

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
BEFORE THE COMMISSION

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USNRC

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OFFICE OF SECRETARY  
DOCKETING & SERVICE  
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In the Matter of )  
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PACIFIC GAS AND ELECTRIC COMPANY )  
 )  
(Diablo Canyon Nuclear Power )  
Plant, Units 1 and 2) )  
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Docket Nos. 50-275 O.L.  
50-323 O.L.

JOINT INTERVENORS'  
PETITION FOR REVIEW  
OF ALAB-756

Pursuant to 10 C.F.R. § 2.786, the SAN LUIS OBISPO MOTHERS FOR PEACE SCENIC SHORELINE PRESERVATION CONFERENCE, INC., ECOLOGY ACTION CLUB, SANDRA SILVER, GORDON SILVER, ELIZABETH APFELBERG, and JOHN FORSTER ("Joint Intervenor's") hereby petition the Commission to review ALAB-756, issued by the Atomic Safety and Licensing Appeal Board ("Appeal Board") in the above-entitled proceeding on December 19, 1983.<sup>1/</sup> In that decision (attached as an exhibit hereto), the Appeal Board provided an "explanation" for its October 24, 1983 summary denial of the Joint Intervenor's and Governor Deukmejian's ("movants") motions to reopen the record on the issue of construction quality assurance ("CQA"), filed on May 10, 1983 and May 17, 1983, respectively.<sup>2/</sup> Briefly stated, the Board concluded that movants had "failed to provide new evidence of a significant safety issue." ALAB-756, at 28.

<sup>1/</sup> The decision was served on December 20, 1983 by first class mail.

<sup>2/</sup> On October 31, 1983, the Joint Intervenor's petitioned the Commission for review of the Appeal Board's October 24th Order. In its November 8, 1983 licensing decision, the Commission deferred a decision on that petition pending an explanation by the Appeal Board of its reasons for denial of the construction quality assurance motions.

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In order to remedy the manifest error of the Appeal Board -- as outlined below -- the Joint Intervenor request the Commission to (1) grant review of ALAB-756 and (2) reverse the Appeal Board's denial of the subject motions to reopen the record.<sup>3/</sup>

I. COMMISSION REVIEW SHOULD BE EXERCISED

If fairness and principled decision-making have a continuing place in this licensing proceeding, then Commission review of ALAB-756 is essential. Initially denying movants' CQA applications in a summary order without any explanation of reasons, the Appeal Board has now offered a supporting opinion that misstates the standard of review established in Vermont Yankee, ignores virtually in total the evidence offered by movants in support of reopening of the record, and adopts wholesale the now familiar refrain of assurances by PGandE and the Staff that any deficiencies are isolated and insignificant.

The Board's total failure even to address the extensive testimony of Richard B. Hubbard, the quality assurance expert relied upon by the Governor and the Joint Intervenor, is shocking, but illustrative.<sup>4/</sup> As the Commission is aware, Mr. Hubbard is a recognized expert in quality assurance for nuclear power generation facilities. During the past nineteen years, he has designed quality assurance programs, trained auditors, supervised inspectors, written quality assurance standards, and consulted on the issue for numerous governmental entities. During the past eight years, he has been closely involved in this proceeding as a technical

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<sup>3/</sup> All matters of fact and law discussed herein were previously raised. For a listing of the principal filings, see the Joint Intervenor's October 31, 1983 Petition for Review of the Appeal Board's October 24, 1983 Order, at 2-3.

<sup>4/</sup> The motions were based substantially upon the testimony of Richard B. Hubbard, who prepared literally hundreds of pages of affidavits, together with supporting documentation, and who testified for one day of the four day "mini-hearing" on the motions in July 1983.

expert, and prior to 1976, he served in engineering and management positions in the nuclear division of the General Electric Company.

Incredibly, despite Mr. Hubbard's lifetime of experience in quality assurance, the Appeal Board found him only "marginally qualified" to offer testimony on the issue. CQA Tr. 74. Still worse, however, in ALAB-756, the Board in effect dismissed as worthless all of Mr. Hubbard's testimony, concluding in a footnote that "Mr. Hubbard's opinion is entitled to little weight and it does nothing to enhance the movant's arguments." ALAB-756, at 10 n.10. Throughout the remainder of its decision, the Board made no further reference to Mr. Hubbard or his testimony.

Such a flagrant failure to credit and address competent testimony by a qualified expert is an abuse of the Board's authority and a disservice to the Commission and the public. In order to protect the integrity of the licensing process and the health and safety of the public, Commission review of ALAB-756 must be granted.

## II. THE APPEAL BOARD'S DECISION IS ERRONEOUS

A. Standard of Review -- The Appeal Board misapplied the well-established NRC standard for review of a motion to reopen the record. In Vermont Yankee Nuclear Power Corporation (Vermont Yankee Nuclear Power Station), ALAB-138, 6 AEC 520, 523-525 (1973), the Appeal Board set forth the precise test to be applied to a timely motion to reopen raising a significant safety issue:

The 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. (Footnotes omitted.) (Emphasis added.)

In this case, however, the Appeal Board resolved numerous disputed issues of fact against the Joint Intervenors and the Governor, on the basis in part of a "mini-hearing" held without benefit of any discovery and under highly restrictive time constraints on examination at the hearing.<sup>5/</sup> Indeed, in ALAB-756, the Board explicitly rejected the notion that a summary disposition standard is appropriate, stating that "[t]he analogy in Vermont Yankee to summary disposition . . . should not be interpreted to mean that such evidence is all that is ever necessary to meet the test for reopening." ALAB-756, at 8 n.8.

Neither the Joint Intervenors nor the Governor suggested that the Vermont Yankee standard cited above should be applied without regard to the three part test for reopening the record. Kansas Gas and Electric Co. (Wolf Creek Generating Station, Unit 1), ALAB-462, 7 NRC 320 (1978). The Board erred, however, in applying that reopening test only after it had resolved disputed issues of material fact against the movants. Such a procedure violates the Vermont Yankee standard, and the Board's decision in ALAB-756 must, therefore, be reversed.

B. NSC Audit Report -- The Board also erred in dismissing virtually without analysis -- again in a footnote -- the critical findings in a recently

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<sup>5/</sup> For example, the Board rejected movants' expert testimony regarding the implications of established quality assurance errors in design for quality assurance errors in construction; similarly, it discounted their contention that the construction quality assurance errors disclosed by the Independent Design Verification Program ("IDVP") had any generic or individual significance, despite their great number and the superficiality of the IDVP's review. Further, the Board adopted the Staff and PGandE contentions that the allegations by a site contractor's former quality control manager were unsubstantiated, and it did the same with the Nuclear Services Corporation ("NSC") audit report establishing pervasive deficiencies in the quality assurance program of PGandE's principle piping contractor at Diablo Canyon. See discussion infra.



disclosed report by Nuclear Services Corporation ("NSC") of an audit of Pullman Power Products ("Pullman"), the principal piping contractor at Diablo Canyon. The report documents widespread deficiencies in Pullman's construction quality assurance program throughout the seven-year period when the plant was constructed, thus casting in doubt the adequacy not only of Pullman's program, but the actual construction of the plant.

Never denying the significance of the findings if true, the Board instead relied blindly on the assertions of PGandE and the Staff that only a few of the findings were accurate and that any related deficiencies were all subsequently reviewed and corrected. The Board adopted unquestioningly the obviously self-serving assurances offered by PGandE and the Staff, failing to inquire into or even to mention the NSC findings (1) that virtually no quality assurance program existed prior to 1974 and (2) that, from 1974 until the audit was conducted in 1977, the program established was riddled with deficiencies. The Board's myopic review is all the more remarkable given PGandE's apparent failure to reveal the report to the NRC, the responsible NRC licensing boards, or the public for over six years during which the issue of quality assurance was being contested.<sup>6/</sup>

The Appeal Board's refusal to acknowledge the significance of this new evidence is arbitrary, capricious, and an abuse of discretion. Its decision must, therefore, be reversed.

C. Movants' Expert Testimony -- As discussed briefly supra, the Appeal Board erred in ignoring the extensive and detailed testimony offered by Richard B. Hubbard in support of reopening. Relegating Mr. Hubbard's testimony to a single footnote, the Board characterized his affidavit, declaration, and testimony as

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<sup>6/</sup> Indeed, the report was made public only this year when it was released anonymously by a source other than PGandE.

"entitled to little weight" and concluded that his opinion does "nothing to enhance the movants' arguments." ALAB-756, at 10 n.10. With that single reference, the Board sought apparently to free itself of the obligation to address the substance of Mr. Hubbard's expert testimony.<sup>7/</sup>

Were Mr. Hubbard without experience or qualifications in the area of quality assurance or Diablo Canyon, the Board's blanket rejection of his testimony might be a permissible exercise of its discretion. As is evident from his attached resume, however, such is not the case. From 1965 through 1976, he served in responsible engineering and management positions in the Nuclear Instrumentation Department (1965-71), Atomic Power Equipment Department (1971-75), and Nuclear Energy Control and Instrumentation Department (1975-76) of the General Electric Company. During the past seven years, he has consulted on matters pertaining to the safety, quality, reliability, and economic aspects of nuclear power facilities for the federal government and numerous states and other jurisdictions, including the Swedish government. He has testified on safety-related aspects of nuclear facilities before NRC licensing boards, the ACRS, the Joint Committee on Atomic Energy of the United States Congress, and various federal and state legislative bodies. From 1971 through 1976, he served as manager of quality assurance for the manufacturing operations of GE's Nuclear Energy Division, where he was responsible for the development and implementation of quality plans, programs, methods, and equipment to ensure compliance with 10 C.F.R. Part 50, Appendix B. He is a member of the IEEE Nuclear Power Engineering Standards Subcommittee responsible for the preparation and revision

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<sup>7/</sup> See Affidavit of Richard B. Hubbard Concerning Breakdowns in the Diablo Canyon Quality Assurance Program (May 24, 1982; filed June 7, 1982); Supplemental Affidavit of Richard B. Hubbard Concerning Breakdowns in the Diablo Canyon Quality Assurance Program (March 26, 1983; filed March 29, 1983); Declaration of Richard B. Hubbard on Breakdowns in Construction Quality Assurance at Diablo Canyon (May 6, 1983; filed May 17, 1983); Affidavit of Richard B. Hubbard (June 15, 1983; filed June 17, 1983).

of a number of quality assurance standards for safety-related aspects of nuclear power facilities.

Finally, he has been closely involved in this proceeding for eight years, having attended numerous hearings, meetings, and briefings both as an observer and participant. He has appeared before this Commission as an expert witness on behalf of the Governor of California to offer opinions regarding quality assurance, and he submitted literally hundreds of pages of testimony and documentation in support of the motions to reopen denied by the Appeal Board in ALAB-756.

Unquestionably, Mr. Hubbard is eminently qualified to testify regarding quality assurance issues. Although PGandE sought to challenge his qualifications to testify regarding construction matters such as welding procedures and specific construction code requirements, Mr. Hubbard never sought to do so, considering such detailed familiarity unnecessary in a quality assurance review. Indeed, even the quality assurance expert offered by PGandE conceded that such a narrow expertise in construction matters is "irrelevant" to an ability to assess the adequacy of a quality assurance program. CQA Tr. 519.<sup>8/</sup>

A quick reading of Mr. Hubbard's affidavits, declaration, and testimony indicates clearly the significance of his testimony. For example, he testified regarding the implications of existing quality assurance deficiencies in design for construction, the significance of the CQA deficiencies outlined by the former quality control manager for Foley, the deficiencies in the IDVP CQA review, and the significance of the deficiencies disclosed by that review. The importance of such testimony and the Appeal Board's refusal to address it is obvious.

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<sup>8/</sup> The Board's apparent distinction between design and construction quality assurance finds no basis in the regulations. In fact, the standards of Appendix B know no such distinction.

Similarly, the Board's concern about Mr. Hubbard's familiarity with Diablo Canyon CQA procedures is puzzling given his lengthy participation in this proceeding. Notably, PGandE has persistently refused Mr. Hubbard any access to CQA-related documents, even where related to the limited IDVP CQA review. CQA Tr. 186-89.

In short, the Board flatly rejected critical testimony on significant safety issues without even addressing its substance. ALAB-756 must, therefore, be reversed. Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2), ALAB-422, 6 NRC 30 (1977).

D. IDVP Review -- As did PGandE and the NRC Staff, the Appeal Board relied heavily on the findings of the limited construction quality assurance review conducted by the IDVP in concluding that no basis for reopening exists. In so doing, it erred for several reasons. First, while conceding that the "review did result in the finding of a number of errors," ALAB-756, at 17, the Board failed to acknowledge the full extent of those errors. According to expert Hubbard, the IDVP discovered discrepancies in 20-40% of the items reviewed during the course of the audit. Affidavit, at 5-6 (June 1983). Such a high percentage of error is a strong indicator of a deficient quality assurance program.

Second, the Board rationalized the number of deficiencies by denigrating their individual significance. In fact, as the Board failed to note, the type of review conducted by the IDVP virtually ensured that the discrepancies found would be of a documentation and cosmetic variety, because the review consisted primarily of documentation review and visual inspection. CQA Tr. 879 (Morrill). Movants' repeated request that the IDVP review focus to a greater degree on actual "hardware" has fallen on deaf ears.<sup>9/</sup>

Third, the Board did not even address the majority of the movants' criticisms of the narrow scope of the IDVP review. The limited number of contractors reviewed, the failure to document any comparison to Appendix B, and the virtually total concentration on paper and visual inspection -- each of these concerns was all

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<sup>9/</sup> Both expert Hubbard and PGandE's expert Amaral agreed that, from a QA standpoint, one must be concerned about all errors, not simply those subsequently characterized as significant. CQA Tr. 426-27.



but ignored. Further, the Board inexplicably praised the IDVP for using the current, more stringent quality assurance standards to review past construction work. In fact, the reports issued and the testimony at the mini-hearing are unequivocal that the standards applied were those in effect at the time the construction work was done. See ITRs 34 and 36; CQA Tr. 502-09.<sup>10/</sup>

The Board improperly and arbitrarily ignored relevant evidence critical of the IDVP's conclusion that construction quality assurance at Diablo Canyon is adequate. ALAB-756 must, therefore, be reversed.

E. PGandE's Construction Contractors -- In addition to its inadequate treatment of the NSC Pullman audit (see discussion supra), the Board erred in denigrating the evidence of deficiencies in the QA/QC program of the Howard P. Foley Co., one of the two principal on-site construction contractors. First, the Board simply failed to mention numerous allegations by the former QC Manager at Foley, Virgil Tennyson, because, in the opinion of the Staff, they were not substantiated. Further, it ignored some five other substantiated allegations, focusing only on one incident involving a red tag violation. Thus, its conclusion that the red tag violation was isolated is not supported by the weight of the evidence.

Second, in excusing the evidence of between 8 and 14% deficiencies in welding in the Fuel Handling and Containment Buildings, the Appeal Board cited the rapid influx of new workers (increase from 2,000 to 7,000 workers in nine months), asserted that such deficiency levels are expected in large construction projects, and praised PGandE's prompt recognition of the problem and response. In fact, the high level of deficiencies could and should have been avoided by a proper quality assurance program had PGandE not decided to sacrifice quality for speed, and even the

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<sup>10/</sup> Movants challenged the conclusions of the IDVP based on its failure to utilize statistical sampling methods as a basis for extrapolation. Without any supporting basis, the Board simply denied the relevance of the issue. ALAB-756, at 18.

responsible NRC inspector stated regarding the welding deficiencies that PGandE had failed to "make th[e] judgment that there was a widespread serious problem in that area." CQA Tr. 826.

Third, despite these substantial welding deficiencies, the allegations of excessive production pressure on quality personnel at Foley, the issuance of recent Notices of Violation for welding and procedural violations, the numerous substantiated CQA deficiencies alleged by Foley's quality assurance manager, the fact that inspectors were working 60 to 70 or more hours per week, and the conceded inadequate training and certification of welders and inspectors at Foley during the recent modification program, the Board refused to acknowledge the existence of significant new evidence of a construction quality assurance breakdown at Foley. Its refusal in the face of this and other new evidence requires careful review by the Commission and reversal of ALAB-756.

F. Appendix A -- The Appeal Board concluded below that PGandE was not required to establish and implement a quality assurance program for structures, systems, and components important to safety but not safety grade. In so doing, it ignored the express terms of 10 C.F.R. Part 50, Appendix A, GDC 1, as well as the prior decisions of the Appeal Board in Metropolitan Edison Co. (Three Mile Island, Unit 1), ALAB-729, 17 NRC \_\_ (May 26, 1983), and of the Licensing Board in Long Island Lighting Company (Shoreham Nuclear Power Station, Unit 1), LBP-83-57 at 164, et seq., \_\_ NRC \_\_ (September 21, 1983). Because the Appeal Board's decision is inconsistent with the Commission's regulations and the decisions of its adjudicatory boards, ALAB-756 must be reversed.<sup>11/</sup>

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<sup>11/</sup> The Board's suggestion that movants failed to identify any SS&C's important to safety but not safety-grade is misleading at best. PGandE's FSAR, at Table 3.2-1, makes clear that such components exist. The Board's refusal to permit any discovery on the issue, however, renders virtually impossible the specific identification the Board apparently considers essential.

III. CONCLUSION

For the reasons stated herein, the Joint Intervenor request that this Petition for Review be granted and ALAB-756 be reversed.

Dated: January 9, 1984

Respectfully submitted,

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ATTACHMENT A

PROFESSIONAL QUALIFICATIONS OF RICHARD B. HUBBARD

RICHARD B. HUBBARD  
MHB Technical Associates  
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San Jose, California 95125

EXPERIENCE:

9/76 - PRESENT

Vice-President - MHB Technical Associates, San Jose, California.  
Founder, and Vice-President of technical consulting firm. Specialists in independent energy assessments for government agencies, particularly technical and economic evaluation of nuclear power facilities. Consultant in this capacity to California, Massachusetts, Oklahoma and Illinois Attorney Generals, Minnesota Pollution Control Agency, German Ministry for Research and Technology, Governor of California, Swedish Energy Commission, Swedish Nuclear Inspectorate, Suffolk County, Ohio Consumer's Counsel, New Jersey Public Advocate, and the U. S. Department of Energy. Also provided studies and testimony for various public interest groups including the Center for Law in the Public Interest, Los Angeles; Public Law Utility Group, Baton Rouge, Louisiana; Friends of the Earth (FOE), Italy; and the Union of Concerned Scientists, Cambridge, Massachusetts. Provided testimony to the U.S. Senate/House Joint Committee on Atomic Energy, the U.S. House Committee on Interior and Insular Affairs, the California Assembly, Land Use, and Energy Committee, the Advisory Committee on Reactor Safeguards, and the Atomic Safety and Licensing Board. Performed comprehensive risk analysis of the accident probabilities and consequences at the Barseback Nuclear Plant for the Swedish Energy Commission and edited, as well as contributed to, the Union of Concerned Scientist's technical review of the NRC's Reactor Safety Study (WASH-1400).

2/76 - 9/76

Consultant, Project Survival, Palo Alto, California.  
Volunteer work on Nuclear Safeguards Initiative campaigns in California, Oregon, Washington, Arizona, and Colorado. Numerous presentations on nuclear power and alternative energy options to civic, government, and college groups. Also resource person for public service presentations on radio and television.



5/75 - 1/76

Manager - Quality Assurance Section, Nuclear Energy Control and Instrumentation Department, General Electric Company, San Jose, California. Report to the Department General Manager. Develop and implement quality plans, programs, methods, and equipment which assure that products produced by the Department meet quality requirements as defined in NRC regulation 10 CFR 50, Appendix B, ASME Boiler and Pressure Vessel Code, customer contracts, and GE Corporate policies and procedures. Product areas include radiation sensors, reactor vessel internals, fuel handling and servicing tools, nuclear plant control and protection instrumentation systems, and nuclear steam supply and Balance of Plant control room panels. Responsible for approximately 45 exempt personnel, 22 non-exempt personnel, and 129 hourly personnel with an expense budget of nearly 4 million dollars and equipment investment budget of approximately 1.2 million dollars.

11/71 - 5/75

Manager - Quality Assurance Subsection, Manufacturing Section of Atomic Power Equipment Department, General Electric Company, San Jose, California. Report to the Manager of Manufacturing. Same functional and product responsibilities as in Engagement #1, except at a lower organizational report level. Developed a quality system which received NRC certification in 1975. The system was also successfully surveyed for ASME "N" and "NPT" symbol authorization in 1972 and 1975, plus ASME "U" and "S" symbol authorizations in 1975. Responsible for from 23 to 39 exempt personnel, 7 to 14 non-exempt personnel, and 53 to 97 hourly personnel.

3/70 - 11/71

Manager - Application Engineering Subsection, Nuclear Instrumentation Department, General Electric Company, San Jose, California. Responsible for the post order technical interface with architect engineers and power plant owners to define and schedule the instrumentation and control systems for the Nuclear Steam Supply and Balance of Plant portion of nuclear power generating stations. Responsibilities included preparation of the plant instrument list with approximate location, review of interface drawings to define functional design requirements, and release of functional requirements for detailed equipment designs. Personnel supervised included 17 engineers and 5 non-exempt personnel.

12/69 - 3/70

Chairman - Equipment Room Task Force, Nuclear Instrumentation Department, General Electric Company, San Jose, California. Responsible for a special task force reporting to the Department General Manager to define methods to improve the quality and reduce the

installation time and cost of nuclear power plant control rooms. Study resulted in the conception of a factory-fabricated control room consisting of signal conditioning and operator control panels mounted on modular floor sections which are completely assembled in the factory and thoroughly tested for proper operation of interacting devices. Personnel supervised included 10 exempt personnel.

12/65 - 12/69

Manager - Proposal Engineering Subsection, Nuclear Instrumentation Department, General Electric Company, San Jose, California.

Responsible for the application of instrumentation systems for nuclear power reactors during the proposal and pre-order period. Responsible for technical review of bid specifications, preparation of technical bid clarifications and exceptions, definition of material list for cost estimating, and the "as sold" review of contracts prior to turnover to Application Engineering. Personnel supervised varied from 2 to 9 engineers.

8/64 - 12/65

Sales Engineer, Nuclear Electronics Business Section of Atomic Power Equipment Department, General Electric Company, San Jose, California.

Responsible for the bid review, contract negotiation, and sale of instrumentation systems and components for nuclear power plants, test reactors, and radiation hot cells. Also responsible for industrial sales of radiation sensing systems for measurement of chemical properties, level, and density.

10/61 - 8/64

Application Engineer, Low Voltage Switchgear Department, General Electric Company, Philadelphia, Pennsylvania

Responsible for the application and design of advanced diode and silicon-controlled rectifier (SCR) constant voltage DC power systems and variable voltage DC power systems for industrial applications. Designed, followed manufacturing and personally tested an advanced SCR power supply for product introduction at the Iron and Steel Show. Project Engineer for a DC power system for an aluminum pot line provided to Anaconda beginning at the 161KV switchyard and encompassing all the equipment to convert the power to 700 volts DC at 160,000 amperes.

9/60 - 10/61

GE Rotational Training Program

Four 3-month assignments on the GE Rotational Training Program for college technical graduates as follows:

- a. Installation and Service Eng. - Detroit, Michigan  
Installation and startup testing of the world's largest automated hot strip steel mill.
- b. Tester - Industry Control - Roanoke, Virginia  
Factory testing of control panels for control of steel, paper, pulp, and utility mills and power plants.
- c. Engineer - Light Military Electronics - Johnson City, New York  
Design of ground support equipment for testing the auto pilots on the F-105.
- d. Sales Engineer - Morrison, Illinois  
Sales of appliance controls including range timers and refrigerator cold controls.

#### EDUCATION:

Bachelor of Science Electrical Engineering, University of Arizona, 1960.

Master of Business Administration, University of Santa Clara, 1969.

#### PROFESSIONAL AFFILIATION:

Registered Quality Engineer, License No. QUP25, State of California.

Member of Subcommittee 8 of the Nuclear Power Engineering Committee of the IEEE Power Engineering Society responsible for the preparation and revision of the following national Q.A. Standards:

- a. IEEE 498 (ANSI N45.2.16): Requirements for the Calibration and Control of Measuring and Test Equipment used in the Construction and Maintenance of Nuclear Power Generating Stations.
- b. IEEE 336 (ANSI N45.2.4): Installation, Inspection, and Testing Requirements for Class 1E Instrumentation and Electric Equipment at Nuclear Power Generating Stations.
- c. IEEE 467 : Quality Assurance Program Requirements for the Design and Manufacture of Class 1E Instrumentation and Electric Equipment for Nuclear Power Generating Stations.

I am currently a member of the IEEE Committee which is preparing a standard relating to the selection and utilization of replacement parts for Class 1E equipment during the construction and operation phase.

PUBLICATIONS AND TESTIMONY:

1. In-Core System Provides Continuous Flux Map of Reactor Cores, R. B. Hubbard and C. E. Foreman, Power, November, 1967.
2. Quality Assurance: Providing It, Proving It, R. B. Hubbard, Power, May, 1972.
3. Testimony of R. B. Hubbard, D. G. Bridenbaugh, and G. C. Minor before the United States Congress, Joint Committee on Atomic Energy, February 18, 1976, Washington, D.C. (Published by the Union of Concerned Scientists, Cambridge, Massachusetts.) Excerpts from testimony published in Quote Without Comment, Chemtech, May, 1976.
4. Testimony of R. B. Hubbard, D. G. Bridenbaugh, and G. C. Minor to the California State Assembly Committee on Resources, Land Use, and Energy, Sacramento, California, March 8, 1976.
5. Testimony of R. B. Hubbard and G. C. Minor before California State Senate Committee on Public Utilities, Transit, and Energy, Sacramento, California, March 23, 1976.
6. Testimony of R. B. Hubbard and G. C. Minor, Judicial Hearings Regarding Grafenrheinfeld Nuclear Plant, March 16 & 17, 1977, Wurzburg, Germany.
7. Testimony of R. B. Hubbard to United States House of Representatives, Subcommittee on Energy and the Environment, June 30, 1977, Washington, D.C., entitled, Effectiveness of NRC Regulations - Modifications to Diablo Canyon Nuclear Units.
8. Testimony of R. B. Hubbard to the Advisory Committee on Reactor Safeguards, August 12, 1977, Washington, D.C., Risk Uncertainty Due to Deficiencies in Diablo Canyon Quality Assurance Program and Failure to Implement Current NRC Practices.
9. The Risks of Nuclear Power Reactors: A Review of the NRC Reactor Safety Study WASH-1400, Kendall, et. al., edited by R. B. Hubbard and G. C. Minor for the Union of Concerned Scientists, August, 1977.
10. Swedish Reactor Safety Study: Barseback Risk Assessment, MHB Technical Associates, January 1978 (Published by Swedish Department of Industry as Document DSI (1978:1).
11. Testimony of R. B. Hubbard before the Energy Facility Siting Council, March 31, 1978, in the matter of Pebble Springs Nuclear Power Plant, Risk Assessment: Pebble Springs Nuclear Plant, Portland, Oregon.



12. Presentation by R. B. Hubbard before the Federal Ministry for Research and Technology (BMFT), August 31 and September 1, 1978, Meeting on Reactor Safety Research, Risk Analysis. Bonn, Germany.
13. Testimony by R. B. Hubbard, D. G. Bridenbaugh, and G. C. Minor before the Atomic Safety and Licensing Board, September 25, 1978, in the matter of the Black Fox Nuclear Power Station Construction Permit hearings, Tulsa, Oklahoma.
14. Testimony of R. B. Hubbard before the Atomic Safety and Licensing Board, November 17, 1978, in the matter of Diablo Canyon Nuclear Power Plant Operating License Hearings, Operating Basis Earthquake and Seismic Reanalysis of Structures, Systems, and Components, Avila Beach, California.
15. Testimony of R. B. Hubbard and D. G. Bridenbaugh before the Louisiana Public Service Commission, November 19, 1978, Nuclear Plant and Power Generation Costs, Baton Rouge, Louisiana.
16. Testimony of R. B. Hubbard before the California Legislature, Subcommittee on Energy, Los Angeles, April 12, 1979.
17. Testimony of R. B. Hubbard and G. C. Minor before the Federal Trade Commission, on behalf of the Union of Concerned Scientists, Standards and Certification Proposed Rule 16 CFR Part 457, May 18, 1979.
18. ALO-62, Improving the Safety of LWR Power Plants, MHB Technical Associates, prepared for U.S. Department of Energy, Sandia National Laboratories, September, 1979, available from NTIS.
19. Testimony by R. B. Hubbard before the Arizona State Legislature, Special Interim House Committee on Atomic Energy, Overview of Nuclear Safety, Phoenix, AZ, September 20, 1979.
20. "The Role of the Technical Consultant", Practising Law Institute program on "Nuclear Litigation", New York City and Chicago, November, 1979. Available from PLI, New York City.
21. Uncertainty in Nuclear Risk Assessment Methodology, MHB Technical Associates, March, 1980, prepared for and available from Swedish Nuclear Power Inspectorate, Stockholm, Sweden.
22. Italian Reactor Safety Study: Caorso Risk Assessment, MHB Technical Associates, March, 1980, prepared for and available from Friends of the Earth, Rome, Italy.

23. Development of Study Plans: Safety Assessment of Monticello and Prairie Island Nuclear Stations, MHB Technical Associates, August, 1980, prepared for and available from the Minnesota Pollution Control Agency.
24. Affidavit of Richard B. Hubbard and Gregory C. Minor before the Illinois Commerce Commission, In the Matter of an Investigation of the Plant Construction Program of the Commonwealth Edison Company, prepared for the League of Women Voters of Rockford, Illinois, November 12, 1980, ICC Case No. 78-0646.
25. Systems Interaction and Single Failure Criterion, MHB Technical Associates, January, 1981, prepared for and available from the Swedish Nuclear Power Inspectorate, Stockholm, Sweden.
26. Summary of Emergency Response Planning Criteria for Regional and Local Authorities Near Nuclear Electric Generating Stations, MHB Technical Associates, June, 1981, prepared for and available from Friends of the Earth, Rome, Italy.
27. Economic Assessment: Ownership Interest In Palo Verde Nuclear Station, September 11, 1981, prepared for and available from the City of Riverside, California.
28. Systems Interaction and Single Failure Criterion: Phase II report, MHB Technical Associates, December, 1981, prepared for and available from the Swedish Nuclear Power Inspectorate, Stockholm, Sweden.
29. Testimony of Richard Hubbard and Gregory Minor on Emergency Response Planning, Diablo Canyon Operating License hearings before ASLB, January 11, 1982.
30. Statement of Richard Hubbard before the U.S. House Subcommittee on Energy and Environment concerning QA program breakdowns, November 19, 1981.
31. Testimony of Richard Hubbard on Quality Assurance, South Texas Operating License hearing before ASLB, prefiled June, 1981.
32. Presentation of Richard Hubbard for Governor Edmund G. Brown, jr. concerning PG&E's Proposed Seismic Design Reverification Program, Diablo Canyon Nuclear Power Plant, February 1982.
33. Testimony of R. B. Hubbard, G. C. Minor, M. W. Goldsmith, S. J. Harwood on behalf of Suffolk County, before the Atomic Safety and Licensing Board, in the matter of Long Island Lighting Company, Shoreham Nuclear Power Station, Unit 1, regarding Contention 7B, Safety Classification and Systems Interaction, April 13, 1982.

34. Testimony of R. B. Hubbard and D. G. Bridenbaugh, in the matter of Jersey Central Power and Light Company For an Increase in Rates for Electrical Service, on behalf of New Jersey Department of the Public Advocate, Division of Rate Counsel, Three Mile Island Units 1 & 2, Cleanup and Modification Programs, May, 1982.
35. Testimony of R. B. Hubbard and G. C. Minor on behalf of Suffolk County, before the Atomic Safety and Licensing Board, in the matter of Long Island Lighting Company, Shoreham Nuclear Power Station, Unit 1, regarding Suffolk County Contention 27 and SOC Contention 3, Post-Accident Monitoring, May 25, 1982.
36. Presentation of R. B. Hubbard for Governor Edmund G. Brown, Jr. concerning Diablo Canyon Reverification Program, Diablo Canyon Nuclear Power Plant, September, 1982.
37. Testimony of R. B. Hubbard on behalf of Suffolk County, before the Atomic Safety and Licensing Board, in the matter of Long Island Lighting Company, Shoreham Nuclear Power Station, Unit 1, regarding Suffolk County Contentions 12, 13, 14, and 15, Quality Assurance/Quality Control, June 29, 1982.
38. Presentation of Richard B. Hubbard on Behalf of the State of California, Before the NRC Commissioners, Proposed Phase II Diablo Canyon Reverification Program (IDVP), November 10, 1982.
39. Testimony of R. B. Hubbard and Dr. Francisco J. Samaniego on behalf of Suffolk County, Before the Atomic Safety and Licensing Board, in the matter of Long Island Lighting Company, Shoreham Nuclear Power Station, Unit 1, regarding Torrey Pines Technology's Inspection of Shoreham Nuclear Power Station, December 21, 1982.
40. Supplemental testimony of G. C. Minor, R. B. Hubbard, and M. W. Goldsmith on behalf of Suffolk County, before the Atomic Safety and Licensing Board, in the matter of Long Island Lighting Company, Shoreham Nuclear Power Station, Unit 1, regarding Suffolk County Contention 7B, Safety Classification and Systems Interaction, March 23, 1983.
41. Supplemental Affidavit of R. B. Hubbard before the Atomic Safety and Licensing Appeal Board Concerning Breakdowns in the Diablo Canyon Quality Assurance Program, March 29, 1983.
42. Declaration of R. B. Hubbard before the Atomic Safety and Licensing Appeal Board, Concerning Breakdowns in Construction Quality Assurance at Diablo Canyon, May 6, 1983.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Thomas S. Moore, Chairman  
Dr. John H. Buck  
Dr. W. Reed Johnson

December 19, 1983  
(ALAB-756)

In the Matter of	)	
	)	
PACIFIC GAS AND ELECTRIC COMPANY	)	Docket Nos. 50-275 OL
	)	50-323 OL
(Diablo Canyon Nuclear Power	)	
Plant, Units 1 and 2)	)	

Joel R. Reynolds, John R. Phillips and Eric Havian,  
Los Angeles, California, and David S. Fleischaker,  
Oklahoma City, Oklahoma, for the San Luis  
Obispo Mothers for Peace, et al., joint  
intervenors.

John K. Van DeKamp, Attorney General of the State of  
California, Andrea Sheridan Ordin, Michael J.  
Strumwasser, Susan L. Durbin and Peter H. Kaufman,  
Los Angeles, California, for George Deukmejian,  
Governor of the State of California.

Robert Ohlbach, Philip A. Crane, Jr., and Richard E.  
Locke, San Francisco, California, and Arthur C. Gehr  
and Bruce Norton, Phoenix, Arizona, for Pacific Gas  
and Electric Company, applicant.

Lawrence J. Chandler and Henry J. McGurren, for the  
Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

We are faced with the question whether the record in this operating license proceeding should be reopened to consider new evidence on the alleged inadequacy of the construction quality assurance program utilized by the Pacific Gas and Electric Company in the construction of the

63-12210084



Diablo Canyon facility. In our order of October 24, 1983 we answered that question in the negative. The reasons for our decision are detailed below.

# I

Citing the discovery of significant new evidence of deficiencies in the Diablo Canyon construction quality assurance program, the joint intervenors moved on May 10, 1983 to reopen the record in this proceeding.<sup>1</sup> Shortly thereafter, on May 18, 1983, the Governor of the State of California filed a similar motion to reopen the record. These motions followed in the wake of earlier ones by the joint intervenors and the Governor to reopen the record on all aspects of quality assurance (i.e., design and construction) for the Diablo Canyon plant. Although the applicant and the NRC staff initially opposed the prior motions in their entirety, they subsequently conceded that

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<sup>1</sup> The joint intervenors' motion also seeks vacation of the Licensing Board's summary findings on the adequacy of the Diablo Canyon construction quality assurance program contained in the Board's July 17, 1981 partial initial decision authorizing fuel loading and low power testing, and revocation of the low power license issued pursuant to that authorization. See LBP-81-21, 14 NRC 107 (1981). In ALAB-728, 17 NRC 777 (1983), we affirmed the authorization for fuel loading and low power testing. That decision also contains a recitation of the recent history of this proceeding. Because the joint intervenors' supplemental requests necessarily are dependent on the outcome of the reopening question, they also are denied.

the motions met the adjudicatory standards for reopening the record on the design phase of the quality assurance program. We agreed and ordered the proceeding reopened on the issue of design quality assurance but declined to rule at that time on the construction quality assurance issue because of the procedural posture of the case.<sup>2</sup>

Following the filing of the new motions concerning the latter issue, the applicant and staff continued vigorously to oppose any reopening of the record on the issue of construction quality assurance. They both filed extensive responses to the May 1983 motions, accompanied by numerous affidavits and other supporting documents, setting forth the reasons and the factual bases for their opposition. By our leave,<sup>3</sup> both the joint intervenors and the Governor filed replies to those responses.

Owing to the voluminous filings and the number of unanswered questions we had concerning the exact nature and significance of the new evidence, we set the motions for hearing so that these questions could be more fully

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<sup>2</sup> See Memorandum and Order of April 21, 1983 (unpublished).

<sup>3</sup> See Order of June 7, 1983 (unpublished). Under 10 CFR 2.730(c), a moving party has no right to reply to a response to a motion.

explored.<sup>4</sup> Further, because of the importance of quality assurance in the Commission's scheme for regulating the construction of nuclear power plants<sup>5</sup> and our desire to be as informed as possible on the factual claims of the parties, we allowed movants to supplement their previous filings with any new evidence not already submitted.<sup>6</sup> Commencing on July 19, 1983, a four-day hearing on the motions was held near the plant's site at San Luis Obispo, California, where the parties were afforded an opportunity to cross-examine each other's affiants.

The joint intervenors and the Governor advance a number of arguments in support of their motions to reopen. In general, they follow four lines: (1) errors in the applicant's design quality assurance program suggest the existence of errors in the construction quality assurance program; (2) newly found deficiencies in the construction quality assurance programs of several of the applicant's contractors indicate that further quality assurance program errors, as well as construction errors, exist; (3) the applicant's alleged lack of commitment to implement the

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<sup>4</sup> See Order of June 28, 1983 (unpublished).

<sup>5</sup> See, e.g., Vermont Yankee Nuclear Power Corp. (Vermont Yankee Nuclear Power Station), ALAB-124, 6 AEC 358, 361-62 (1973).

<sup>6</sup> See Order of June 28, 1983, supra.

Commission's quality assurance regulations confirms the existence of flaws in the applicant's construction quality assurance program; and (4) the extensive nature and rapid pace of recent modification work following the discovery of design errors at the plant suggest the need to monitor the present construction quality assurance program. We consider these arguments below.

## II

The proponents of a motion to reopen the record in a licensing proceeding carry "a heavy burden." Kansas Gas and Electric Co. (Wolf Creek Generating Station, Unit No. 1), ALAB-462, 7 NRC 320, 338 (1978). To prevail,

[t]he 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); . . . 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).

Id. See also Pacific Gas and Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-598, 11 NRC 876, 879 (1980). All parties agree that this tripartite test controls our decision.

Although the timeliness of the May 1983 motions is not in dispute, the applicant contests the assertions of the



joint intervenors and the Governor that the new evidence establishes a significant safety issue and, that had the evidence previously been known, a different result would have been reached. For its part, the staff rests its opposition on the "significant safety issue" criterion. We turn, therefore, to the second prong of the Wolf Creek standard. Because we conclude that the new evidence presented by the joint intervenors and the Governor lacks the requisite safety significance on the issue of construction quality assurance, we reach no other question.

To determine what constitutes a "significant safety issue" for motions predicated on alleged deficiencies in the applicant's construction quality assurance program, we need to bear in mind the enormous size and complexity of this nuclear power plant. The Diablo Canyon facility has been under construction since 1968<sup>7</sup> and has entailed costs running into the billions of dollars. Its construction has required millions of hours of work by thousands of workers with vast ranges of differing skills. By virtue of the sheer size and complexity of the plant, it is inevitable

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<sup>7</sup> The construction permits were issued for Units 1 and 2 on April 23, 1968 and December 9, 1970, respectively.

that errors will occur in the course of construction. Although a program of construction quality assurance is specifically designed to catch construction errors, it is unreasonable to expect the program to uncover all errors. In short, perfection in plant construction and the facility construction quality assurance program is not a precondition for a license under either the Atomic Energy Act or the Commission's regulations. What is required instead is reasonable assurance that the plant, as built, can and will be operated without endangering the public health and safety. 42 U.S.C. 2133(d), 2232(a); 10 CFR 50.57(a)(3)(i); Power Reactor Development Co. v. International Union, 367 U.S. 396, 407 (1961); Maine Yankee Atomic Power Co. (Maine Yankee Atomic Power Station), ALAB-161, 6 AEC 1003, 1004 (1973), aff'd sub nom. Citizens for Safe Power v. NRC, 524 F.2d 1291 (D.C. Cir. 1975).

It is in this context that the movants' evidence of alleged quality assurance deficiencies must be addressed. In order for new evidence to raise a "significant safety issue" for purposes of reopening the record, it must establish either that uncorrected construction errors endanger safe plant operation, or that there has been a breakdown of the quality assurance program sufficient to raise legitimate doubt as to the plant's capability of being operated safely. See Union Electric Co. (Callaway Plant, Unit 1), ALAB-740, 18 NRC \_\_\_, \_\_\_ (September 14, 1983)

(slip opinion at 2-3).<sup>8</sup>

### III

A. The joint intervenors and the Governor argue that the existence of deficiencies in the design quality assurance program not only justifies reopening on that issue (as has already been ordered), but requires reopening on construction quality assurance matters as well. They assert that the correspondence of several of the same factors that led to inadequacies in the design aspects of the quality assurance program compels an inference that the applicant's construction quality assurance program for the plant was also deficient. Specifically, they point to the same top management that ran both aspects of the program and the same quality assurance manual that governed both activities.

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<sup>8</sup> As noted earlier, the Governor concedes the applicability of the Wolf Creek criteria for reopening the hearing record. But the Governor, relying on a statement contained in Vermont Yankee Nuclear Power Corp. (Vermont Yankee Nuclear Power Station), ALAB-138, 6 AEC 520, 523-24 (1973), claims that his reopening motion must be granted if he has timely presented newly discovered evidence addressed to a significant safety issue and the moving papers are strong enough, in light of opposing filings, to avoid summary disposition. The analogy in Vermont Yankee to summary disposition (i.e., that a motion for reopening must be supported by evidence that is at least equivalent to that necessary to avoid a motion for summary disposition) should not be interpreted to mean that such evidence is all that is ever necessary to meet the test for reopening. To so conclude would, for all practical purposes, relieve movants

(Footnote Continued)

The movant's evidence on this point falls far short of establishing their asserted inference. Although at Diablo Canyon both design and construction quality assurance are parts of a single program, the historical development, organizational structure and responsibilities of each component are different. Similarly, the personnel skills, verification methods and corrective actions applicable to each phase of the programs are different.<sup>9</sup> Therefore, it simply does not follow that merely because the same top management is ultimately responsible for the entire quality assurance program and the details of the program are found in a single manual, the existence of defects in the design aspect of the program are symptomatic of like errors in the construction phase of the program. The many different elements and functioning of each component of the program are such that it would be gross speculation to arrive at the

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(Footnote Continued)

of the heavy burden imposed by Wolf Creek, supra, and decisions cited therein.

<sup>9</sup> See Affidavit of Richard S. Bain (July 1, 1982) and Affidavit of Warren A. Raymond Charles W. Dick and Michael J. Jacobson (July 2, 1982), accompanying Response of Pacific Gas and Electric Company To Joint Intervenor's Motion To Reopen The Record (July 2, 1982). These affidavits are incorporated by reference in Response Of Pacific Gas and Electric Company To Motions To Reopen The Record On Construction Quality Assurance (May 31, 1983).



movants' conclusion based on these two factors alone.<sup>10</sup> More important, however, is the fact that the joint intervenors and the Governor -- despite the additional opportunity presented by the hearing on their motions -- were unable to support their premise and establish construction quality assurance shortcomings sufficient to show a systematic breakdown in the quality assurance program or defects in the plant that may adversely affect its capability for safe operation.

B. The movants also rest their motions to reopen the record on certain specific areas of deficiency in the quality assurance programs of the applicant's contractors. In this connection, they focus primarily on three contractors: the H.P. Foley Company, the G.F. Atkinson Company, and the Wismer and Becker Company.

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<sup>10</sup> Both the joint intervenors and the Governor rely on the expert opinion of Richard B. Hubbard to support their position that the deficiencies in the applicant's design quality assurance program portend similar deficiencies in the construction quality assurance program. In like fashion, they depend upon Mr. Hubbard's opinion for support of most of their other arguments. Voir dire and cross-examination of Mr. Hubbard, however, established that he lacked experience and familiarity with construction work in general and with the Diablo Canyon construction quality assurance program. Tr. 39-42, 92-95, 105-110, 161-62. In the circumstances, Mr. Hubbard's opinion is entitled to little weight and it does nothing to enhance the movants' arguments.

1. The Foley Company was responsible for all of the electrical work at the plant and, from about 1977, for much of the completion of the plant's construction (i.e., the "clean-up" contractor). The joint intervenors and the Governor claim that the inadequacy of Foley's (and, in turn, the applicant's) construction quality assurance program is made manifest by several incidents and construction practices. Relying heavily on a sworn statement provided to the Governor's attorneys by a former quality assurance manager of the company, Virgil H. Tennyson, they assert that Foley's quality assurance organization, in contravention of the Commission's regulations, 10 CFR Part 50, Appendix B, I, lacks sufficient independence from the company officials responsible for production. On this score, they allude to statements made by Mr. Tennyson to the effect that he was constantly under pressure to shortcut quality assurance requirements in order that construction work could go forward. They stress, for example, an incident recounted by Mr. Tennyson in which red tags, used by the Foley construction quality assurance department to identify nonconforming work, were allegedly ordered removed by the company's project manager in violation of quality assurance procedures.

But when Mr. Tennyson was cross-examined at the hearing on the motions, a far different picture emerged from that painted by the joint intervenors and the Governor. Although

an incident involving the premature removal of red tags from nonconforming work did occur in violation of the company's quality assurance procedures, it appears that the physical corrections to the nonconforming work already had been performed before the tags were removed.<sup>11</sup> The same conclusion was reached by the staff after its investigation of the incident.<sup>12</sup> Moreover, the incident appears to be an isolated one. Thus, it neither establishes a systematic breakdown in Foley's construction quality assurance program nor demonstrates an uncorrected defect in the plant that adversely affects safe operation. Nor do we believe that the red tag incident, or other statements concerning the removal of red tags attributed to Foley's construction manager by Mr. Tennyson, demonstrate a lack of independence on the part of the quality assurance organization from the production department. In the context in which these statements were allegedly made, we believe the various remarks were little more than shorthand expressions to complete the inspection process in a timely manner, but not at the expense of proper

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<sup>11</sup> Tr. 652.

<sup>12</sup> See Inspection Report Nos. 50-275/83-13 and 50-323/83-10 (May 19, 1983) at 4, attached to Exhibit B of Affidavit of John D. Carlson (May 20, 1983), accompanying NRC Staff's Response To Motions To Reopen The Record on Construction Quality Assurance (June 6, 1983).

quality assurance procedures or the independence of that organization.<sup>13</sup>

Other aspects of Mr. Tennyson's sworn statement similarly fail to substantiate the joint intervenors' and the Governor's allegations of serious deficiencies in Foley's construction quality assurance program. The movants point to the recent large increase in construction work at Diablo Canyon. According to Mr. Tennyson, this "push," which started in late December 1982, resulted in the hiring of many new welders and quality assurance inspectors within a timeframe of approximately three months. In addition, the quantity of work required that the inspectors, among others, work long hours -- from sixty to seventy hours or more per week. All this, according to the joint intervenors and the governor, led to improper welds that escaped quality assurance detection and now must be made the subject of a broad reinspection program.

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<sup>13</sup> Tr. 336, 341-43, 350-52.

We note that in the opinion of the NRC senior resident inspector at Diablo Canyon, John Carlson, the quality assurance organization enjoyed sufficient independence within the company's corporate structure. He stated that although Foley's organizational structure was such that both production and quality management reported to the senior project manager at the site, the quality assurance manager had direct access to the company's regional vice-president in the company's corporate offices in California. Tr. 900-01.



During this period of a rapidly expanding work force, a number of minor welding deficiencies escaped Foley's quality control inspections.<sup>14</sup> But such incidents are not unusual in construction and can be expected, even with qualified and experienced people, until the newly hired workers and inspectors become used to the new conditions, requirements and other aspects of the work environment.<sup>15</sup> The important point is that the problems were recognized and caught by the applicant almost from their inception and it quickly took steps to correct them. The applicant closely monitored the situation and conducted a total of ten audits of Foley's work during this period so as to bring all the work up to acceptable standards.<sup>16</sup> Thus, rather than establishing a pervasive failure of the applicant's quality assurance program, this incident demonstrates that the applicant's construction quality assurance program was performing in an acceptable manner.<sup>17</sup>

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<sup>14</sup> See Inspection Report Nos. 50-275/83-13 and 50-323/83-10 at 11, supra; Tr. 236-38, 898.

<sup>15</sup> Tr. 805-07.

<sup>16</sup> Tr. 562-72.

<sup>17</sup> The movants also cite Mr. Tennyson's sworn statement concerning an incident of harassment of a quality assurance inspector by an iron worker as evidence of Foley's deficient quality assurance program. According to Mr. Tennyson, such harassment was reported to the Foley project manager but, as  
(Footnote Continued)

2. Like the H.P. Foley Company, the G.F. Atkinson Company and the Wismer and Becker Company were major contractors for the Diablo Canyon plant. The former was responsible for the erection of the containment structure while the latter installed the primary coolant system piping. Asserted deficiencies found by a review of the construction performed by these contractors also form part of the basis for the joint intervenors' and the Governor's assertions that the record should be reopened on the issue of the applicant's quality assurance program.

In the fall of 1981, the applicant discovered errors in the assignment of seismic design spectra for equipment and piping in portions of the containment annulus of Unit 1. These errors, in conjunction with the discovery of additional problems with the applicant's design quality assurance program, prompted the Commission to order the applicant to undertake an independent design verification program to assure the adequacy of the Diablo Canyon

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(Footnote Continued)

far as Mr. Tennyson was aware, nothing was done to curtail it. The record, however, shows that the errant iron worker was immediately dismissed as a result of the harassment. See Affidavit of Richard S. Bain, James R. Manning and Richard D. Etzler (May 31, 1983) at 14, accompanying Response of Pacific Gas and Electric Company To Motions To Reopen The Record On Construction Quality Assurance (May 31, 1983) [hereinafter "BME Affidavit (May 31, 1983)"].

design.<sup>18</sup> While the program was in progress, and as an adjunct to it, the applicant commissioned the same organizations performing the design review to examine the containment structure construction and the primary coolant system piping. The applicant undertook this, at the urging of the NRC regional staff, to confirm the adequacy of the construction of Diablo Canyon and to verify that the staff inspection efforts had not allowed significant undetected deficiencies.<sup>19</sup> Although a number of contractors were involved in constructing the applicant's facility, the independent reviewers selected the construction performed by the Atkinson Company and the Wismer and Becker Company (and their subcontractors) because that construction was both substantial and involved structures or components vitally important for safe operation of the plant.<sup>20</sup> This review resulted in a favorable finding on both the adequacy of the applicable quality assurance programs and the construction.<sup>21</sup>

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<sup>18</sup> See CLI-81-30, 14 NRC 950 (1981).

<sup>19</sup> See Affidavit of Philip J. Morrill (June 2, 1983) at 3, accompanying NRC Staff's Response To Joint Intervenor's and Governor Deukmejian's Motions To Reopen The Record (June 6, 1983).

<sup>20</sup> Id.

<sup>21</sup> Id. See also Attachment 3, Interim Technical Report  
(Footnote Continued)

The joint intervenors and the Governor, however, dispute the validity of these conclusions. They assert that the deficiencies uncovered by the review stand as evidence that the applicant's construction quality assurance program and those of its contractors were not functioning properly. Further, they claim that no conclusions can be drawn from the review about the adequacy of construction by other contractors working on the plant because of the limited nature of the review (i.e., only two of twelve contractors were examined).

Although the review did result in the finding of a number of errors, these deficiencies were essentially matters of minor significance and were generally the result of close decisions by the reviewing personnel on items that had called for the exercise of similar judgments by the contractors' quality control personnel.<sup>22</sup> None of the deficiencies required any physical modifications.<sup>23</sup> Moreover, the review was conducted on work performed as far back as eight years earlier using today's more stringent

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(Footnote Continued)

No. 36 (Revision 1) and Attachment 4, Interim Technical Report No. 38 (Revision 2), accompanying Response of Pacific Gas and Electric Company To Motions To Reopen The Record (May 31, 1983) [hereinafter "ITR 36" and "ITR 38"].

<sup>22</sup> Tr. 428-40.

<sup>23</sup> See ITR 36 and ITR 38.



quality standards and not those applicable to the period of the actual construction.<sup>24</sup> Thus, in the circumstances, the number of errors discovered by the review is neither surprising nor particularly meaningful. What is important is that none of the deficiencies represents any defect adversely affecting the safe operation of the plant or a systematic breakdown of the applicable construction quality assurance programs.

In addition, the movants' assertion that the independent construction review was too narrow to enable any statistically valid conclusions to be drawn about the quality of the work of the contractors not examined misses the point. On motions by the joint intervenors and the Governor to reopen the record on the issue of construction quality assurance, it is not incumbent upon the applicant to establish the adequacy of its construction quality assurance program or the adequacy of the construction at Diablo Canyon.<sup>25</sup> Therefore, given the results of the limited independent review (i.e., both the construction and construction quality assurance programs of two major contractors was adequate), we fail to see how the applicant's decision not to review the work of all the other

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<sup>24</sup> Tr. 429-31.

<sup>25</sup> See p. 5 supra.

plant contractors casts suspicion on the adequacy of any of the unreviewed programs or construction work.

It is, of course, possible that a review of the work of the remaining contractors might lead to the discovery of serious construction or construction quality assurance flaws. But the theoretical possibility of such discoveries is insufficient. To demonstrate the need for additional construction quality review, the movants must either establish construction errors that endanger safe plant operation or show a pervasive failure of the quality assurance programs sufficient to raise legitimate doubt as to the adequacy of a plant's construction. The results of the independent construction review of the work performed by the Atkinson Company and the Wismer and Becker Company do neither.<sup>26</sup>

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<sup>26</sup> The movants also assert that numerous deviations in piping installations from what the movants label "as built" drawings, identified by the applicant and the independent construction review, show the failure of the applicant's construction quality assurance program. But the conclusion the joint intervenors and the Governor draw from these asserted discrepancies is unsupported by the record and evidences a misapprehension of the applicant's drawing procedures.

The applicant has had in place and followed appropriate drawing procedures from the beginning of the Diablo Canyon project. See BME Affidavit (May 31, 1983) at 2-5; Tr. 634-35. Further, the subject piping was correctly installed by the contractor in accordance with the design requirements on the area drawings and erection isometric

(Footnote Continued)

C. In a more general vein, the joint intervenors and the Governor contend that since 1970 the applicant's construction quality assurance program for Unit 1 has not complied with the Commission's quality assurance regulations, 10 CFR Part 50, Appendix B, because the applicant did not commit to conform its program to Appendix B after it became effective. Rather, the applicant only committed to apply Appendix B to the extent possible. Thus, they argue, the applicant effectively exempted its quality program from compliance with the regulations for post-1970 construction activities and the record must be reopened to ensure that Diablo Canyon was properly constructed.<sup>27</sup>

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(Footnote Continued)

drawings. See BME Affidavit (May 31, 1983) at 6-7; Tr. 618, 619-20, 634. Hence, there was no construction quality problem. Tr. 619, 626. The discrepancies cited by the movants were those between the design analysis isometric drawings and the actual installations. But those analysis drawings were not used in the field to erect piping. See BME Affidavit (May 31, 1983) at 7; Tr. 618, 619-20, 634. The apparent source of the problem was the failure of the applicant's engineering department timely to incorporate into the analysis drawings all the previously approved field changes so that the drawings at the time of the review conformed to the installed piping. See BME Affidavit (May 31, 1983) at 7-8; Tr. 626. We do not find this particular failure by the Pacific Gas and Electric Company engineering department to be significant from the standpoint of the applicant's construction quality assurance program.

<sup>27</sup> The joint intervenors point to the construction of certain raceway supports at Diablo Canyon using "Superstrut" material manufactured by the Midland-Ross Company as evidence of the applicant's failure to comply with Appendix B and to construct the facility properly. An NRC inspection

(Footnote Continued)

Although not expressly stated, seemingly implicit in movants' argument is the notion that the regulations required immediate compliance upon the effective date of Appendix B and that the applicant's commitment was insufficient to ensure a properly constructed facility. We disagree.

The Commission's predecessor, the Atomic Energy Commission, recognized in promulgating Appendix B in 1970 that the nature of the construction process for a plant already being built, such as Diablo Canyon, Unit 1, precluded the complete and immediate application of the quality assurance criteria. In the Statement of

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(Footnote Continued)

of the Midland-Ross facility determined that the manufacturer's quality assurance program was insufficient and not in conformance with Appendix B. See Board Notification No. 83-02 (January 7, 1983) and enclosure. Thereafter, the agency conducted an inspection at Diablo Canyon on the use of the material. That inspection concluded that the applicant's procurement and use of the material was generally consistent with Appendix B requirements applicable to off-the-shelf or commercial grade items. See Affidavit of Philip J. Morrill (June 2, 1983) at 6 and Exhibit C (Inspection Report Nos. 50-275/82-41, 50-323/82-19 (January 6, 1983)), accompanying NRC Staff's Response To Joint Intervenors' and Governor Deukmejian's Motions To Reopen The Record (June 6, 1983); Tr. 887-92. Further, we note that subsequent physical testing and evaluations of the Superstrut material indicate that it meets the design requirements for Diablo Canyon. Tr. 884. See Board Notification No. 83-14A (April 6, 1983) and enclosure. See also Pacific Gas and Electric Company and Bechtel Power Corporation "Final Report On The Evaluation Of Spot-welded Materials Used In Support Systems For Electrical Conduit and Cable Trays At Diablo Canyon Power Plant" (July 1, 1983).



Considerations accompanying the final version of Appendix B, it stated that the criteria would be "used for guidance in evaluating the adequacy of the quality assurance programs in use by holders of construction permits and operating licenses."<sup>28</sup> Therefore, contrary to the movants' suggestion, the applicant was not required to conform the construction quality assurance program for Unit 1 to Appendix B upon the provision's effective date. Moreover, the applicant's commitment in the Final Safety Analysis Report (FSAR) to apply the Appendix B criteria to the extent possible for the construction of Unit 1 was completely reasonable.<sup>29</sup> As stated by the applicant's assistant manager for nuclear plant operations, Warren A. Raymond:

We applied [Appendix B] as we possibly could. But you must remember that a great deal of the design and construction and procurement for Unit No. 1 had already been completed prior to the time that Apperdix B came into existence, and it's extremely difficult to try to apply all of those provisions to something which was done prior to the time that the regulation was enacted.<sup>30</sup>

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<sup>28</sup> 35 Fed. Reg. 10498, 10499 (1970) (emphasis supplied).

<sup>29</sup> See Diablo Canyon FSAR, § 17.0.

<sup>30</sup> Tr. 464.

The movants turn the applicant's commitment on its head by suggesting that it was a loophole that permitted the applicant to ignore construction quality assurance for Unit 1. Although Mr. Raymond further stated that it would take "an exhaustive review" to identify the construction work at

(Footnote Continued)

In the circumstances, the applicant's failure to conform the Diablo Canyon quality program to Appendix B in 1970 carries with it no suggestion, as the movants would have it, that the applicant's construction quality assurance program was insufficient to ensure a properly constructed facility.<sup>31</sup>

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(Footnote Continued)

Unit 1 performed under the quality assurance criteria of Appendix B and that such a review had not been undertaken, this fact does not translate into a conclusion that the applicant neglected construction quality assurance at Unit 1. Tr. 466. Indeed, as early as May 6, 1971 the staff noted in Inspection Report No. 50-275/71-1 at 9:

"a QA program . . . has been developed and implemented as required. The specific provisions of the QA program are set forth in a document entitled, "PG&E QA Manual, Diablo Canyon Unit No. 2." The staff confirmed that although the provisions of the document had been developed to meet the licensing requirements imposed for Unit No. 2 and the 18 criteria of Appendix B to 10 CFR Part 50, they are also applicable to Unit No. 1 with no distinction in the requirements between the two units.

See also Affidavit of J. M. Amaral (May 31, 1983), accompanying Response of Pacific Gas and Electric Company To Motions To Reopen The Record On Construction Quality Assurance (May 31, 1983) [hereinafter "Amaral Affidavit, May 31, 1983"].

<sup>31</sup> In addition, the joint intervenors and the Governor assert that the applicant's Diablo Canyon quality assurance program failed to comply with 10 CFR Part 50, Appendix A, General Design Criterion 1, which states, inter alia, that systems, structures and components "important to safety" must meet quality standards commensurate with their safety function. The movants argue that the Appendix A requirement is distinct from the Appendix B criteria applicable to "safety-related" systems, structures and components and that the applicant only complied with the latter requirement. Putting to one side the question of the correctness of the

(Footnote Continued)

D. Finally, as another reason to reopen the record on the issue of construction quality assurance, the Governor refers to the extensive amount of modification work being performed at the plant resulting from the design verification program. Specifically, the Governor argues that the applicant's deadlines for completing the modifications have placed such time pressures on the construction that errors are likely to result. According to the Governor, this factor, combined with the deficiencies already identified, establishes the need to reopen the record to examine the construction quality assurance program for the new work. The Governor's argument is unpersuasive.

The movants have failed to produce any reliable or persuasive evidence that the extent of recent construction activities has led to significantly faulty construction or a

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(Footnote Continued)

movants interpretation of Appendices A and B -- a matter about which we have considerable doubt -- they have not identified a single system, structure or component "important to safety" that the applicant's quality assurance program failed to cover. Moreover, the applicant published the Diablo Canyon FSAR designating those plant features subject to its construction quality assurance program in 1974. See Diablo Canyon FSAR, § 3.2. The staff accepted that designation the same year. See Safety Evaluation Report for Diablo Canyon (October 16, 1974) at 3.2.1. Although both documents have been publicly available since 1974, the movants waited until 1983 to assert this position in their motion to reopen the record. In the circumstances, the motion on this point is grossly out of time and cannot form the basis for reopening the record. See Wolf Creek, supra, at 338.

serious breakdown in quality control. Rather, it appears that the modification work has been adequately planned and coordinated. In addition, this work has been subjected to an aggressive program of quality assurance inspections and audits by the staff and the applicant which has insured that the minor deficiencies uncovered have been corrected.<sup>32</sup> Further, as explained by Allan Johnson and Bobby Faulkenberry, Enforcement Officer and Deputy Regional Administrator, respectively, of the Commission's Region V office, shakedown errors can be expected at the beginning of any large construction work.<sup>33</sup> Moreover, Mr. Faulkenberry, in his review of the inspection history of Diablo Canyon from 1969 to the present time -- a program amounting to some 20 to 25 man-years of effort and covering the activities of all contractors on the site -- did not find the applicant's noncompliance record out of the ordinary. Indeed, he found the noncompliance rate "about average, or possibly even on the low side."<sup>34</sup> This being so, in the absence of evidence of serious construction quality assurance breakdowns in connection with the modification work now going on at the

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<sup>32</sup> See BME Affidavit (May 31, 1983) at 9-15; Amaral Affidavit (May 31, 1983) at 2-3. See also Inspection Report Nos. 50-275/83-29 and 50-323/83-21 (October 7, 1983).

<sup>33</sup> Tr. 805-08.

<sup>34</sup> Tr. 807, 820-22.



plant, no justification is presented for reopening of the record.

We have also considered the other allegations of construction quality assurance deficiencies made by the movants. We find them without merit.<sup>35</sup>

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<sup>35</sup> Some six weeks after the hearing on the motions to reopen the record, the joint intervenors filed a "supplement" to their earlier motion based upon an October 27, 1977 independent audit report critical of the quality assurance program of Pullman Power Products (one of the applicant's major contractors for piping other than the primary coolant system). The audit, conducted by Nuclear Services Corporation (NSC) in the late summer of 1977, covered a period from 1971 to 1977 and identified a large number of purported deficiencies in the Pullman program. The joint intervenors, joined by the Governor, argue that the report provides additional significant new evidence supporting their reopening motions on the issue of construction quality assurance.

The staff response indicates that a review of the NRC inspection reports for the period covered by the NSC audit shows the same kind of deficiencies in the Pullman program as those noted in the audit report. Therefore, the staff believes the audit findings reflect already corrected, isolated occurrences. The applicant's response contains a detailed history of the NSC audit and full documentation of subsequent actions taken by Pullman and Pacific Gas and Electric Company. That documentation shows that Pullman responded fully to each of the audit findings and, where appropriate, proposed corrective actions. See affidavit of Russell P. Wischow (September 21, 1983), Attachment 4, accompanying Pacific Gas and Electric Company Answer To Joint Intervenors' Supplement. The applicant reviewed the NSC audit findings with the Pullman responses and then conducted a separate audit of the Pullman quality assurance program, including a review of the installed hardware. The applicant's audit found three programmatic deficiencies and three deficiencies in the implementation of the program but concluded that the Pullman program generally met the applicable criteria. Id. at Attachments 5 and 6. The

(Footnote Continued)

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(Footnote Continued)

deficiencies identified by the applicant were then corrected. Id. at Attachment 7. The applicant also concluded that the NSC audit findings presented an inaccurate measure of the overall Pullman quality assurance program because many of the NSC findings inappropriately compared the Pullman program to 1977 standards rather than those applicable when the work was actually performed. Id. at 3.

The joint intervenors filed the "supplement" to their reopening motion without an accompanying motion for leave to file the document or an explanation of when they obtained the NSC audit report. Thus, their filing was in the teeth of our earlier admonition to joint intervenors with respect to such filings. See Memorandum and Order of April 21, 1983 (unpublished) at 2-4. We do not, however, reject the joint intervenors filing on that ground. We have carefully reviewed the NSC audit report and the responses of Pullman and the applicant. These lead us to conclude that the deficiencies identified by NSC in 1977 did not evidence a significant or systematic failure of the quality assurance program. See also Board Notification 83-188 (December 13, 1983) and enclosure.


Another potentially serious matter is raised by the NSC audit report. According to the joint intervenors, the report had not been disclosed previously even though the audit in question was conducted and the report written at about the time the Licensing Board was considering the adequacy of the quality assurance program at Diablo Canyon. Thus, a host of questions concerning the nondisclosure of the report await answers. But it is neither possible nor appropriate for us to address these questions on the materials at hand. Rather, this is a matter for the staff to investigate and, if appropriate, to take the necessary enforcement action. We expect the staff to inform us whether it is undertaking an investigation of this matter.

## IV

As is evident from our discussion above, we find that the joint intervenors and the Governor have failed to provide new evidence of a significant safety issue. Although there is some evidence of errors in both the applicant's construction quality assurance program and the construction at Diablo Canyon, we are unable to find that the errors are pervasive so as to indicate a breakdown in the construction quality assurance program and raise legitimate doubt as to the plant's capability of being operated safely. Nor can we find that any construction errors endanger safe plant operation. Accordingly, the motions of the joint intervenors and the Governor to reopen the record on the issue of construction quality assurance and for other relief are denied.

It is so ORDERED.

FOR THE APPEAL BOARD

  
C. Jean Shoemaker  
Secretary to the  
Appeal Board

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
BEFORE THE COMMISSION

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In the Matter of	)	
	)	
PACIFIC GAS AND ELECTRIC COMPANY	)	Docket Nos. 50-275 O.L.
	)	50-323 O.L.
	)	
(Diablo Canyon Nuclear Power	)	
Plant, Units 1 and 2)	)	
	)	
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CERTIFICATE OF SERVICE

I hereby certify that on this 9th day of January, 1984, I have served copies of the foregoing JOINT INTERVENORS' PETITION FOR REVIEW OF ALAB-756, mailing them through the U.S. mails, first class, postage prepaid.

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Washington, D.C. 20555

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