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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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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.

JOINT INTERVENORS'  
MOTION TO AUGMENT OR, IN  
THE ALTERNATIVE, TO REOPEN  
THE RECORD

By letter to this Appeal Board dated December 9, 1983, the Joint Intervenor requested that an affidavit by former Diablo Canyon Project ("DCP") engineer Charles Stokes be issued as a Board Notification for review and possible comment by all parties. Pursuant to order of this Board, Pacific Gas and Electric Company ("PGandE") and the NRC Staff responded to that request, stating in essence (1) that the requested Board Notification was issued on December 27, 1983, and (2) that the appropriate procedure for comment upon any matters raised by the affidavit or any ongoing investigations is a motion to reopen the record.

Having reviewed the Stokes affidavit, the NRC Staff's preliminary assessment of some of those allegations provided at

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a meeting with PGandE on January 31, 1984, a February 1984 supplemental affidavit by Mr. Stokes, and a January 1984 affidavit by former Diablo Canyon engineer John Cooper, the Joint Intervenors hereby request that the record be augmented or, in the alternative, reopened on the issue of design quality assurance in order to take evidence regarding all matters relevant to the subject of the attached affidavits and other documentation, including the testimony of Mr. Stokes, Mr. Cooper and others with knowledge of those matters. The Joint Intervenors further request that thereafter a schedule be established for all parties to supplement their Proposed Findings of Fact and Conclusions of Law in light of this new information.<sup>1/</sup>

As appears below, the information contained in the attached documents bears directly on the issue of design quality assurance at Diablo Canyon and, in particular, upon contentions 1, 2, 5, 7, and 8 in the reopened design hearings held before

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<sup>1/</sup> At the conclusion of the reopened design hearings before this Board in November 1983, this Board explicitly declined to "formally close the record," choosing instead to "await events to see if there are any matters outstanding." Hearing Tr. D-3246 (November 21, 1983). Presumably, the Board did so in order to retain the option of permitting the parties to pursue -- and itself to consider -- new information developed as a result of design-related allegations then under investigation or later received by the NRC Staff. The information upon which this motion is based is precisely of that sort, and hence the relief requested herein is plainly within the Board's authority. In addition, however, as appears below, the standards for reopening the record are satisfied, and, accordingly, the Joint Intervenors believe that the requisite authority exists on that basis as well.

this Board in November 1983.<sup>2/</sup> Thus, augmentation of the record is plainly warranted by the significance and undeniable relevance of the information. In addition, however, the standards for reopening of the record are satisfied here: this motion concerns significant new information relevant to safety; the new information, if considered originally, would have changed the result; and the motion is timely. Kansas Gas and Electric Co. (Wolf Creek Generating Station), ALAB-462, 7 NRC 320, 328 (1978). Accordingly, this motion should be granted.

I. THE NEW INFORMATION IS SIGNIFICANT

The new information out of which this motion arises is unquestionably significant and relevant to the subject matter of the reopened design quality assurance proceeding. As appears below, the information goes to the very heart of the seismic redesign of the plant and the verification program undertaken by the DCP and the IDVP. The Stokes allegations and the NRC's assessment of those and other design-related allegations undermine both the validity and the integrity of the verification effort. Further, they belie PGandE's contention that it has remedied the deficiencies in its quality assurance program that gave rise to this reopened proceeding. In fact, the disregard for quality assurance that characterized the pre-1981 period has apparently continued unabated during the past

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<sup>2/</sup> See also the February 7, 1984 letter from the NRC Staff to the Board, in which the Staff indicated that, for example, the allegations regarding small bore piping design activities could bear on contentions 2 and 8.

three years. As a result, there continues to be inadequate assurance that Diablo Canyon has been properly designed consistent with licensing criteria.

A. 11/83 Affidavit of Charles Stokes (12/27/83 Board Notification)

In his initial affidavit (attached hereto as Exhibit A), Mr. Stokes describes a breakdown in the seismic redesign of Diablo Canyon initiated after the low power license was suspended in November 1981. Among other things, Mr. Stokes has alleged that the program was compromised by inadequate procedures, lack of document control, inadequate training of engineers, inadequate corrective action, use of questionable engineering practices to approve failed pipe supports, destruction of calculations showing failure of equipment, undocumented modifications in order to "pass" previously failing pipe supports, design drawings that fail to reflect the as-built condition of the plant, poorly controlled field modifications, and retaliation against engineers who questioned the poor design practices.<sup>3/</sup> More specifically, Mr. Stokes has alleged the following:

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<sup>3/</sup> Many of Mr. Stokes' allegations confirm the types of design discrepancies described by Richard Hubbard in his testimony in the reopened design proceeding, particularly as it related to evidence of the failure of the verification program to assure that the as-built plant -- including piping and pipe supports -- conforms to design documents, its failure to identify root causes, and the continuing inadequacies in the DCP quality assurance program for its corrective action program. See e.g., Hubbard Testimony, at IV, VI, VII, and Tables 5-1 and 8-1.

(1) construction of new pipe supports near previously failing supports, in order to redo the calculations and "pass" the failed pipe supports, thereby avoiding the requirement to expand the sample due to an initially high failure rate (Affidavit, at 12);

(2) design drawings that exaggerated the load ratings, or strength, of hardware such as U-bolts by up to four times more than claimed by those who sold the bolts. The ratings were possible due to inaccurate assumptions about pipe size and room temperature conditions, as well as failure to mention that the bolts were forcibly bent in order to achieve the load ratings. Engineers were instructed to continue relying on the false load ratings, even after the inaccuracies had been exposed (id. at 5-7);

(3) management action to identify the engineers who had failed pipe supports and transfer them from the assignments. They were replaced by engineers who would not challenge the company line (id. at 9);

(4) failure to issue controlled documents for engineers to use in sample

calculations. The engineers compensated by basing their analyses for Diablo Canyon on calculations drawn from the unique conditions of different plants, such as Davis Bessie, Midland, Catawba and others. As a result, the factual assumptions were inaccurate in up to 30% of the cases (id. at 10);

(5) destruction of engineering calculations that failed pipe supports, along with references in the calculations log to the engineering reviews that produced this "wrong" result. In Mr. Stokes' case, the log only reflects his work for five out of more than 100 calculations which he prepared. "[T]he original calculations demonstrating system failures vanished" (id. at 10);

(6) complete reanalysis of the failed pipe supports described above by new engineers, although their official mission was merely to conduct routine reviews for the accuracy of previously completed work (id. at 9-11);

(7) a stated policy that once an engineer signed off on calculations, "they were Bechtel property and Bechtel could do



what they pleased, including destroying them and having someone else rewrite them" (id. at 10);

(8) redefinition of hardware, such as renaming an unintentional restraint as a support, thereby inaccurately reclassifying a design flaw as an additional factor of safety (id. at 13);

(9) design flaws that led, inter alia, to welds with radii up to 25% smaller than minimum American Welding Society ("AWS") standards, and failure to provide full penetration of welds, as required by AWS. The design drawings inaccurately represented the nature of the welds in the plan, so quality control inspectors did not look for the flaws that in fact existed (id. at 16-17, Exhibit 1);

(10) failure to modify pipe weld procedures to reflect their use on support steel, resulting in both suspect hardware and unreliable quality control inspections that checked for compliance with the wrong procedures (id. at 17, Exhibit 1);

(11) angle members, another form of pipe support, that were up to four times too long for allowable bending stress

under the relevant professional code. In an hour walkdown, Mr. Stokes found over 200 violations, on approximately 100 out of 300 frames checked. Some unreliable supports have been repaired, while equivalent pieces remain untouched (id. at 17-18, Exhibit 2);

(12) failure to verify the proper location of hilti-bolts due to engineering analyses and QC inspections based on measurements from the wrong base lines (id. at 18, Exhibit 3);

(13) failure for sustained periods even to issue blank Discrepancy Report ("DR") forms -- the engineering equivalent of Nonconformance Reports -- necessary to report major problems such as those identified by Mr. Stokes (id. at 19-20);

(14) retaliation against those who wrote Discrepancy Reports. In October Mr. Stokes took the initiative to obtain blank forms and submit the DR's. The DR's disclosed his unsuccessful efforts to raise these issues within the chain of command up to Bechtel headquarters in San Francisco. Within two weeks he was laid off. Although the official excuse was



reduced manpower needs, for the next few weeks the staff was working overtime. On November 14, Mr. Stokes filed a complaint with the Department of Labor pursuant to 42 U.S.C. § 5851, challenging his layoff as retaliatory. On January 9, 1984, the Labor Department found in favor of Mr. Stokes. See Labor Department decision letter (attached hereto as Exhibit B).

B. 2/84 Affidavit of Charles Stokes

On February 8, 1984, Mr. Stokes executed a second affidavit that supplements and updates his initial allegations. In that affidavit (attached hereto as Exhibit C), he provides further evidence of poor design practices, affirmative action by PGandE to bypass formal quality assurance procedures, and even an unwritten PGandE policy that engineers were not to discuss problems with the NRC or Quality Control. Of particular note is his description of PGandE's critical "Quick Fix" program for making engineering corrective actions in the field. According to Mr. Stokes, this program was essentially "an uncontrolled, underground engineering program" that substituted for formal quality assurance procedures and was subject to numerous abuses. Stated in general terms, Mr. Stokes alleges the following:

- (1) an unwritten policy that problems not be discussed with the NRC or Quality Control, leading to

"paranoia" among the workers about such discussions with the NRC (2/84 Affidavit, at 1-2);

(2) enforcement by management of questionable design practices by hiring aliens or "green cards" who were afraid to disagree with superiors due to risk of firing or deportation (id. at 2);

(3) creation of and reliance upon a "Quick Fix" design change program that circumvented formal quality assurance procedures and functioned "essentially as an uncontrolled underground engineering program." Engineers were not informed of the proper procedures, yet they "completely redid the design of hangers, deleted hangers, deleted weld symbols from the drawings, and took similar actions without the benefit of any calculations." The normal quality assurance reporting system for nonconformances was bypassed, even with respect to significant hardware deficiencies recorded only on Quick Fix sheets (id. at 2-4);

(4) failure to include the assumptions in the final calculations in the seismic design review, thereby precluding effective tracking (id. at 4-5);

(5) deficient design drawings for welding resulted in the various PGandE or DCP departments working to drastically different assumptions -- sometimes differing by as much as 100% -- about the penetration of certain welds. The weaknesses in these

drawings were not compensated for by the weld procedures or techniques (id. at 6);

(6) deficient welding procedures, including the main relevant Pullman welding procedure -- ESD 223. That procedure was not applied correctly, contained inaccurate information, and was not generally available to all welders. The potential mistakes resulting from deficient welding procedures and practices were not caught and reviewed by engineering (id. at 8-9);

(7) inadequate corrective action with respect to inspection procedures and weld deficiencies (id. at 9-10).

These allegations, together with those contained in Mr. Stokes' initial affidavit, describe a redesign program riddled with deficiencies, stemming from a continuing failure by PGandE management and supervisory personnel to appreciate the importance of and to implement an adequate quality assurance program for the design of Diablo Canyon. The inevitable result is that serious questions remain regarding the facility's design.

C. Board Notification 84-022 (2/7/84)

On February 7, 1984, the NRC Staff served on the Commission and the responsible licensing and appeal boards for in camera consideration a transcript of a January 25, 1984 meeting between the Staff and Charles Stokes. In order to

protect the identities of certain individuals named in the transcript, the document was not served on the parties to this proceeding.

According to the cover memorandum (attached hereto as Exhibit D) served on all parties, however, the meeting related to Mr. Stokes' allegations concerning small bore piping at Diablo Canyon. Hence, the meeting is relevant to the subject of this motion, and the Joint Intervenors hereby incorporate that transcript by reference in support thereof.

D. NRC Assessment

This motion is based also on recent evidence that the Stokes allegations have substantial basis. After several weeks of investigation (including several meetings with Mr. Stokes), the NRC Staff has now raised a number of questions about the adequacy of Diablo Canyon's design and of the IDVP's verification effort. At a meeting with PGandE on January 31, 1984 regarding small bore piping and piping supports at Diablo Canyon (NRC Staff handout sheets attached hereto as Exhibit E), the Staff described a series of technical and nontechnical issues, significant in scope and implications, that it had been unable to resolve in its own review. Those issues were based, among other things, on evidence of altered current documentation, destroyed documentation, calculation errors and modeling deficiencies, simplification of "failed" calculations in order to make them "pass," and a list of the following "proposed [quality assurance] violation items":

Item No.	Item Description	Against 10 CFR 50 Appendix B, Criterion
1.	The site small bore design group personnel authority and duties were not established and delineated in writing.	I
2.	There has been inadequate program provisions for personnel indoctrination and training. The S/B pipe support engineers were not familiar with important elements in both licensee QA and technical programs.	II
3.	S/B QA program deficiencies and design nonconformances had not been identified and corrected promptly.	XVI
4.	Defective document control system observed at S/B design groups:	VI
	a. Design procedures out-of-date.	
	b. Use of Inter-office memorandum in lieu of work procedures.	
	c. Procedure listings out-of-date.	
5.	Inadequate Design Procedures:	V
	a. Design change request	
	b. piping movements within rigid restraint gaps	
	c. Use of out-side reference and data.	



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| 6. | Fail to follow procedures:   | V     |
|    | a. S/E support calculation input checking  |       |
|    | b. personnel training  |       |
| 7. | Inadequate Design Control:   | III   |
|    | a. Design criteria conflict in controlling pipe restraint structural frequencies.  |       |
|    | b. Extensive errors that been identified in both preliminary and final support calculations.   |       |
|    | c. Lack of program provision to verify telephone provided preliminary design information.  |       |
|    | d. Lack of design consideration of synchronizing loading between closely spaced rigid/rigid restraints, and rigid restraint/anchor.  |       |
|    | e. Snubbers were made inoperable by placing them in close proximity with rigid restraints and anchors.   |       |
|    | f. Lack of design ALARA consideration for snubbers.  |       |
| 8. | Inadequate licensee technical QA audits and surveillances to identify and correct the many design control and program deficiencies revealed during this inspection/investigation. (Exhibit E.) | XVIII |

In addition, the Staff reviewed a limited sample of small bore piping support calculations and found a disturbingly high rate of error. Of the 12 calculation packages reviewed, 9 contained errors:



SMALL BORE SUPPORT CALC. PACKAGES  
(as of December 8, 1983)

NO.	CALC.	SUPPORT	COMMENT
1	MP 072	2171-16	Design Deficiency, QA Deficiency.
2	MP 345	2182-74	OK
3	MP 357	2182-91	OK
4	MP 951	100-111	Deficiency (Review Not Complete).
5	MP 955	99-201	Calc. Deficiency. QA Deficiency.
6	MP 983	99-11	Design Deficiency.
7	MP 988	100-132	Modeling Deficiency. Cal. Errors. QA Deficiency.
8	MP 397	H21-226	OK
9	MP 456	002-170	QA Deficiency.
10	MP 942	99-20	Calc. Deficiency. Calc. Error.
11	MP 1621	2156-200	Calc. Error. Design Deficiency.
12	MP 1691	97-90	QA Deficiency.

With regard to large bore pipe snubbers, the Staff found that 89% of those reviewed (8 of 9) "will not function per design during seismic event." Id.

Based in part upon this high rate of error, the Staff raised the following questions about the adequacy of the IDVP's review of pipe supports, as described in ITR 60, "IDVP Review of Corrective Action, Large and Small Bore Pipe Supports":

- a. Why were L/E snubber/rigid restraint; rigid/rigid restraint/ rigid restr./rigid restr. interaction; and snubber ALARA problems not reviewed?
- b. In conjunction with the large amount of computational errors identified by NRC during the S/B support review, and the ITR's own finding of similar problems, why was Cloud S/B review concluded that IDVP was acceptable without additional sampling review?
- c. How can Cloud conclude that the "corrective action" was acceptable based on such small sample size review, and with large amount of errors being identified.

Id.

The answers to these questions are critical to resolution of the issues before the Board in the reopened design proceeding. Indeed, the adequacy of the IDVP was the central focus of that proceeding. Nevertheless, the Staff's factual findings upon which those questions are based are directly inconsistent with the fundamental assurance of compliance with licensing criteria found by the IDVP. Because this new evidence undermines the IDVP's assurance, it undermines as well the confidence necessary to support PGandE's claim that the deficiencies caused by the lack of an adequate quality assurance program in the design of Diablo Canyon have been identified and corrected. Thus, the new information is unquestionably significant.

E. 1/84 Affidavit of John Cooper

On January 3, 1984, former Diablo Canyon engineer John Cooper executed an affidavit (attached hereto as Exhibit F) describing his three-year effort to persuade PG&E to correct a design deficiency in the Residual Heat Removal ("RHR") system. That deficiency, which has still not been corrected by PG&E, has twice led during that three-year period to the spurious closure of the RHR hot leg suction valves, causing serious damage to an RHR pump in October 1983. Consistent with the experience of Charles Stokes, Mr. Cooper's efforts were met not by prompt attempts to resolve a safety problem, but by PG&E intimidation, retaliation, and inaction:

To my dismay, I found that my new supervisor made repeated attempts to downplay my concerns and discourage me from documenting these problems, as I have described in the chronology of events. I was reprimanded for notifying [PG&E] Coast Valleys Division of a problem with the RHR system and one of their Emergency Operating Procedures, and threatened with "losing my job" if I talked to the NRC about it. The forms I filed documenting errors in the FSAR were voided with no reason given, and the Design Change Requests I filed were simply ignored. Eventually I was sent on "Special Assignment" to the Sierra Nevada mountains, and quit PG&E soon thereafter.

In summary, my experience with the PG&E management at Diablo Canyon after 1977 was consistently one of intimidation, retaliation, records destruction, and inadequate corrective action to deliberately circumvent problems instead of directly addressing them.

(Affidavit, at 26.)

Although the affidavit relates in substantial part to the specific design problem in the RHR system, Mr. Cooper portrays also a seriously flawed design process analogous to that described by Mr. Stokes. Among the quality assurance deficiencies recounted by Mr. Cooper were failure of corrective action (id. at 13, 24), deficient approved design drawings (id. at 13, 21), denial of access to necessary design information (e.g., revised plant drawings and NRC I&E Bulletins) (id. at 25), destruction of documents (id. at 24), retaliation against technicians who "found too many problems" (id. at 25-26), intimidation and threats by PGandE management for disclosure of problems to persons outside the company (id. at 9), violation of internal administrative controls in the disposition of a Nuclear Plant Problem Report ("NPPR") (id. at 11-13), and PGandE refusal to correct an erroneous FSAR description of the RHR, in violation of NRC regulations.

These and other allegations by Mr. Cooper are consistent with the picture of deficient design practices outlined by Mr. Stokes. As such, they undermine confidence not only in the design of the RHR system, but other aspects of the Diablo Canyon facility that are a product of the same design process.

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## II. THE NEW INFORMATION REQUIRES DENIAL OF A LICENSE

The information outlined herein and in the attached documentation establishes widespread violations of the Commission's regulations, including a number of the 10 C.F.R. Part 50, Appendix B criteria. Further, it undermines the essential assurance that Diablo Canyon has been properly designed consistent with licensing criteria. Under these circumstances, no license may lawfully be issued. 10 C.F.R. § 50.57(a). Therefore, such new information, had it been available originally, would necessarily have changed the result, and PGandE's application for a license would have been denied.

The new information upon which this motion is based -- like that offered in support of the Joint Intervenors' June 8, 1982 motion and at the November 1983 hearing -- indicates that PGandE and its Diablo Canyon Project continue to cut corners on quality in an attempt to license Diablo Canyon in the shortest possible time. As a result, the Commission's design standards are ignored, proper practices and procedures become secondary, and the safety of the facility is jeopardized.

Further, this evidence confirms the contentions of the Joint Intervenors and the Governor that the verification program instituted by the DCP and the IDVP ordered by the Commission have failed to verify the correctness of the Diablo Canyon design or to provide a level of assurance equivalent to the confidence that would have been achieved had PGandE initially established and implemented a quality assurance program that complied with the Commission's regulations. Thus, PGandE has



failed to carry its burden of proof as the applicable standard was established by this Board in its August 16, 1983 Order.<sup>4/</sup>

Accordingly, the record must be augmented or, in the alternative, reopened to permit all parties to address this information through on the record evidence and, in particular, to require PGandE to respond to this significant new information through on the record evidence. Absent a sufficient showing, PGandE is not entitled to an operating license at Diablo Canyon and its suspended low power operating license must be revoked.

### III. THIS MOTION IS TIMELY

All of the information upon which this motion is based has come to light during the past several months. The Stokes

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<sup>4/</sup> In its August 16, 1984 Order, this Board defined PGandE's burden of proof as follows:

The real issue in the reopened proceeding has, in effect, moved beyond the question of what deficiencies existed in the applicant's Diablo Canyon design quality assurance program to the question whether the applicant can demonstrate that the IDVP and the ITP verify the correctness of the Diablo Canyon design. As previously stated, this is necessary because the apparent weakness of the applicant's design quality assurance program has rendered the design of the plant's structures, systems and components suspect. The applicant's use of the IDVP and ITP therefore may be loosely analogized to an affirmative defense to the apparent failure of the Diablo Canyon design quality assurance program to comply with the Commission's regulations. As such, the applicant has both the burden of going forward and the burden of proving the adequacy of the IDVP and ITP to establish that the plant is properly designed. . . .

Id. at 6 (footnote omitted).



11/83 affidavit was not circulated to all parties for review until December 27, 1983; his supplemental affidavit was prepared in February 1984; the NRC assessment of his initial allegations was not made public until January 31, 1984; the Cooper affidavit was prepared in January 1984; and the Stokes-NRC meeting was held on January 25, 1984 and announced by Board Notification on February 7, 1984. Thus, this motion is unquestionably timely.

#### IV. CONCLUSION

For the reasons stated herein, the Joint Intervenors request that this motion be granted.

Dated: February 14, 1984

Respectfully submitted,

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
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PACIFIC GAS AND ELECTRIC COMPANY	)	Docket Nos. 50-275 O.L.
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(Diablo Canyon Nuclear Power	)	
Plant, Units 1 and 2)	)	
	)	
	)	

CERTIFICATE OF SERVICE

I hereby certify that on this 14th day of February, 1984, I have served copies of the foregoing JOINT INTERVENORS' MOTION TO AUGMENT OR, IN THE ALTERNATIVE, TO REOPEN THE RECORD, mailing them through the U.S. mails, first class, postage prepaid.

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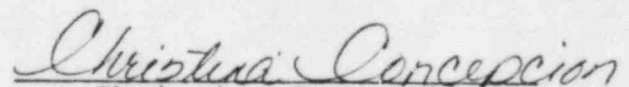
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