuclear Plant, Units 1 and 2), ALAB-291, 2 NRC 404, 409 (1975). Beyond that, it must be established that 'a different result would have been reached initially had [the material submitted in support of the motion] been considered.' Northern Indiana Public Service Co. (Bailly Generating Station, Nuclear-1), ALAB-227, 8 AEC 416, 418 (1974)." (7 NRC at 338.)

The precise test a board must apply to a timely motion to reopen raising a significant safety issue was explained in Vermont Yankee, supra, as follows:

"[t]he Board must . . . consider whether one or more of the issues requires the receipt of further evidence for its resolution. If not, there is obviously no need to reopen the record for an additional evidentiary hearing. As is always the case, such a hearing need not be held unless there is a triable issue of fact.

"In other words, to justify the granting of a motion to reopen the moving papers must be strong enough, in the light of any opposing filings, to avoid summary disposition. Thus, even though a matter is timely raised and involves significant safety considerations, no reopening of the evidentiary hearing will be required if the affidavits submitted in response to the motion demonstrate that there is no genuine unresolved issue of fact, i.e., if the undisputed facts establish that the apparently significant safety issue does not exist, has been resolved, or for some other reason will have no effect

upon the outcome of the licensing proceeding." (6 AEC at 523-524, footnotes omitted, emphasis added.)

In the present case, there is no real dispute that the Motion timely raised a significant safety issue. Neither Pacific Gas and Electric Company ("PG&E") nor the Nuclear Regulatory Commission ("NRC") staff have seriously challenged the fact that the Motion has been timely made. Similarly, because the Motion is based on evidence demonstrating that PG&E and its major subcontractors did not timely adopt and implement a quality assurance ("QA") program for construction of Diablo Canyon Units 1 and 2 which met the requirements of Appendix B to 10 C.F.R. part 50 ("Appendix B") and General Design Criterion 1 ("GDC-1") of Appendix A to 10 C.F.R. part 50 ("Appendix A"), there can be no question that the Motion addresses a significant safety issue. The dispute therefore focuses on whether the evidence establishes a "genuine issue of fact" (Vermont Yankee, supra, 6 AEC at 523).

The preceding analysis conforms fully to this board's own decision in Pacific Gas and Electric Company (Diablo Canyon Nuclear Power Plant, Units 1 and 2) ALAB 598 (1980) 11 NRC 876, setting forth a test for reopening the record that the Governor has plainly met. It is stated there that the test consists of an appraisal of the following:

"(1) Is the motion timely? (2) Does it address significant safety (or environmental) issues? (3) Might a different result have been reached had the newly proffered material been considered initially?" (11 NRC at 879, emphasis added.)

Under this test, if a timely motion raises a significant safety

issue, the record merits reopening even if the board is not certain that the new evidence would have led to a different result originally; the test requires only that the result might have been different.

A. The Failure of PG&E to Conform Its QA Program to Appendices A and B Satisfies the Requirement for an Unresolved Safety Issue

The evidence submitted with the Motion indicated that PG&E had failed to develop and to implement a QA program in compliance with Appendices A and B. The testimony at the hearing has corroborated the fact that, two years after the licensing board found PG&E's QA program to meet the quality assurance requirements of the commission's regulations, PG&E is still not committed to full compliance with the requirements of Appendix B for Unit 1 construction and has yet to develop a systematic QA program for systems, structures, and components ("SS&C's") important to safety but not safety-related, as required by GDC-1.

Furthermore, the testimony showed that PG&E's substitute for a lawfully sufficient CQA program has, through the years, failed to detect construction discrepancies and CQA breakdowns and has failed to determine the root causes of these discrepancies and breakdowns in a way that insures complete corrective action and effective preventative action. As a consequence, there can be no reasonable assurance that all past errors have been detected and corrected and that similar errors with work currently underway will be prevented or detected. Finally, the evidence adduced at the hearing has substantiated

the fact that the IDVP CQA review is unable to answer any questions about PG&E's compliance with the requirements of Appendix B or GDC-1 and offers no assurance that all significant errors in construction have been detected.

One further consideration affects the disposition of a motion to reopen: the extensiveness of the record sought to be reopened. Where the original record contains only sparse evidence on the issue, reopening properly requires a lesser showing. (cf. United States v. Walrus (7th Cir. 1980) 616 F.2d 283.) In the present case, the record on QA is wafer thin and thoroughly discredited - consisting of a half-day of self-serving testimony on both design and construction quality assurance that has been devastated by the last two years' disclosures of massive quality assurance failures.

B. An Adjudication Is Required on the Quality of Construction Post-Dating the 1977 Hearing

All of the foregoing concerns the standards for reopening the record. A good deal of the actual construction post-dates the 1977 hearing, the last opportunity any party had to offer evidence on QA. With respect to the quality of the subsequent work, the appropriate standard is not the same as for new evidence on old work. For that work for which there has never been an opportunity to contest quality assurance, it would be wholly inappropriate to dispose of contentions without discovery and a hearing. Insofar as the Governor's contentions are directed to the post-1977 work, they should be asserted like any other contentions in anticipation of a hearing.

II

THE HEARING BEFORE THIS BOARD HAS
SUPPLIED A CRUCIAL FACT ABOUT THE PG&E
QA PROGRAM: THE ABSENCE OF A COMMITMENT
TO COMPLY WITH THE REGULATIONS GOVERNING
QUALITY ASSURANCE

The evidence filed with the Motion demonstrated PG&E's failure to meet QA regulations by pointing out specific construction errors that went undetected by the QA program. As reviewed in part III, post, that evidence was, for the most part, substantiated by the evidence produced at the hearing on the Motion. But the hearing provided even more significant evidence: proof of the explicit avoidance by PG&E of a commitment to comply with NRC QA regulations in the construction of Unit 1, and the undisputed failure of PG&E to conform its QA program to those regulations. The hearing has thus provided the general explanation for the specific errors previously disclosed.

A. For Thirteen Years PG&E Has Failed to Conform Its QA Program for Unit 1 to the Requirements of Appendix B.

The key testimony was provided by Warren Raymond, PG&E's Manager of Quality Assurance from 1979 to June 1983. (PG&E Exh. CQ-6.) He testified that while Appendix B was adopted in 1970, PG&E never committed itself to comply fully with Appendix B for construction of Unit 1 - neither for the construction performed before 1970 nor for the work done in the thirteen years since Appendix B became effective. (CQ Tr., pp. 460-62, 464-65.) Instead, PG&E merely committed itself to comply with Appendix B "as practicable," a limitation that

purported to exempt PG&E from genuine, full compliance with Appendix B:

"Q . . . [D]o you understand the term 'as practicable' to mean that Appendix B applied to all unit 1 construction activities undertaken after Appendix B became effective?

"A (Witness Raymond) No, I did not.

". . . .

"Q . . . You understood, did you not, that there could be construction activities in unit 1, after Appendix B became effective, that need not comply with Appendix B?

"A Yes." (CQ Tr., p. 465.)

And, indeed, the work was continued after 1970 without full compliance with Appendix B. What work was performed in conformity with Appendix B? PG&E's own QA Manager for the past four years cannot say:

"Q And all we know about those construction activities is that it was not practicable to conform them to Appendix B?

"A It was not practicable for them to conform to the entire Appendix B requirements. However, there may have been provisions of Appendix B which could have been and were undoubtedly applied to those particular items. And we would have to go through an exhaustive review of what you are relating to in order to identify which of those provisions were covered by Appendix B, or which work was covered by Appendix B." (CQ Tr., pp. 465-66.)

(1) There is No Legal Justification for PG&E's Failure to Comply with the Regulations

The original purported basis for PG&E's "as practicable" qualification was the fact that construction on Unit 1 began before Appendix B became effective. (CQ Tr., p. 464.) PG&E's legitimate interests could have been protected

by limiting its commitment to Appendix B to construction performed after the effective date of the regulations. Instead, it chose the "as practicable" language - inviting the assumption that "as practicable" meant for work performed after 1970. In fact there is no evidence in the record of any correspondence between PG&E and the NRC on the meaning of the term; on the basis of the present record, it may well be that the staff did, indeed, take "as practicable" to mean "after the effective date of Appendix B." If so, the staff was gravely in error. To PG&E the phrase meant a leisurely stroll, spanning more than a decade, toward regulatory compliance.

Of course, the staff's possible mistaken acceptance of the PG&E commitment is of only casual interest for present purposes. If the staff really understood PG&E to be writing itself an indefinite exemption from Appendix B, the staff had no authority to grant PG&E dispensation from the commission's regulations. It is firmly established in the law that an agency is bound by its regulations and not at liberty to depart from them in administration. (United States v. Nixon (1974) 410 U.S. 683, 694-96; 2 Davis, Administrative Law Treatise (2d ed. 1979) § 7:21, p. 98 et seq.)

The hearing's disclosures about the failure of PG&E to conform its QA program to Appendix B sheds new light on the testimony of Virgil Tennyson about the QA program of H.P. Foley, a major construction contractor at Diablo Canyon.

In his testimony to the board, Mr. Tennyson confirmed his prior testimony that PG&E did not require Foley to comply

with Appendix B:

" . . . When 10 C.F.R. 50, Part B came up we would try to write procedures in accordance with the 18-point criterion [sic] and at various times were informed by possibly PG&E engineers and by my own management that we were not compelled by the whole 18-point criteria -- the Foley organization, that is -- that PG&E would specify the portions of it that we were to comply with and they would, in some way, cover it with their audits, the other parts." (CQ Tr., p. 13.)

We now know that the PG&E program that was to compensate for the deficiencies of the Foley program was itself deficient.

On cross examination Mr. Tennyson was specifically asked whether he agreed with the notion that the PG&E QA/QC audit department could bring the Foley CQA program into compliance with Appendix B. His testimony was as follows:

"I had to agree. I mean I disagreed personally but I didn't let that affect my judgment on doing a job." (CQ Tr., p. 289.)

(2) PG&E's QA Program Not Only Failed to Meet the Regulatory Standards But Also Failed to Meet the Standards in the Industry

It is impossible to assess, in the absence of a full hearing with discovery, the complete practical effects of the legal deficiencies on the PG&E QA program's performance.^{1/}

The QA program PG&E has to implement failed not only to meet

^{1/} Recognition of the "triable issue of fact" test does not preclude the kind of effort this board made at the July 19-22 hearing to resolve those issues on which there exists no bona fide factual dispute. Indeed, precisely such an undertaking in Vermont Yankee was employed to dispose of undisputed issues. But, as the board recognized in Vermont Yankee, it is not appropriate to resolve issues against a party that has been denied discovery if the party has shown that discovery may reasonably affect the resolution.

the regulatory requirements but also to conform to industry standards. For example, the American National Standards Institute (ANSI) adopted standards for qualifications of QA inspectors, ANSI N45.2.6, in 1973. (CQ Tr., p. 466.) The commission adopted WASH 1309 in 1974, establishing ANSI N45.2.6 as the nominal method of meeting the inspector qualification requirements of Appendix B. Yet PG&E did not commit itself to meeting ANSI N45.2.6 until July 1981 - and then only to be effective upon full power operation. (CQ Tr., pp. 479-80.)

The significance of PG&E's failure to meet the requirements of Appendices A and B are plain: The Governor has shown that no finding can be made that Diablo Canyon was designed and constructed in conformity with the commission's regulations on quality assurance. To the extent that the Atomic Safety and Licensing Board found otherwise in 1981, the present record demonstrates that that finding was wrong.^{2/} This uncontroverted evidence, in and of itself,

^{2/} At one point, PG&E witness Raymond, while reaffirming that PG&E's commitment was to less than full compliance with Appendix B (CQ Tr., p. 482), sought to avoid the implication that the licensing board's finding in 1981 was in error. Raymond's testimony varied - first to the effect that PG&E was in full compliance with Appendix B, then that he did not know of any deviation from Appendix B, and finally that he did not know whether the licensing board meant to refer to the early 1970's. (CQ Tr., p. 485.) Finally, he settled on the proposition that by 1981 PG&E was in full compliance but not in 1971. (CQ Tr., p. 486.) Accepting Mr. Raymond's testimony on this issue at face value, he is saying the licensing board was correct concerning the 1981 program but in error in saying the program "has been . . . in compliance with . . . Appendix B" throughout the eleven years before the decision during which Appendix B was in effect.

meets the Wolf Creek standard by showing that a different result is required.

B. PG&E Has Also Failed to Adopt Any Program to Comply with the Requirements of GDC-1 of Appendix A

The record also shows a failure to comply with GDC-1 in the construction of Diablo Canyon. Despite the fact that Appendix A and GDC-1 have been in effect for well over a decade, setting forth the QA requirements for SS&Cs that are important to safety but not safety-related, at the hearing PG&E QA officials were quite unable to list (or even to generally describe) those items at Diablo covered by GDC-1, as shown by the following exchange.

"Q Are there structures, systems or components important to safety for purposes of Appendix A that are not Class 1 classification at Diablo Canyon?

"A (Witness Raymond) I would have to go back to the Engineering Department listing in order to really give you a satisfactory answer on that. I would be very reluctant to say right now because some of my own personal opinion would enter into that.

"Q Does any member of the panel know the answer to that question?

"(No response.)" (CQ Tr., p. 488.)

PG&E personnel were able to list certain items not safety-related that are covered by QA procedures (i.e. the fire protection system, certain seismic systems (CQ Tr., p. 489), and portions of the component cooling water system (CQ Tr., p. 583)). Beyond those few systems and components, however, PG&E was unable even to denominate the items at Diablo to which GDC-1 applies. It does not claim that, aside from a few exceptions, any systematic QA program is applied to these

important to safety items. PG&E most certainly does not claim that a program complying with GDC-1 is being applied to them. Indeed, PG&E personnel hardly seemed to recognize the relevance of the question or the requirement.

In its turn, the NRC staff exhibited a similar lack of knowledge of the existence or characteristics of any PG&E QA program for items important to safety but not safety-related. The Deputy Regional Administrator and the Senior Resident Inspector at Diablo offered conflicting testimony as to whether PG&E had such a program, with the resident inspector able to name only one system covered by it -- the previously mentioned fire protection system. (CQ Tr., p. 819.)

The staff's ignorance about Diablo is explainable by the statement of Mr. Haass that the agency devotes almost no resources to enforcing Appendix A and GDC-1. As Mr. Haass stated:

"... [G]enerally speaking, our inspection program is directed toward the determination of conformance to Appendix B with regard to quality assurance, and therefore it is directed toward safety-related items in the plant; namely, those needed to prevent accidents or mitigate their consequences.

As far as an inspection program, we devote practically no attention to the other items in the plant because they are considered of lesser significance to safety...." (CQ Tr., p. 814.)

Given this on-the-record attitude by both PG&E and the staff that, essentially, Appendix A and GDC-1 were items of little or no import, this board has reason to believe that these regulatory requirements were met at Diablo Canyon.

III.

THE HEARING CONFIRMED THE EVIDENCE TENDERED BY THE GOVERNOR SHOWING WIDESPREAD FAILURES OF THE PG&E QA PROGRAM

The Motion, as filed, necessarily cited little direct evidence of the general deficiencies of PG&E's QA program. Given the absence of discovery and little opportunity to probe the program itself, the Motion relied in large measure on the known evidence of construction deficiencies and the implications of those deficiencies.

For the most part, the hearing confirmed the existence of those deficiencies and demonstrated the absence of any explanation for the errors other than an inadequate quality assurance program.

A. PG&E Witnesses Validated the Assumption Underlying the Inference of QA Deficiencies in Construction from the Known Design Errors

The board will recall that the Governor had originally moved to reopen the record on quality assurance at Diablo Canyon -- without distinction between design and construction QA. The scope of the motion was determined in part by the conviction that the widespread and notorious errors in design are themselves evidence of inadequacies in the QA process that are likely to have infected the construction process as well. The Governor continues to maintain that the distinction urged by PG&E between design and construction is artificial, arbitrary, and likely to lead to a balkanized review of the entire quality assurance process that invites confusion and

omissions. The evidence adduced at the hearing supports the treatment of the quality assurance process as a single matter and supports the inference that the design errors imply deficiencies in the QA process that apply to the construction of the facility.

The Motion relied on the past testimony of the NRC staff that the root cause of past quality assurance deficiencies had been the absence of an adequate commitment by the utility's top management to a vigorous, effective quality assurance process. PG&E witness Charles W. Dick also expressed a reliance on managerial attitude when he testified that he based his confidence that quality of construction had been assured on his finding of management support for quality assurance. (CQ Tr., pp. 370-71.) But when asked to compare the commitment of PG&E management to quality assurance in design and quality assurance in construction, Dick testified he found an equivalent commitment by PG&E management to construction QA and design QA. (CQ Tr., pp. 403, 407.)

Thus, PG&E's own witness acknowledged that the management commitment to construction quality assurance was the same as the commitment to design quality assurance -- which produced a QA program that failed to detect scores of errors involving thousands of physical installations. The Dick testimony, taken together with the NRC's finding that quality assurance failures derive from an inadequate management commitment to quality assurance, corroborate the inference advanced in the Motion that the inadequacies of the QA program

likely afflicted both design and construction.

The PG&E witnesses offered other evidence of the artificiality of the distinction between design QA and construction QA. For example, PG&E had a single "controlling and overall quality assurance program" that covered both design and construction. (CQ Tr., p. 369.) A single Manager of Quality Assurance oversaw the QA program for both design and construction. The PG&E QA Manual came in two volumes, both of which were addressed to both design and construction QA. The manual referred to a single QA policy, directed to both design and construction. And the contractor retained to oversee the completion of Diablo Canyon has a single "project completion manager," responsible for both design and construction. (CQ Tr., p. 397.)

In an effort to avoid the logical inference from the design errors, PG&E sought to emphasize the differences between design and construction, and between quality assurance programs for the two. Thus, PG&E witnesses testified that QA is easier to perform for construction than for design (CQ Tr., pp. 370, 392), although not necessarily (CQ Tr., p. 392). They pointed out that the industry had greater experience in construction QA than in design QA. (CQ Tr., pp. 370, 372-73.) And they observed that construction QA had more redundancy than design QA. (CQ Tr., p. 372.) While one witness testified that, in his experience, design QA errors have not been accompanied by construction QA errors (CQ Tr., p. 373), there is no evidence of the plants on which that observation was based -- in

particular, whether his experience includes any other facility with the monumental history of design QA failures of Diablo Canyon.

The only direct evidence on this point was offered by the NRC staff in questioning about the initial Reedy Report (Gov. Exh. CQ-55). Reedy had found among the systematic failures of the PG&E QA program for design that the company failed to perform periodic assessments of the design QA program implementation, as required by Appendix B. The staff conceded that the very same failure also characterized the construction QA program. (CQ Tr., pp. 870-72.)

Taken together, the evidence establishes conclusively only one fact: that the single quality assurance program at Diablo Canyon produced a seriously defective design. PG&E has offered evidence about the nature of construction and design quality assurance in an effort to demonstrate that design QA breakdowns may not be accompanied by similar breakdowns in construction QA. Evidence to the contrary has been introduced. Given the state of the record and the limited opportunity for further evidence without discovery, the board is certainly not at liberty at this stage to disregard the design errors in assessing the evidence of a need to reopen on both design and construction quality assurance.

B. The Hearing Corroborated the Existence of Numerous Errors in Construction Quality Assurance

In the four days of hearings, the evidence of the numerous construction errors cited in the Motion was, in nearly

every case, substantiated. As is so often the case with Diablo Canyon, some of the issues changed during the proceeding, as new consultants rushed in new reports, with ink still wet, resolving some issues and raising new ones. But the key contentions of the Motion were substantiated by the testimony presented.

- (1) It Is Now Clear That the QA Program of H.P. Foley, A Principal Construction Contractor at Diablo Canyon, Was Utterly Incapable of Performing Its Function

During the hearing it was conceded that the Foley CQA program had broken down with respect to welding done in the Unit 1 fuel handling building. PG&E admitted that fully 14% of the fillet welds performed and inspected by Foley during the latest "big push" were subsequently found to be unacceptable. It was also conceded that this error rate reflected an inadequate performance of the quality assurance program. (CQ Tr., p. 562.) Previously, and during the hearing, it was conceded that these non-conformances were caused by inadequately trained welders, unqualified inspectors and understaffing of inspectors. (CQ Tr., pp. 567-68.) PG&E also confirmed that during an ongoing review of fillet welds in the Unit 1 annulus, after 70% of the inspection was complete approximately 3% of those welds were turning out to be unacceptable. (CQ Tr., p. 557.)

PG&E blamed this breakdown in the Foley CQA program on Virgil Tennyson (CQ Tr., pp. 569-570) and said that PG&E's discovery of some of the fillet weld non-conformances proved

that its CQA program was working. The NRC staff, however, testified that it had issued a notice of violation to PG&E citing the bad fillet welds found in the fuel handling building because the resident inspector did not believe that PG&E's QA program had made the "judgment that there was a widespread serious problem in the area." (CQ Tr., p. 826.)

For PG&E now to concede even that there has been a problem with the Foley work is itself a major change of position. This past April, counsel for PG&E told this board that there was no evidence of any problems with construction quality assurance (see Transcript of April 14, 1983, p. 201) -- a month after the NRC had cited PG&E for the faulty Foley welding (Gov. Exh. CQ-53) that PG&E claims it had already uncovered itself (CQ Tr., pp. 562-65).

- (2) The Evidence Discloses That the Recent Deficiencies in the Foley Program Are, in Fact, Merely Part of a Long History of QA Breakdowns in Welding at Diablo Canyon

While the evidence of the recent deficiencies in the Foley welding work is most vivid, it does not follow that the QA problems are isolated to the recent Foley work. To the contrary, the record reflects a recurring pattern of QA failures in the welding work at Diablo Canyon -- a pattern well documented by the NRC inspection reports on Diablo Canyon.

Despite the fact that both PG&E and the NRC staff witnesses sought to imply that welding problems were confined to Foley because it was handling a variety of work rather than a specialized contract (CQ Tr., pp. 573, 836-838), the NRC

staff investigation reports demonstrate conclusively that Kellogg-Pullman and Wismer and Becker as well as Foley were having welding and welding related problems which had gone undetected by PG&E's CQA program.

The NRC inspection reports detail that many of the welding problems experienced by Foley in 1983 were earlier experienced by Pullman-Kellogg. NRC Inspection Report No. 50-323/76-01 (Gov. Exh. CQ-10) points out virtually the same sorts of problems with welding later found at Foley: slag, poor workmanship, lack of welder's identification stamp, and undercut. Similarly, NRC Inspection Report No. 275/77-17, 50-323/77-07, dated August 17, 1977 (Gov. Exh. CQ-28), at pages 7-9, lists several problems with undercut, arc strike, uninspected or poorly inspected welds, and poor workmanship. NRC Inspection Report No. 50-275/79-12, 50-323/79-07, dated June 1, 1979 (Gov. Exh. CQ-41) at page 7, cites Pullman-Kellogg problems with two to three welders not properly qualified, whose improper qualifications were not detected by either the contractor's or PG&E's QA programs, but rather by NRC inspection. NRC Inspection Report No. 50-275/77-19, dated October 20, 1977 (Gov. Exh. CQ-29), details numerous weld problems with Pullman-Kellogg welds, where welds had not been inspected before acceptance. Again, neither the contractor's nor PG&E's QA programs had originally detected these welding problems.

Pullman-Kellogg has had many other serious problems, including: (1) rusting of steel weld joints (NRC Inspection

Reports Nos. 50-275/72-03 (Gov. Exh. CQ-4), 73-01 (Gov. Exh. CQ-5), 73-03 (Gov. Exh. CQ-4), 73-07 (Gov. Exh. CQ-7)); (2) nonconforming stub tube welds (NRC Inspection Reports Nos. 50-323/76-01 (Gov. Exh. CQ-10) and 76-02 (Gov. Exh. CQ-11)); (3) difficult-to-resolve problems with pipe hangers in Unit 2 (NRC Inspection Reports Nos. 50-323/76-01 (Gov. Exh. CQ-10), 76-02 (Gov. Exh. CQ-11), 76-03 (Gov. Exh. CQ-13), 76-05 (Gov. Exh. CQ-15), 77-01 (Gov. Exh. CQ-18), 77-03 (Gov. Exh. CQ-20), 77-06 (Gov. Exh. CQ-22), 77-08 (Gov. Exh. CQ-23), 77-11 (Gov. Exh. CQ-25), 78-02 (Gov. Exh. CQ-32), 78-07 (Gov. Exh. CQ-35), 78-12 (Gov. Exh. CQ-37)) and Unit 1 (NRC Inspection Reports Nos. 50-275/76-06 (Gov. Exh. CQ-16), 76-14 (Gov. Exh. CQ-17), 77-03 (Gov. Exh. CQ-19), 77-11 (Gov. Exh. CQ-24), 77-22 (Gov. Exh. CQ-30)); (4) questionable shop welds (NRC Inspection Report No. 50-275/76-01 (Gov. Exh. CQ-12)); (5) numerous different problems with welding records (NRC Inspection Report Nos. 50-275/77-06 (Gov. Exh. CQ-21), 50-275/77-17 (Gov. Exh. CQ-28), 50-275/83-20 (Gov. Exh. CQ-54)); and (6) other piping weld problems (NRC Inspection Report No. 50-323/77-08 (Gov. Exh. CQ-23)). The welding work of Wismer and Becker likewise was found to be non-conforming by the NRC staff in Inspection Report No. 50-323/77-08. (Gov. Exh. CQ-23.)

The typical PG&E response to a notice of violation from the NRC with respect to a welding non-conformance is found in PG&E's May 14, 1976, response to Inspection Report No. 50-323/76-01 (Gov. Exh. CQ-10). This report recites the following curative measures and analysis: Only an isolated

welder was involved, a reinspection of his work would be done, the contractor's procedures would be corrected, and PG&E would monitor the contractor's program more carefully. PG&E's analysis of this incident for the Pullman-Kellogg Company in 1976 and approved by the NRC staff, is strikingly similar to its present response to the Foley welding errors.

Clearly, PG&E's corrective action was not sufficient to correct the problem because similar welding errors continued to occur in Pullman work after that 1976 report and have recurred in Foley's current work.

However, at the hearing the PG&E/NRC staff explanation for the cause of these recurring failures changed, being typified by testimony which sought to suggest that a rash in welding errors was a cyclical problem which must inevitably occur whenever new workers, new inspectors and/or new NRC inspectors are brought on board. (CQ Tr., pp. 805-807.) It was also suggested that welding errors were caused by PG&E welding standards which were higher than normal in the industry (CQ Tr., p. 567) and workers' and inspectors' unfamiliarity with those standards.

What can be said about a corrective action program which keeps finding and correcting the same errors over and over again? Clearly not that it is working.

- (3) PNOs 21 and 22A Confirm PG&E's Continued Failure to Appreciate the Requirements of an Effective QA Program

The Motion had cited PNO-V-83-21, concerning discovery of a leak in the component cooling water system, and

PNO-V-83-22A, originally concerning suspected thin welds in the reactor coolant system, as further evidence of construction QA problems.

PNO-21 remains unresolved. The evidence presently available indicates that the leak was caused by lack of fusion in the root pass of a full penetration weld. (CQ Tr., p. 584.) According to PG&E, which dismisses the incident as "an acceptable defect" (CQ Tr., p. 587), both the design and construction QA personnel complied fully with procedures. (CQ Tr., pp. 584, 587.) Nevertheless, the weld leaked. The defect was hidden by a fillet weld that was ground away at the direction of PG&E Engineering in order to accomplish a seismic design modification; no nondestructive examination was performed sufficient to discover the defect. The incident thus illustrates the failure of the PG&E QA program to detect construction errors in old work caused by the new round of modifications -- even when the work involved grinding directly on the old installation. (CQ Tr., p. 587.)

PNO-22A demonstrated the fluidity of the present status of the plant. Welds that had, for six months, been suspected of being too thin turned out not to be undersized. Instead, it was discovered that for six months PG&E had been trying to confirm the possible construction error using a measurement technique, ultrasonic measurement, that was inappropriate to measure the pipes in question. (See generally PG&E Exh. CQ-1.) Thus, while the originally feared error proved not to exist, a new violation of Appendix B was

disclosed: the use of tests in violation of criterion 9.

The misapplication of ultrasonic is not a matter of idle interest. In this case, it turned out that the measuring technique was systematically biased in the conservative direction. The question the incident naturally raises is whether there exist corresponding errors elsewhere, where PG&E has used tests that systematically overestimated margins of safety -- the kind of errors whose bias makes their detection all the more difficult.

(4) The Recurring Problems of Physical Installations
Deviating from Design Documents Cannot Be
Dismissed by Convenient Compartmentalization

The Motion cited the PG&E response to Bulletin 79-14, in which numerous deviations from design drawings were revealed in a physical examination of the installation, as additional evidence of QA failures in construction.

PG&E's response has not been to dispute the demonstrated inadequacies but rather to assign them to the design, rather than construction, program. That may be a characterization convenient to PG&E, but it is not one constructive to a fair examination of the problem. The issue remains whether the procedures for construction quality assurance are defective because they do not require the construction department to verify that design drawings conform to the actual installations.

This question is all the more pertinent because Bulletin 79-14 was not the last such occurrence. R.L. Cloud and Associates discovered numerous discrepancies between

installations and design drawings. (See Hubbard Affid., Nov. 11, 1981, p. 24.) Indeed, even the Independent Design Verification Program (IDVP) has found such deviations. (See, e.g., ITR-38, Rev. 2, (PG&E Exh. CQ-4), p. B-19.)

Where the quality assurance program demonstrates a continuing inability to correct the recurring problem of discrepancies between design documents and physical installations, the commission cannot accept a defense built on different components of the same program pointing the finger at one another. The fact is undeniable that the PG&E QA program has erred, and that other, equally important errors may remain undetected by this deficient QA program.

(5) The Recent Disclosures About the Foley Company
Raise New Questions About the Quality of the
Electrical Work Performed by That Company

The Foley Company was originally retained as the electrical contractor for Diablo Canyon, in the early 1970s. (CQ Tr., p. 835.) Although the evidence at the hearing focused on Foley's subsequent work in structural steel, new questions were raised about the adequacy of its QA program for the early electrical work.

In its report on the allegations of Tennyson and Roam, the staff investigated the claim that Foley had only three QA audit/inspector personnel to monitor the work of 200 to 300 electrical workers. The report concluded that the allegation was not substantiated. However, during the hearing the staff was forced to concede that one of its own inspection reports (Gov. Exh. CQ-9) substantiated the claim. (CQ Tr.,

pp. 828-36.) As a result, the true ratio of inspectors to craft workers was one inspector for every 66 to 100 construction workers.

The NRC staff report on the Tennyson-Roam allegation agonized over the difficulties of setting precise numerical standards for the proper craft-inspector ratio. The report implies that the proper ratio lies somewhere in the range encountered in the industry -- one inspector for every seven to twenty-six craft workers. Whatever difficulties the staff has assessing a ratio falling within that range, it should have little problem evaluating a ratio three or four times higher than the upper bound of the industry experience.

IV.

THE IDVP REVIEW OF CONSTRUCTION QUALITY ASSURANCE IS INCAPABLE OF ALLAYING CONCERNS OVER THE QUALITY OF CONSTRUCTION

Under Wolf Creek, the demonstrated failure of PG&E to have a quality assurance program that meets the regulations does not, by itself, establish the need to reopen the record. If the safety concerns have been resolved by other means, a hearing may still be avoided.

This is the manifest purpose to which PG&E would put the constricted construction review performed by the IDVP. The evidence demonstrates that the IDVP review is incapable of so functioning.

A. The IDVP Review Provides No Answer to Whether PG&E's CQA Program Complied With the Requirements of Appendix B and GDC-1 of Appendix A

Though one IDVP witness stated that he believed that PG&E's CQA program complied with the "intent" of the

requirements of Appendix B (CQ Tr., p. 715), and that the IDVP program attribute checklist utilized Appendix B as a bench mark (CQ Tr., p. 708), the IDVP was forced to admit that its final report reached no conclusion about PG&E's compliance with the requirements of Appendix B. (CQ Tr., p. 744.) Indeed, the IDVP confirmed that it merely checked the QA programs of the two contractors examined against their own requirements, not whether the programs themselves met the requirements of Appendix B. (CQ Tr., p. 710.) Continuing in this vein, IDVP Project Manager William Cooper insisted that the IDVP's attribute checklist had nothing whatsoever to do with Appendix B but rather with whether the program met its own standards. (CQ Tr., p. 712.) Neither did Cooper deny that the IDVP attribute checklist for CQA failed to cover 11 aspects of Appendix B compliance. (CQ Tr., p. 750).

In short, the IDVP review did not provide this board with any answer to whether PG&E and its major subcontractors adopted a CQA program in full compliance with the requirements of Appendix B.

Similarly, the IDVP provided this board with no conclusion whatsoever regarding PG&E's compliance with the requirements of GDC-1 Appendix A.

B. The IDVP CQA Review Can Provide No Assurance That Safety-Significant QA Breakdowns and Safety-Significant Construction Errors Do Not Lie Undetected in the Work of the Two Contractors Examined

In testimony at the hearing the IDVP expressed the opinion that its goal was to assure that no safety-significant construction errors existed in the work of the two contractors

it was examining. The IDVP witnesses stated that their checklist of attributes examined in the work of the two contractors had been devised for this very purpose. As a result, the witnesses testified that they did not believe any safety-significant construction errors existed in the work of the contractors examined.

On cross examination, however, it was demonstrated that the IDVP could not guarantee that no construction errors of safety significance remained undetected in the work of the contractors examined. Nor could the IDVP provide assurance that there were no safety-significant QA breakdowns in PG&E's own QA program which could have led to a safety-significant construction error in the work of the unexamined contractors.

The cross examination of the IDVP established that, despite its avowed extensive search for the existence of construction errors of safety significance, it conducted virtually nothing more than a visual examination of the work undertaken and a paper review of radiographs and other tests performed by the contractors. In this regard, the IDVP specifically failed to re-do any of these specific tests to determine whether the results claimed to have been achieved were accurate. (CQ Tr., pp. 740 (B), 740 (C).) As a result, the IDVP and this board have no means of knowing whether these tests were performed correctly. Indeed, it is just these kinds of defects, hidden from the naked eye, which could prove to have the greatest safety significance, inasmuch as it is the full penetration pressure boundary welds which require more

than visual inspection to confirm their adequacy.

Under cross examination, the IDVP also conceded that it wholly failed to consider why the QA programs of the contractors at issue and PG&E failed to catch the non-conformances which the IDVP had uncovered. (CQ Tr., p. 762.) Indeed, IDVP witness Lundin admitted that he had no idea why these non-conformances had occurred. (CQ Tr., p. 762.) Consequently the IDVP review of construction QA totally ignored the QA significance of the non-conformances it was finding and can provide the board with no assurance that the QA breakdowns which allowed these "non-safety-significant" construction errors to go undetected did not result in a construction error of safety significance elsewhere in the plant.

By assessing the safety-significance of the discovered errors after the fact, the IDVP may be making valid findings about the specific errors detected, but it can make no finding about the safety significance of errors not detected. There is no evidence in the record to suggest the workers who made the errors and the inspectors who failed to detect them were in any position to assess the safety-significance of the deviations from design. Neither PG&E nor the IDVP can hide behind vague allusions to the "judgment" of QA personnel about the significance of deviations. While a learned panel of engineers may review the errors detected after the fact, their learning was utterly unavailable to the field personnel responsible.

C. The IDVP Can Offer No Assurance That the Work of Contractors It Did Not Examine Are Free of Safety-Significant Errors

Although it was conceded by the NRC staff that no statistically valid conclusion about the quality of the work of the contractors not examined could be drawn from the IDVP's results (CQ Tr., pp. 862-863), the IDVP attempted to extrapolate its findings on the Wismer and Becker and G.F. Atkinson work in Unit 1 to the work of all twelve contractors in both units. The IDVP witnesses volunteered the opinion that they were "reasonably confident" about the quality of the work of the 10 contractors not examined. (CQ Tr., p. 724.)

On cross examination it was demonstrated that the IDVP's "reasonable confidence" was based on assumptions having no valid foundation.

The IDVP's opinion was based on two assumptions. First, they assumed that if no significant safety errors were uncovered in the QA program of a PG&E subcontractor then it must be concluded that PG&E effectively oversaw the programs of all twelve contractors. (CQ Tr., p. 701.) The second assumption was that PG&E's performance in reviewing and auditing the work of all of its subcontractors was uniform. (CQ Tr., p. 703.)

The first assumption is propelled by no logical force. The fact that no significant errors are detected in a given subcontractor's QA program does not compel the conclusion that PG&E's QA program was effective. This is evident from the fact that the subcontractors developed and implemented their

own programs, not PG&E. Its role was only to review and audit their work. Thus, if a subcontractor did an excellent job, PG&E's review would of necessity have no effect.

The record in this proceeding has demonstrated that PG&E's second assumption is equally unfounded. If the IDVP's conclusions about the Wismer and Becker and Guy F. Atkinson work is to be believed, then PG&E's QA performance has been demonstrated not to have been uniform across all 12 of its subcontractors. In this regard, if the IDVP is right and PG&E's program was responsible for the fact that no safety-significant errors were found to exist in the two contractor programs examined by the IDVP, then PG&E is just as responsible for the safety-significant errors uncovered after PG&E's review of the Foley and Pullman-Kellogg work.

The record demonstrates that neither PG&E nor its subcontractors performed uniformly with respect to the discovery of safety-significant errors, and therefore the premises upon which the IDVP based its conclusion about the work of the unexamined contractors are utterly without foundation.

D. The IDVP's Review of CQA Can Provide No Assurance With Respect to the Quality of the Work Performed on Unit 2 by Any of PG&E's Subcontractors

It was undisputed that the IDVP not only performed no review of the quality of the work performed on Unit 2 (CQ Tr., p. 738) but that its Unit 1 work provided no statistical basis for estimating the number of errors in the work on Unit 2 of any contractors at the site. (CQ Tr., pp. 862-863.)

In its limited review of the Wismer and Becker work on Unit 1, 24 errors and open items were detected, one of which was grouped Class A. The crucial question for this board -- and for the public -- is how likely it is undisclosed safety-significant errors remain undetected. The IDVP's work to date has been useless to answer that question, as demonstrated by the fact that both the IDVP and the staff witnesses declined to offer any estimate of the number or probability of such errors. (CQ Tr., pp. 862-63.)

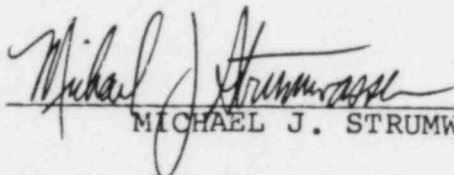
V.

CONCLUSION

The Governor has more than satisfied the applicable standard for a motion to reopen, demonstrating lack of compliance with the commission's regulations for quality assurance, PG&E's failure to implement the program it did have -- leading to a demonstrably defective design and a seemingly endless cascade of construction problems. While the existence of safety-significant regulatory deficiency is irrefutable, only in a full hearing can the extent of the deficiencies be determined and the required remedy be ascertained.

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING APPEAL BOARD

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In the Matter of)

PACIFIC GAS AND ELECTRIC COMPANY)

(Diablo Canyon Nuclear Power)
Plant, Units 1 and 2))

Docket Nos. 50-275 O.L.
50-323 O.L.

CERTIFICATE OF SERVICE

I hereby certify that on August 5, 1983, at approximately 2:00 a.m., P.D.T., I caused copies of the foregoing "Post-Hearing Brief of Governor Deukmejian in Support of His Motion to Reopen the Record on Construction Quality Assurance" served on the following by U.S. Mail, first class, postage prepaid.

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