

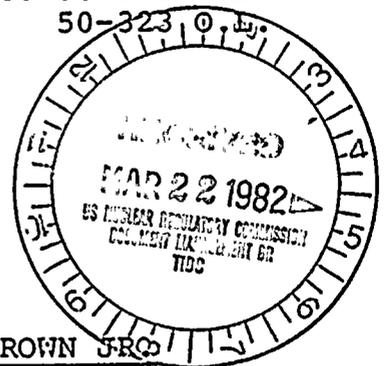
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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
OFFICE OF SECRETARY
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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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.



BRIEF OF PROPOSED FINDINGS
OF FACT AND CONCLUSIONS OF LAW
SUBMITTED ON BEHALF OF GOVERNOR EDMUND G. BROWN JR.

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March 19, 1982

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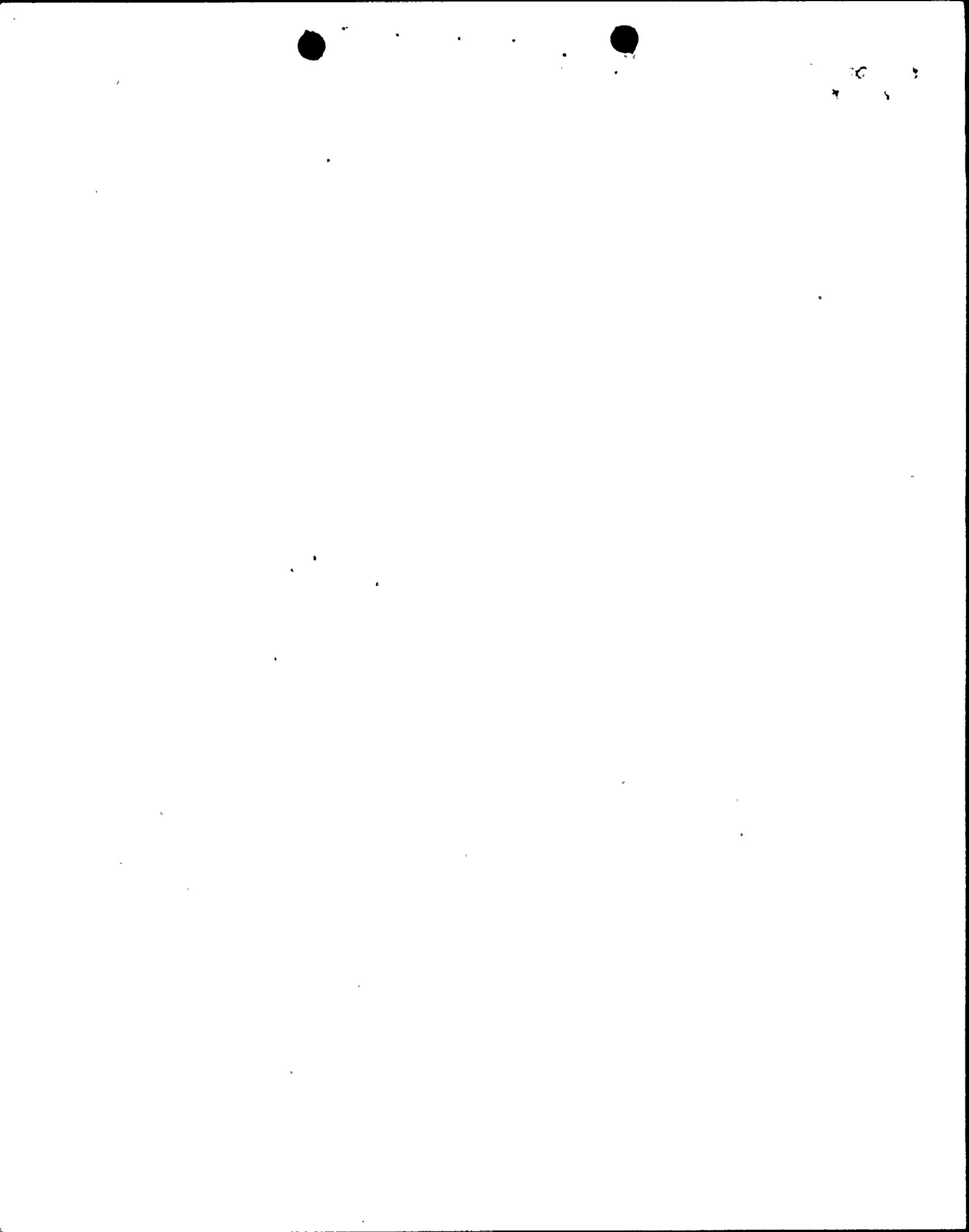
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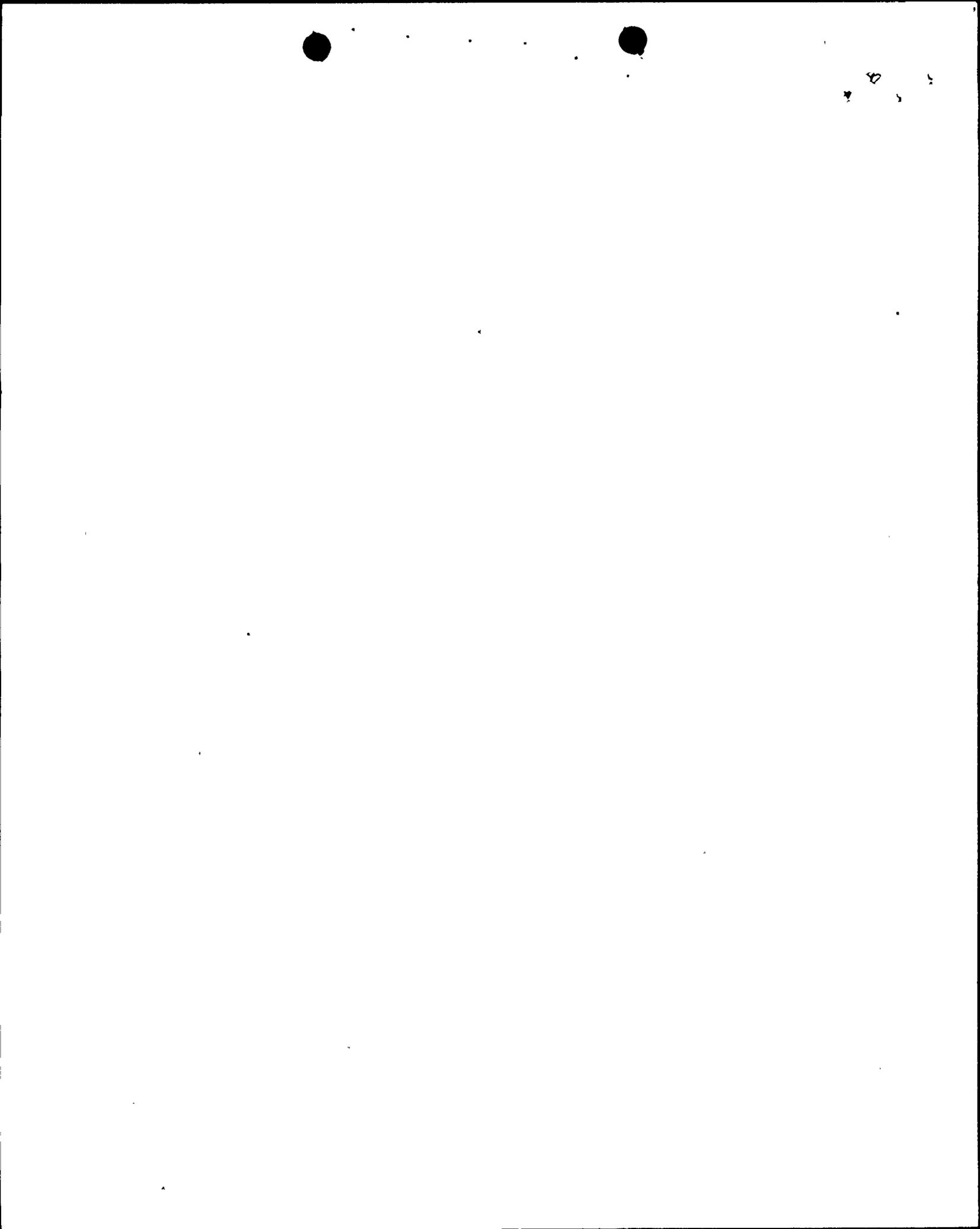
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NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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(Diablo Canyon Nuclear Power Plant,)
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BRIEF OF PROPOSED FINDINGS
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Procedural History

This Licensing Board conducted an evidentiary hearing on January 19-26, 1982, in Avila Beach, California. The participants were Pacific Gas and Electric Company ("PG&E"), the Joint Intervenors,^{1/} Governor Edmund G. Brown Jr., representing the Interested State of California, and the Nuclear Regulatory Commission Staff ("NRC Staff").

The January hearing culminated a prehearing process by which the Board accepted the following three issues for trial:^{2/}

^{1/} The Joint Intervenors include the San Luis Obispo Mothers for Peace, Scenic Shoreline Preservation Conference, Inc., Ecology Action Club, Sandra Silver, Gordon Silver, Elizabeth Apfelberg, and John J. Forster.

^{2/} The prehearing proceedings are described at pages 1-2 of PG&E's Proposed Findings of Fact and Conclusions of Law, dated February 25, 1982.



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(1) Whether onsite and offsite emergency planning and preparedness at Diablo Canyon satisfy NRC regulatory requirements, particularly 10 C.F.R. § 50.47;^{3/}

(2) Whether the pressurizer heaters at Diablo Canyon should be classified as components important to safety and be required to meet applicable requirements of 10 C.F.R. Part 50, Appendix A and Part 50, Appendix B; and

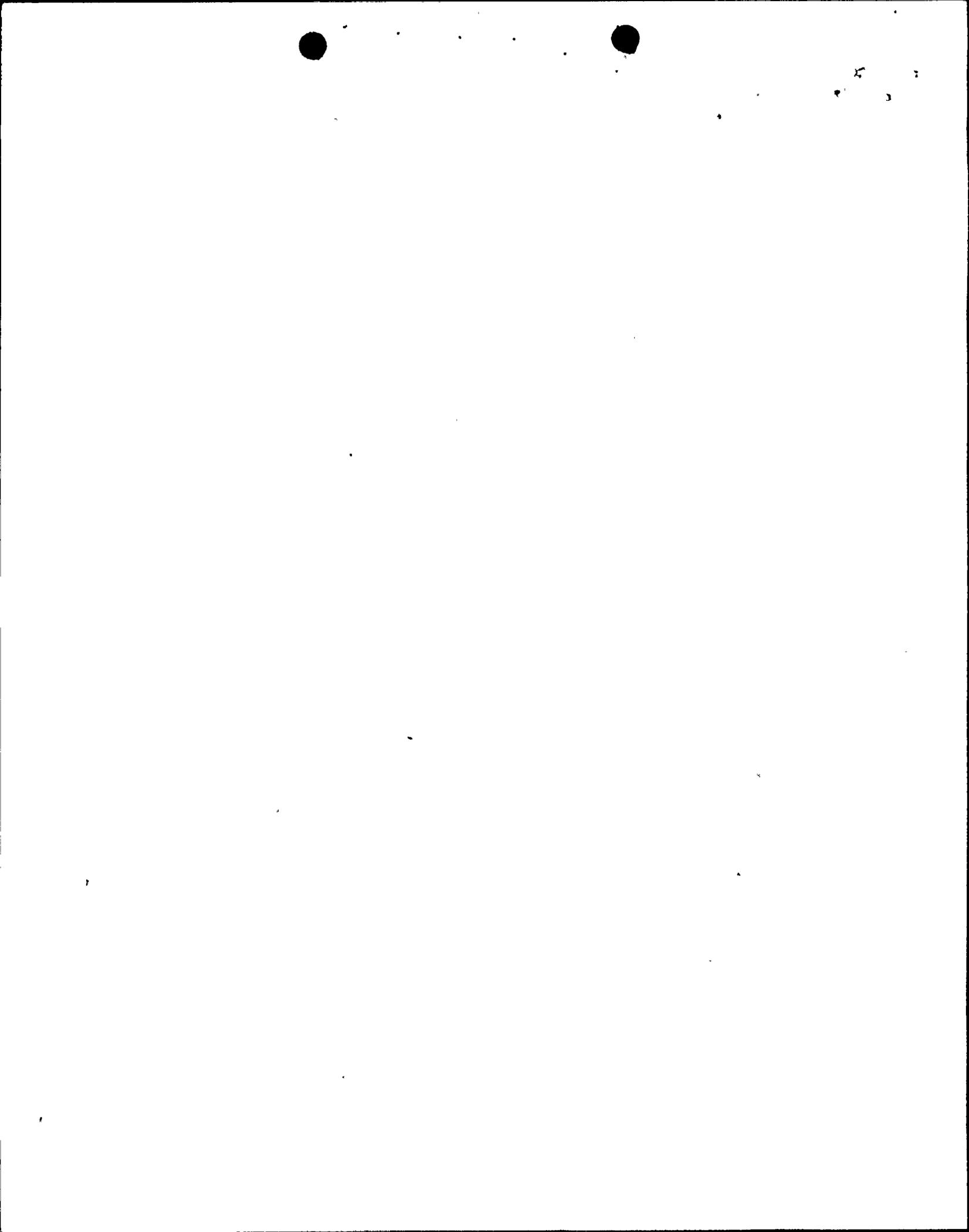
(3) Whether all power operated relief valves ("PORVs") at Diablo Canyon should be classified as components important to safety and required to meet all applicable safety grade criteria.

In accordance with this Board's Orders, Governor Brown hereby submits proposed Findings of Fact and Conclusions of Law on these issues.

Summary Discussion of Major Issues

The following is a summary discussion of the major issues before this Board. A detailed discussion of each issue is in the Findings and Conclusions portion of this Brief.

^{3/} Over objections of Governor Brown and Joint Intervenors, this Board ruled in its December 23, 1981, Prehearing Conference Order that the emergency planning contention excluded the complications to emergency response caused by an earthquake either initiating a Diablo Canyon emergency or occurring apart from such an emergency. The Governor's position remains that the Board erred in its ruling (see discussion at December 16, 1981 Prehearing Conference), because the NRC will not have the factual bases to make public health and safety findings without evaluating the impacts of an earthquake on evacuation routes, critical structures affecting emergency preparedness, and other aspects of the infrastructure necessary to maintain offsite emergency response capabilities.



A. Emergency Planning and Preparedness

The NRC, in 10 C.F.R. § 50.47 and in related guidance contained in NUREG-0654,^{4/} has specified that a high level of emergency planning and preparedness must be demonstrated before a new nuclear power reactor can be licensed to operate. Thus, in the Federal Register preamble which accompanied Section 50.47 on August 19, 1980, the NRC stated:

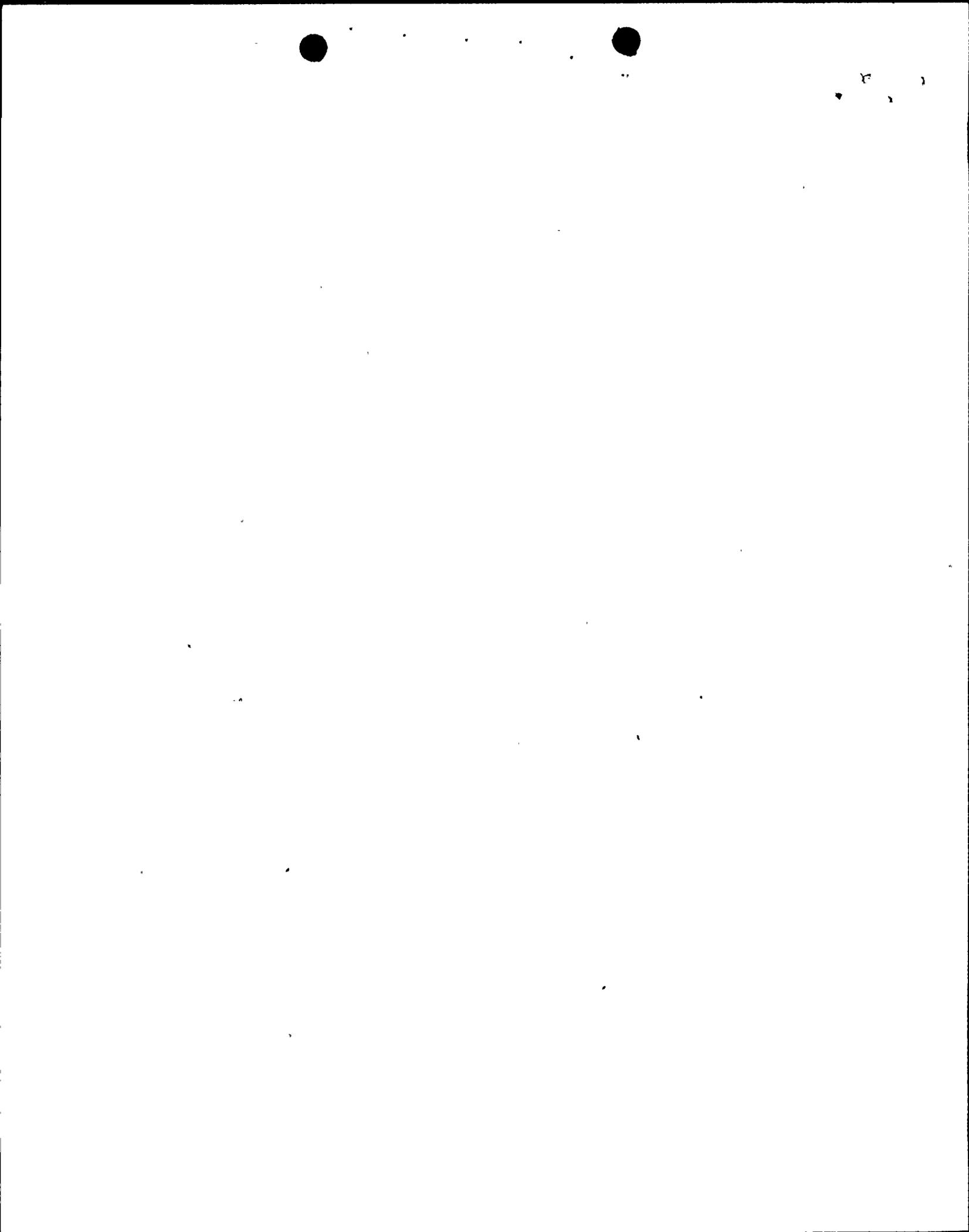
No new operating license will be granted unless the NRC can make a favorable finding that the integration of onsite and offsite emergency planning provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. 45 Fed. Reg. 55403 (1980) (emphasis supplied).

The regulation itself echoes this language:

No operating license for a nuclear power reactor will be issued unless a finding is made by NRC that the state of onsite and offsite emergency preparedness provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. 10 C.F.R. § 50.47(a)(1) (emphasis supplied).

In the instant contested proceeding, it is axiomatic that the "finding" required by Section 50.47(a)(1) -- the finding of adequate preparedness -- must be based on the evidence of record. The Governor submits, however, that such evidence is insufficient to demonstrate preparedness in several crucial respects, thus precluding this Board from finding that Section

^{4/} "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980.



50.47 is satisfied. The major areas of inadequate emergency preparedness are the following:

(1) Section 50.47(a)(2) makes a FEMA review and finding on the California State Emergency Response Plan a prerequisite to any Board decision on the adequacy of integrated emergency preparedness at Diablo Canyon. However, FEMA has made no finding regarding the adequacy of the State plan or whether that plan is capable of being implemented. Indeed, the evidence documents that FEMA has not even undertaken a review of the State plan. The absence of the necessary FEMA finding on the State plan thus creates an evidentiary void which must be corrected before the Board may even consider the adequacy of emergency planning at Diablo Canyon.

(2) The FEMA findings on the San Luis Obispo County Emergency Response Plan are fatally defective because they fail to address the current County plan and implementing procedures. Instead, the FEMA findings relate to the May 1981 Draft County Plan, a version which is now inoperative, out-of-date, and superseded by a significantly different October 1981 draft and implementing procedures. As a matter of law, therefore, FEMA's findings on the outdated County plan are largely immaterial to the issue before this Board and, thus, fail to meet the requirements of Section 50.47(a)(2).

(3) Planning Standard 50.47(b)(6) requires that adequate communications exist to support emergency response in the event of a Diablo Canyon emergency. The uncontradicted evidence of record establishes that there are severe deficiencies in San Luis

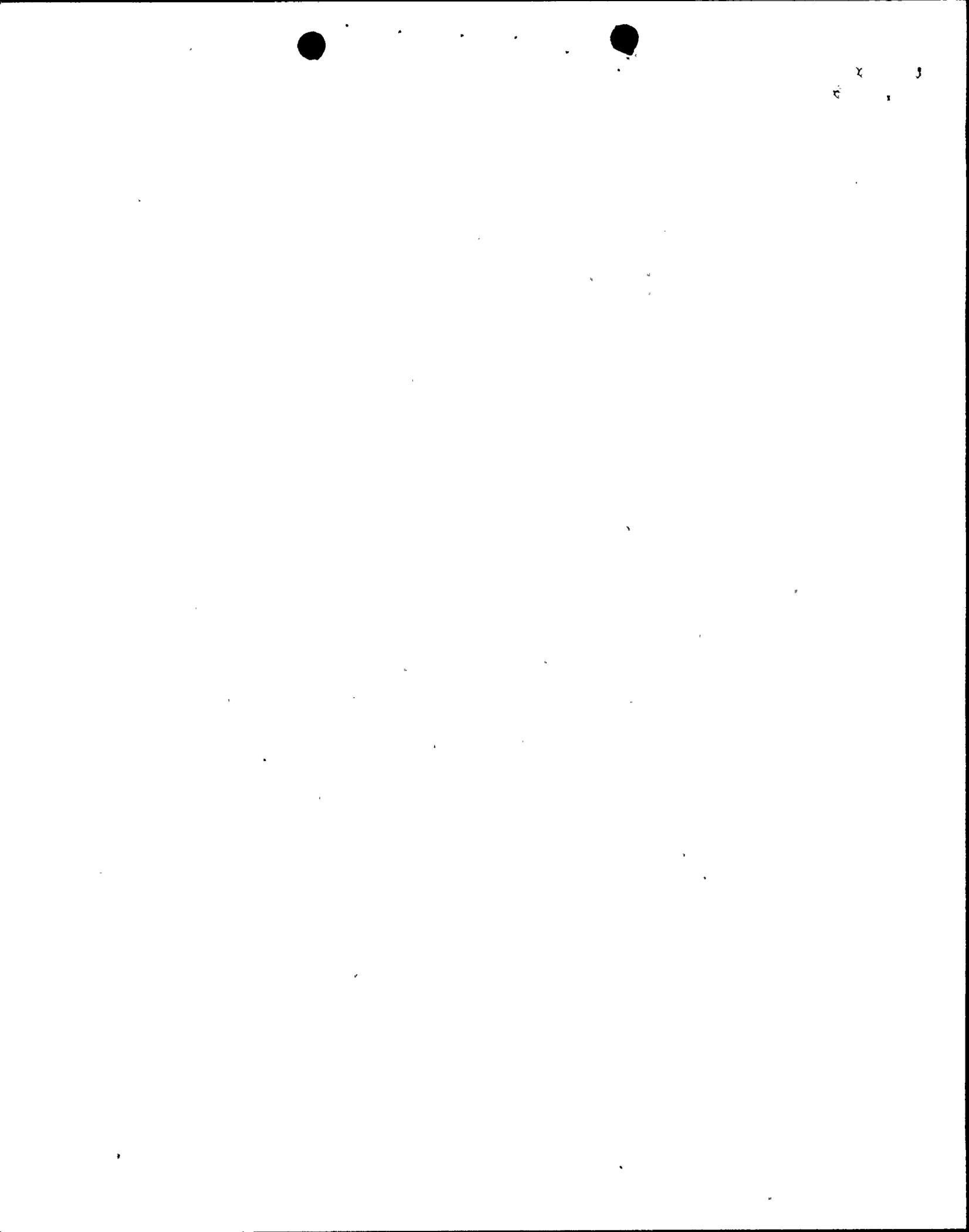


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Obispo County's radio communications network. For instance, the microwave system which forms the backbone of the County radio communications network does not even comply with FCC regulations. Further, limitations in radio coverage exist due to the County's rugged terrain. Unless the County system is improved, these limitations will preclude adequate emergency communications, particularly between the County Emergency Operations Facility ("EOF") and radiological monitoring teams. These deficiencies must be remedied before this Board can find compliance with Planning Standard 50.47(b)(6).

(4) Planning Standard 50.47(b)(7) requires that there be adequate public information and education programs in support of Diablo Canyon emergency preparedness. The evidence of record does not permit a finding that this standard is met. First, the County has not even begun to implement public information and education programs, and no evidence was presented to document the details of any program that the County intends to implement in the future.

Second, an adequate public information program cannot be designed and implemented unless a meaningful social survey is conducted to determine community attitudes and perceptions regarding response to a Diablo Canyon emergency, potential role conflicts for emergency workers, and the likely responses of segments of the population to emergency instructions after a Diablo Canyon accident. Such information is an essential ingredient for the planners who must prepare a workable public information program. Until such information is gathered and



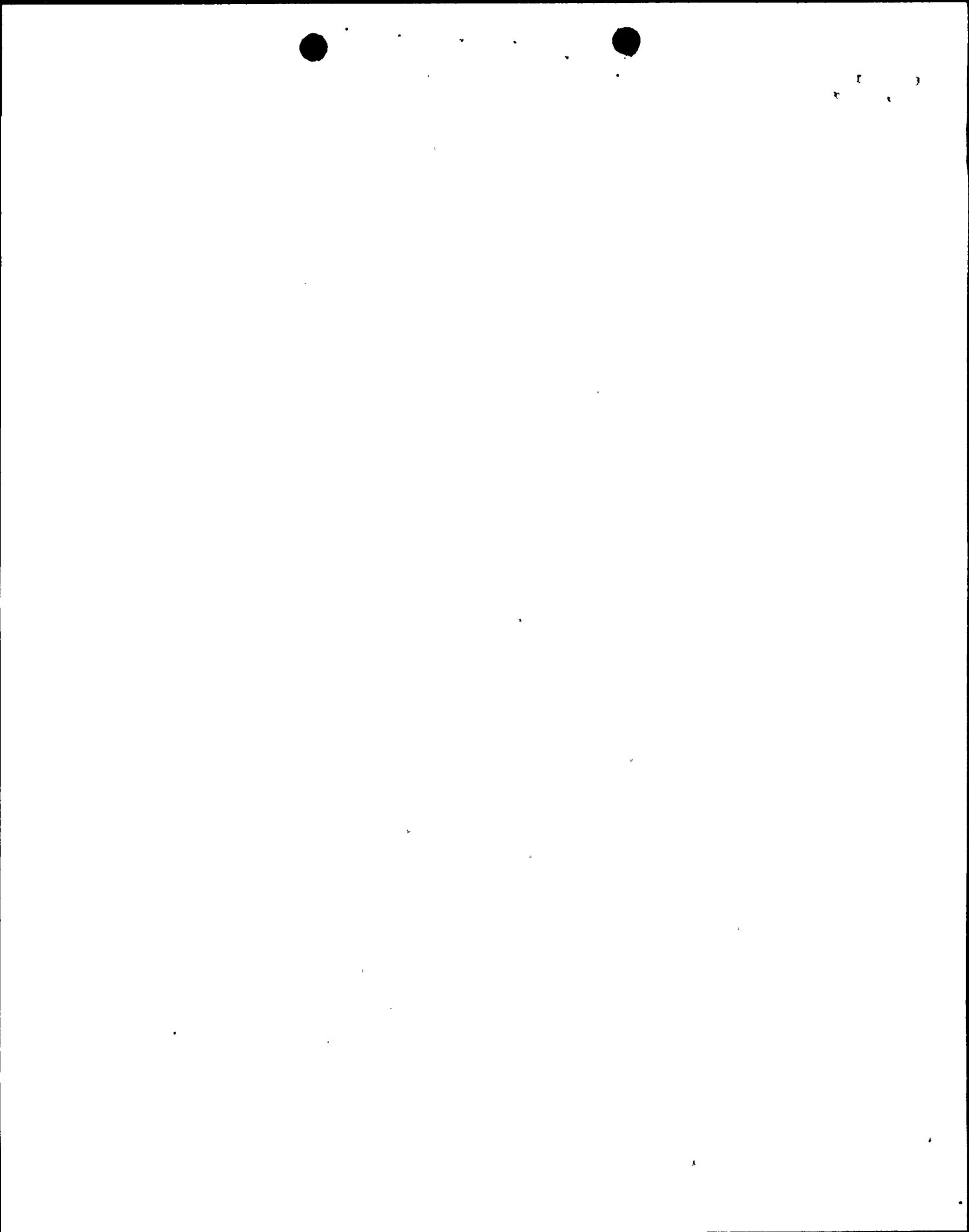
factored into emergency planning at Diablo Canyon, there is no basis for this Board to find that Planning Standard 50.47(b)(7) is satisfied. Accordingly, the Board should direct that the requisite social survey be conducted and used in the preparation of the County's public information program and emergency plan.

(5) Emergency preparedness and planning for Diablo Canyon fails to include Santa Barbara County, which is within the State of California's plume exposure emergency planning zone. The State has performed thorough analyses of potential accidents at Diablo Canyon and at other California power reactors. Based on these studies, the State has adopted offsite emergency planning zones for each reactor, including Diablo Canyon, that are keyed to site-specific characteristics.

Under the State emergency planning zone requirements, planning and preparedness for Diablo Canyon must extend into Santa Barbara County. However, Santa Barbara County has not completed its emergency plan and is not scheduled to do so until later in 1982. Until such plan is completed and capable of being implemented, this Board cannot find adequate offsite planning and preparedness or adequate integration of offsite and onsite emergency response capabilities.

B. Pressurizer Heaters and Power Operated Relief Valves

The pressurizer heaters at Diablo Canyon play a crucial role in maintenance of natural circulation. Indeed, Diablo Canyon operators are trained that this equipment is a primary means of pressure control to create conditions conducive to maintenance of natural circulation. Likewise, the PORVs at Diablo Canyon may

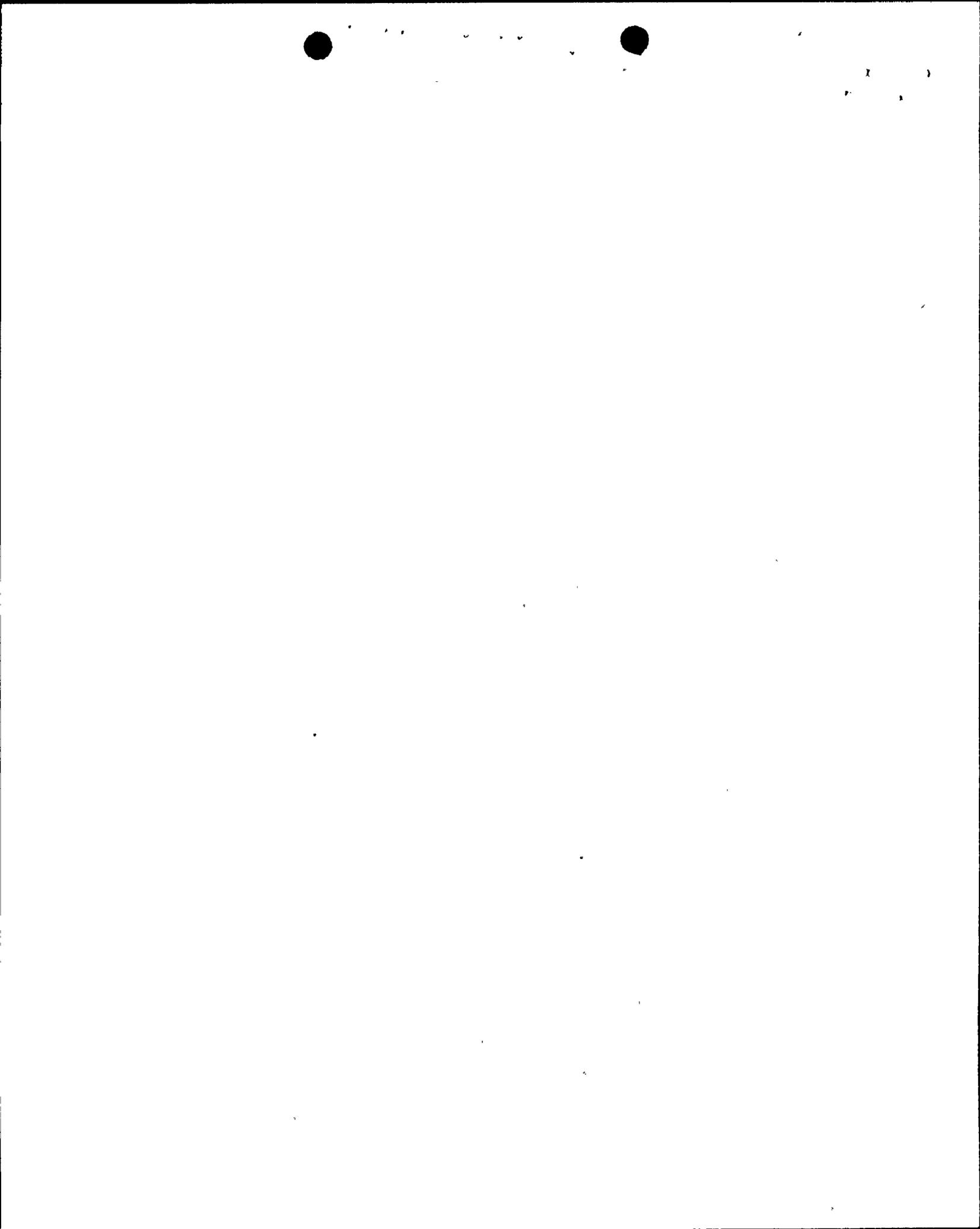


also be called upon to perform important safety functions, including reduction of challenges to the safety valves.

Notwithstanding the important functions of the pressurizer heaters and PORVs, the heaters and one PORV have not been classified as safety-related equipment. Accordingly, their reliability in transient and accident situations, when reliability is most important, has not been assured.

The evidence indicates that it is feasible to upgrade both the heaters and the PORV to safety grade. There would be no safety disadvantage to such action; rather, safety and reliability would clearly be improved. In view of the heavy reliance placed on this equipment by Diablo Canyon operators, the Board should order that the reliability of this equipment be upgraded.

Notwithstanding the foregoing, the Governor requests this Board to defer any ruling on pressurizer heaters and PORVs until the recently discovered major seismic error affecting such equipment is fully elucidated by PG&E. By letter dated February 24, 1982, PG&E informed the NRC that incorrect seismic response spectra were used above the 140' elevation where such equipment is located. The Staff informed the Board and parties of this significant error by Board Notification PNO-5-82-09. Pending further analysis by PG&E and the Staff of this serious design and quality assurance breakdown at Diablo Canyon, the Governor requests that this Board hold in abeyance consideration of all aspects of issues related to pressurizer heaters and PORVs.



FINDINGS AND CONCLUSIONS ON
CONTENTIONS 1, 10, AND 12

Contention 1: Emergency Planning and Preparedness

PG&E and the combined onsite, State and local emergency response plans and preparedness do not comply with 10 C.F.R. 50.33(g), 50.47 and revised Appendix E to Part 50.5/

I. THE FAILURE OF FEMA TO MAKE REQUIRED "FINDINGS" ON THE ADEQUACY OF THE STATE EMERGENCY RESPONSE PLAN PREVENTS THIS BOARD FROM MAKING A JUDGMENT ON THE ADEQUACY OF EMERGENCY PREPAREDNESS AT DIABLO CANYON

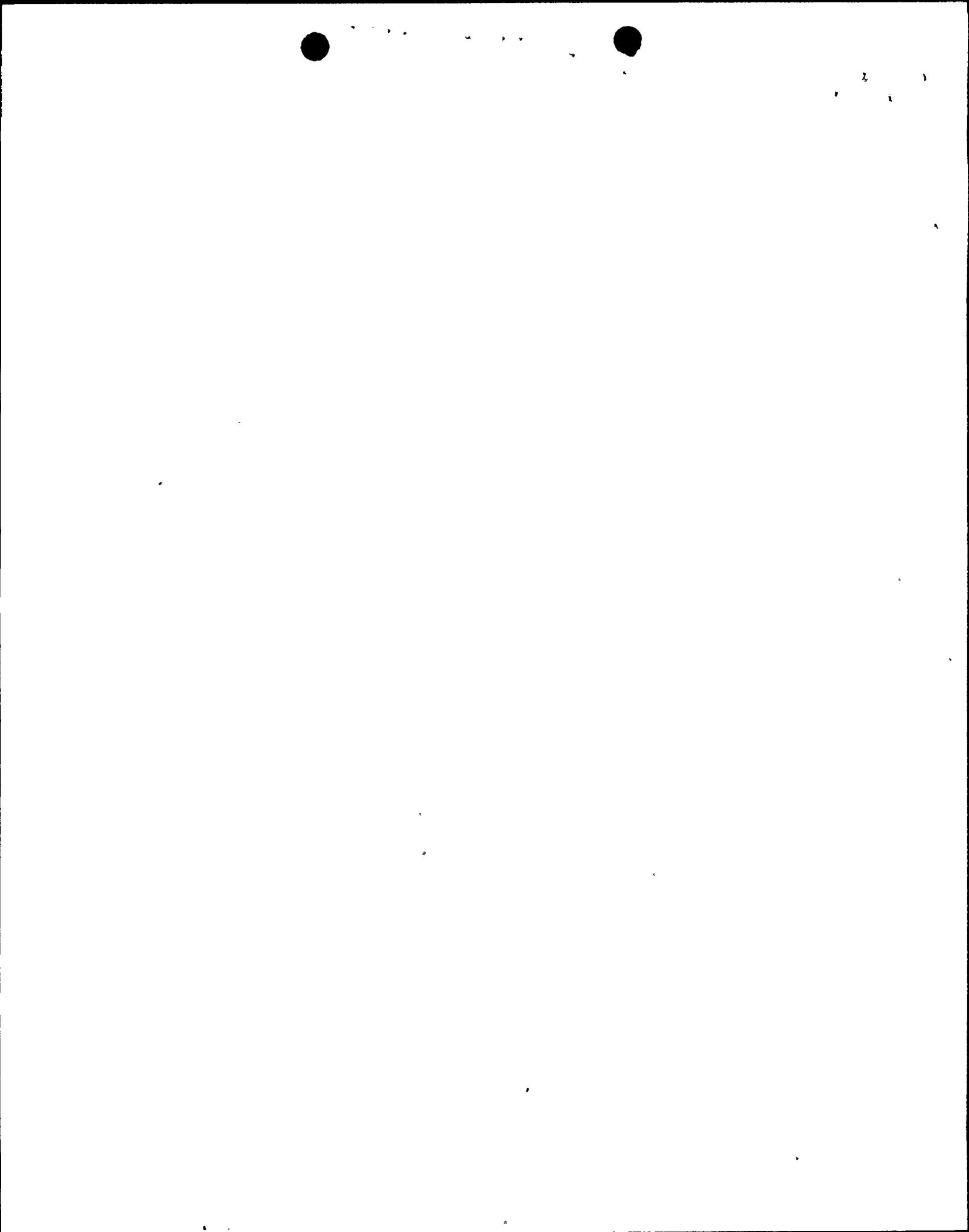
A. Findings of Fact

1. The State of California has prepared a Nuclear Power Plant Emergency Response Plan ("State Plan"), dated March 1981. PG&E Ex. 73, App. C. The State Plan is not yet complete. Tr. 12,708 (Eldridge); 12,003-005 (Skidmore).^{6/}

2. FEMA has not conducted a detailed review of the State Plan. Tr. 12,708 (Eldridge); Hubbard/Minor Test. at 10, foll. Tr. 12,313.

^{5/} Drs. William K. Brunot and Dennis S. Mileti; Ms. Kathleen M. Godfrey, Teresa A. Mack, and Faith J. Rockmaker; and Messrs. Donald J. Baxter, Jerome V. Boots, William B. Kaefer, William J. Keyworth, William S. MacElvaine, August J. Nevolo, John L. Potter, Douglas P. Serpa, James D. Shiffer, Steven M. Skidmore, Garrison P. Smith, Richard H. Thuillier and Reed H. Winslow presented evidence on behalf of PG&E. Messrs. Brian K. Grimes, Dean M. Kunihiro, John R. Sears, and Thomas Urbanik testified on behalf of the NRC staff. Drs. Kai T. Erikson, James H. Johnson, Sheldon C. Plotkin, and Messrs. Tim S. Ness and Miguel Pulido testified on the behalf of the Joint Intervenors. Messrs. Richard B. Hubbard, Gregory C. Minor and Dave L. Richter testified on behalf of Governor Brown.

^{6/} The State Plan includes implementing procedures, such as those of the California Department of Health Services (PG&E Exs. 82 & 82A) and of the California Office of Emergency Services. Tr. 12,771 (official notice of the OES procedures).



3. The November 2, 1981, FEMA "finding" does not even address the adequacy of the State Plan, much less evaluate the State Plan against the requirements of Section 50.47 or the detailed criteria of NUREG-0654. Thus, FEMA has issued no findings on the adequacy of the State Plan or whether it is capable of being implemented. Rather, FEMA's November 2 finding is directed only to the adequacy of the County Plan. Tr. 12,708, 12,710, 12,744 (Eldridge); see FEMA November 2 Finding, Attachment 2 to PG&E Testimony, foll. Tr. 11,782.

4. With respect to a potential Diablo Canyon emergency and the Section 50.47(b) Planning Standards, the State of California has primary responsibility for recovery and reentry and for ingestion pathway sampling. San Luis Obispo County has primary responsibility for emergency response in other areas. The State has back-up responsibility in areas where the County has the primary responsibility. Tr. 12,709-10 (Eldridge); 12,003 (Skidmore).

5. Section 50.47(a)(2) specifies that the NRC will base its conclusions regarding the adequacy of offsite preparedness "on a review of the Federal Emergency Management Agency [FEMA] findings and determinations as to whether State and local emergency plans are adequate and capable of being implemented . . ." (emphasis supplied).

6. The NRC, in the Supplementary Information published at the time Section 50.47 was adopted, elucidated FEMA's responsibility to review State emergency plans. Thus, FEMA is required:



1. To make findings and determinations as to whether State and local emergency plans are adequate.
2. To verify that State and local emergency plans are capable of being implemented (e.g., adequacy and maintenance of procedures, training, resources, staffing levels and qualification, and equipment).
3. To assume responsibility for emergency preparedness training of State and local officials.
4. To develop and issue an updated series of interagency assignments that delineate respective agency capabilities and responsibilities and define procedures for coordination and direction for emergency planning and response.

45 Fed. Reg. 55,406 (1980) (emphasis supplied).

7. The NRC Staff has specified that an NRC finding on overall emergency preparedness at Diablo Canyon would require a FEMA finding on the adequacy of State and local emergency plans. SER Supp. 14, p. 2-26; Hubbard/Minor Test. at 11, foll. Tr. 12,313.

8. Since FEMA has not made findings on the adequacy of the State Plan, the Board has insufficient data on which to judge (1) the adequacy of the State Plan or (2) whether the State Plan can be effectively implemented and integrated into the County and PG&E plans so as to ensure the level of emergency preparedness required by Section 50.47.

B. Discussion and Conclusions

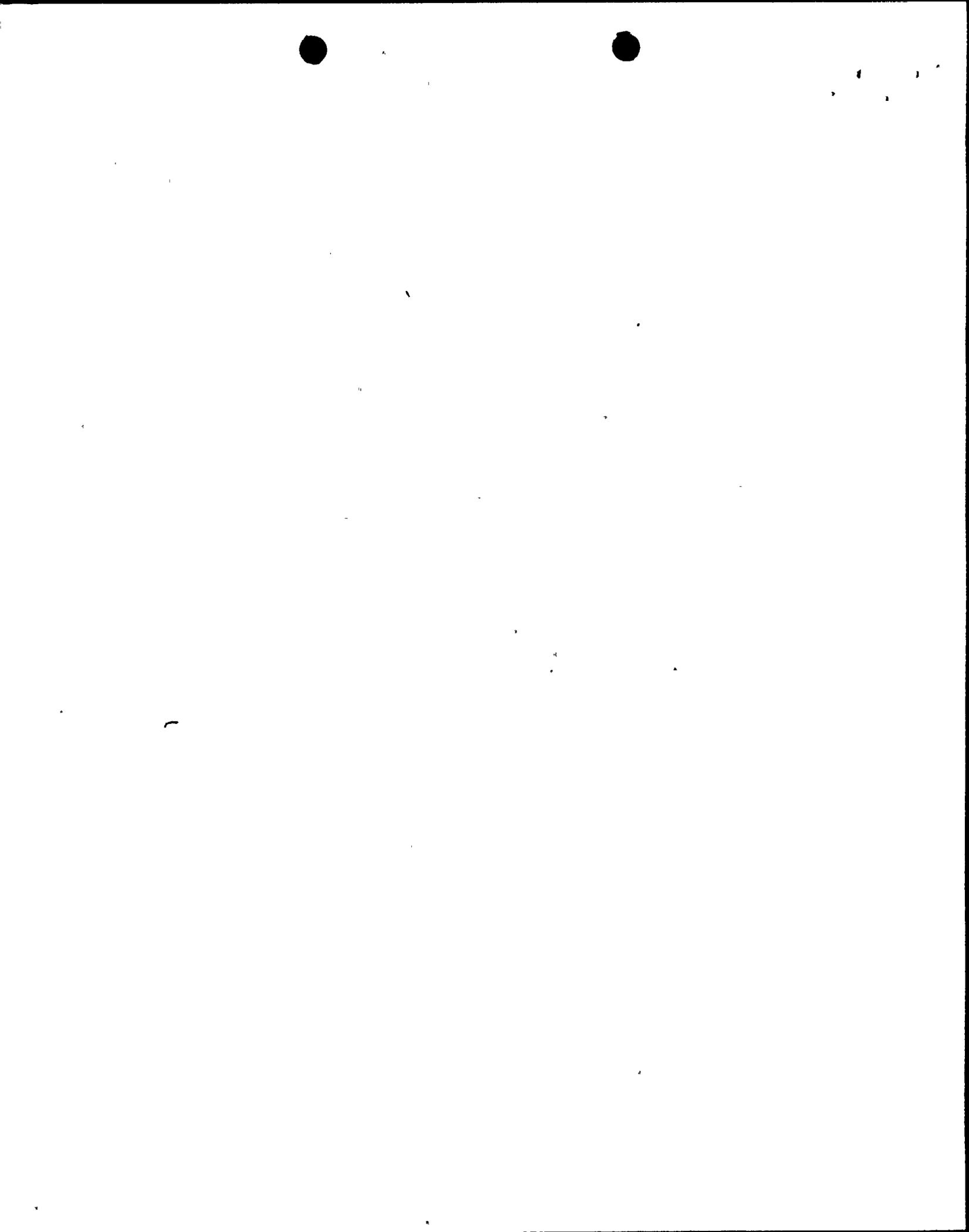
The record in this proceeding is fatally incomplete and does not permit this Board to rule on the adequacy of emergency preparedness because FEMA has failed to review and provide



findings on the adequacy of the State Plan and its integration into the County and PG&E plans. An express requirement of the NRC's regulations is that the NRC base its conclusions concerning the adequacy of integrated offsite preparedness, including offsite State preparedness, on the FEMA review of the State Plan. It is not acceptable to suggest, as Mr. Eldridge did in his testimony (Tr. 12,709), that a FEMA finding on the State Plan is unnecessary because the State Plan is essentially a backup plan with respect to most of the Section 50.47(b) Planning Standards. First, the State Plan is essential to integrated preparedness. The State has lead responsibility to implement certain Planning Standards and has critical support responsibilities in almost all other areas. See NUREG-0654 where the State has responsibilities under 117 review criteria. The importance of these overall responsibilities cannot be and has not been denied.

Second, Mr. Edlridge's statement is contrary to NRC regulations. His testimony that the State Plan can be ignored in the NRC's emergency planning review is an impermissible challenge to the regulations. The NRC, as provided in the emergency planning regulations, has determined that where local and State emergency response plans exist, there must be a finding by FEMA with regard to each plan.^{7/} Thus, the NRC regulations do not permit the

^{7/} During the December 16, 1981 Prehearing Conference the Governor's counsel pointed out FEMA's apparent failure to make necessary findings on the State Plan. Tr. 11,459-60. The Licensing Board ruled in its December 23, 1981, Prehearing Conference Order that the November 2 Finding was the finding called for under the NRC rules. At the January
(Continued)



licensing of a plant without a FEMA finding on the adequacy of the State Plan. This is not an empty requirement, but is obviously intended to ensure that the State's planning and preparedness responsibilities take cognizance of technical radiological data available to the NRC and of the responsibilities of federal and local agencies whose functions must work in tandem with the State's functions. To ensure this, the State is entitled to FEMA's review and, if justified, a finding that the State Plan is consistent with the federal standards established to ensure adequate emergency preparedness at Diablo Canyon. Other parties to the proceeding are also entitled to FEMA's review and finding on the State Plan, because such a finding constitutes a "rebuttable presumption" (see Section 50.47(a)(2)) which such parties have a right either to challenge or to rely upon.

A FEMA finding on the State Plan is most important for an additional reason. Following the serious shortcomings of emergency preparedness at TMI, the NRC mandated that:

No new operating license will be granted unless the NRC can make a favorable finding that the integration of onsite and offsite emergency planning provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

46 Fed. Reg. 55403 (1980) (emphasis supplied). Of course, there can be no finding of satisfactory "integration" of onsite and offsite preparedness where, as in this case, FEMA has not even

hearing, however, it became apparent that the FEMA finding clearly did not cover the State Plan. See findings of fact Nos. 2-3, supra.



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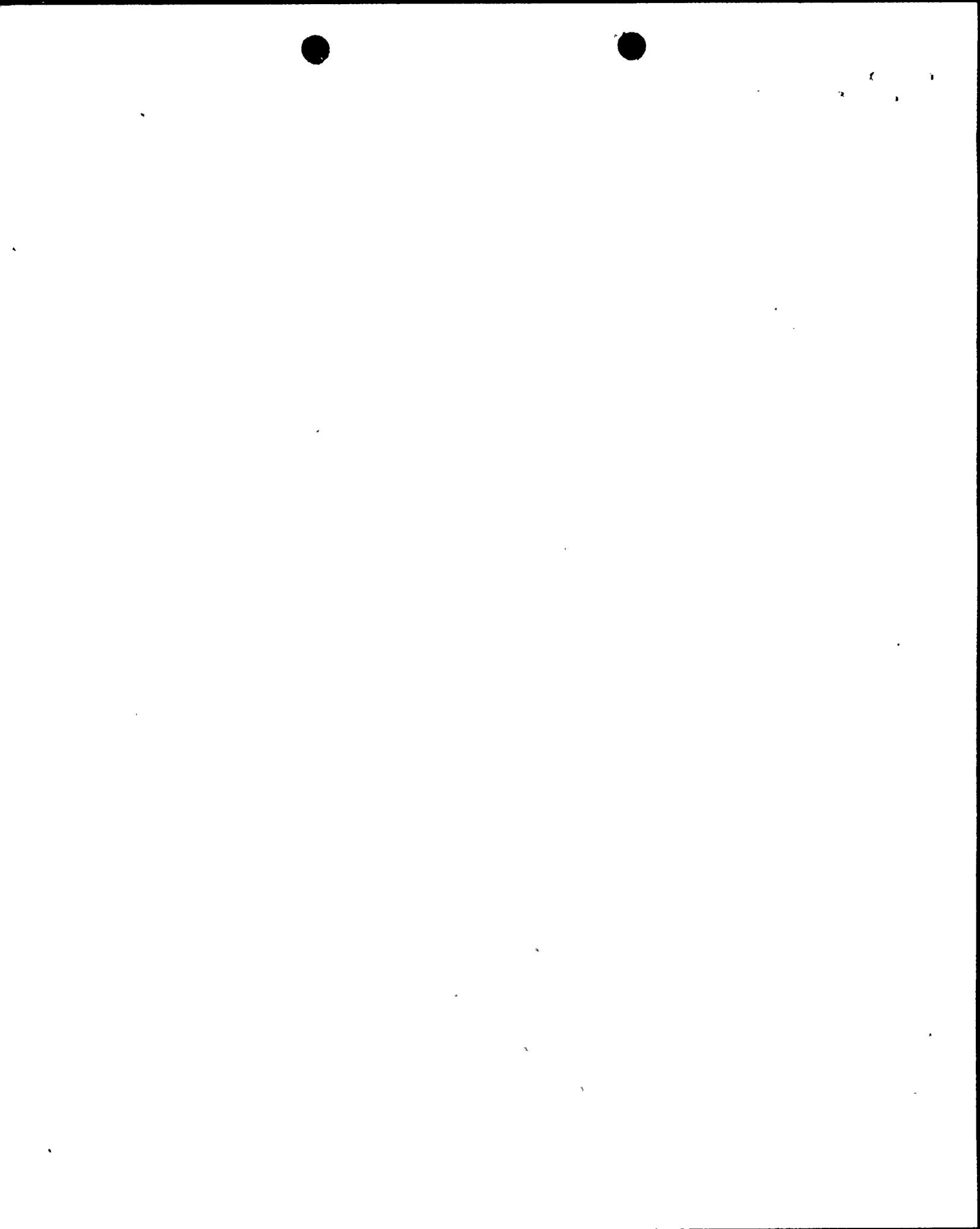
reviewed the State Plan against applicable regulatory requirements.

Accordingly, this Board must rule that insofar as offsite emergency preparedness is concerned: (1) the Board does not have the evidence of record on which to make a judgment on the adequacy of the State Plan or on whether there is necessary integration of the State, County, and PG&E plans; and (2) the Board will await the necessary FEMA review and findings on the adequacy and integration of the State Plan before making its Findings of Fact and Conclusions of Law on the sufficiency of offsite planning and preparedness. When FEMA's findings are forthcoming, this Board should then provide participants in this proceeding an opportunity to review those findings, and, if appropriate, to present evidence or pursue cross-examination to test the validity of those findings.

II. THE FEMA FINDINGS ON THE ADEQUACY OF THE SAN LUIS OBISPO COUNTY EMERGENCY RESPONSE PLAN ARE INADEQUATE AS A MATTER OF LAW.

A. Findings of Fact

1. In May 1981, San Luis Obispo County prepared a draft Emergency Response Plan ("May Draft"). PG&E Ex. 73, App. B.
2. In June 1981, FEMA reviewed the May Draft against the Section 50.47(b) Planning Standards and the NUREG-0654 guidance. Joint Int. Ex. 125. FEMA found the May Draft unsatisfactory when measured against the regulatory requirements of Section 50.47 and NUREG-0654. Indeed, the May Draft was not even complete, since the standard operating procedures ("SOPs") which constitute a necessary portion of the County plan had not even



been drafted. Accordingly, FEMA specified many areas in the May Draft which needed improvement, including wholesale revision of the May Draft and preparation of SOPs necessary to implement the County Plan. Id.

3. During the Summer and early Fall 1981, the County revised the May Draft and prepared many of the necessary SOPs. In October 1981, the County issued Revision B to the County Emergency Plan ("October Draft"). PG&E Ex. 80. The October Draft differs substantially from the May Draft which had been found to be inadequate. Compare Ex. 80 with PG&E Ex. 73, App. B. Thus, the May Draft was superseded and was no longer deemed a viable plan under which the County would act.^{8/} By October 1981, the County also had prepared many SOPs, at least in draft form, which were designed to implement the October Draft.

4. FEMA's findings on the adequacy of the County plan were issued November 2, 1981. Attachment 2 to PG&E Testimony, Tr. foll. 11,782.

5. FEMA's Findings are based on a review of the inoperable and outdated May Draft, as well as on the results of the August 19 exercise. FEMA's Findings are not based upon a review of the more current October Draft or upon a review of any SOPs. Eldridge test. at 2, foll. Tr. 12,688. Indeed, there is no evidence setting forth the necessary FEMA findings on the

^{8/} The fact that the May Draft was totally discarded is emphasized by the actions of the County in January 1982 which specified that the October Draft, not the May draft, would be conceptually adopted to permit the planning process to proceed. Tr. 12,239, 12,249-50 (MacElvaine).



adequacy of the October Draft or any FEMA review of the October Draft against the Section 50.47 Planning Standards or the criteria of NUREG-0654.

6. FEMA intends to review the October Draft, as subsequently revised, when it is completed and finally adopted by the County. Tr. 12,706-07 (Eldridge).

B. Discussion and Conclusions

Under Section 50.47(a)(2), FEMA must make "findings and determinations" as to whether the San Luis Obispo County Plan -- i.e., the October Draft -- is adequate and capable of being implemented. FEMA has not met this responsibility. Rather, FEMA has made its "findings" on an incomplete plan -- the May Draft -- which the County is not planning to use. Thus, FEMA's findings are in fact no findings at all regarding the adequacy of the County plan and the SOPs the County intends to use in the event of a radiological emergency at Diablo Canyon.

The inadequacy of the FEMA findings is highlighted by the type of review that FEMA used in making its November 2 findings. The review did not compare the County Plan against the Planning Standards of Section 50.47(b) or against the NUREG-0654 criteria. Rather, the review merely listed a number of deficiencies which needed to be corrected. However, there is no assurance that those are the only deficiencies in the current County Plan, because FEMA did not review either the October Draft or the



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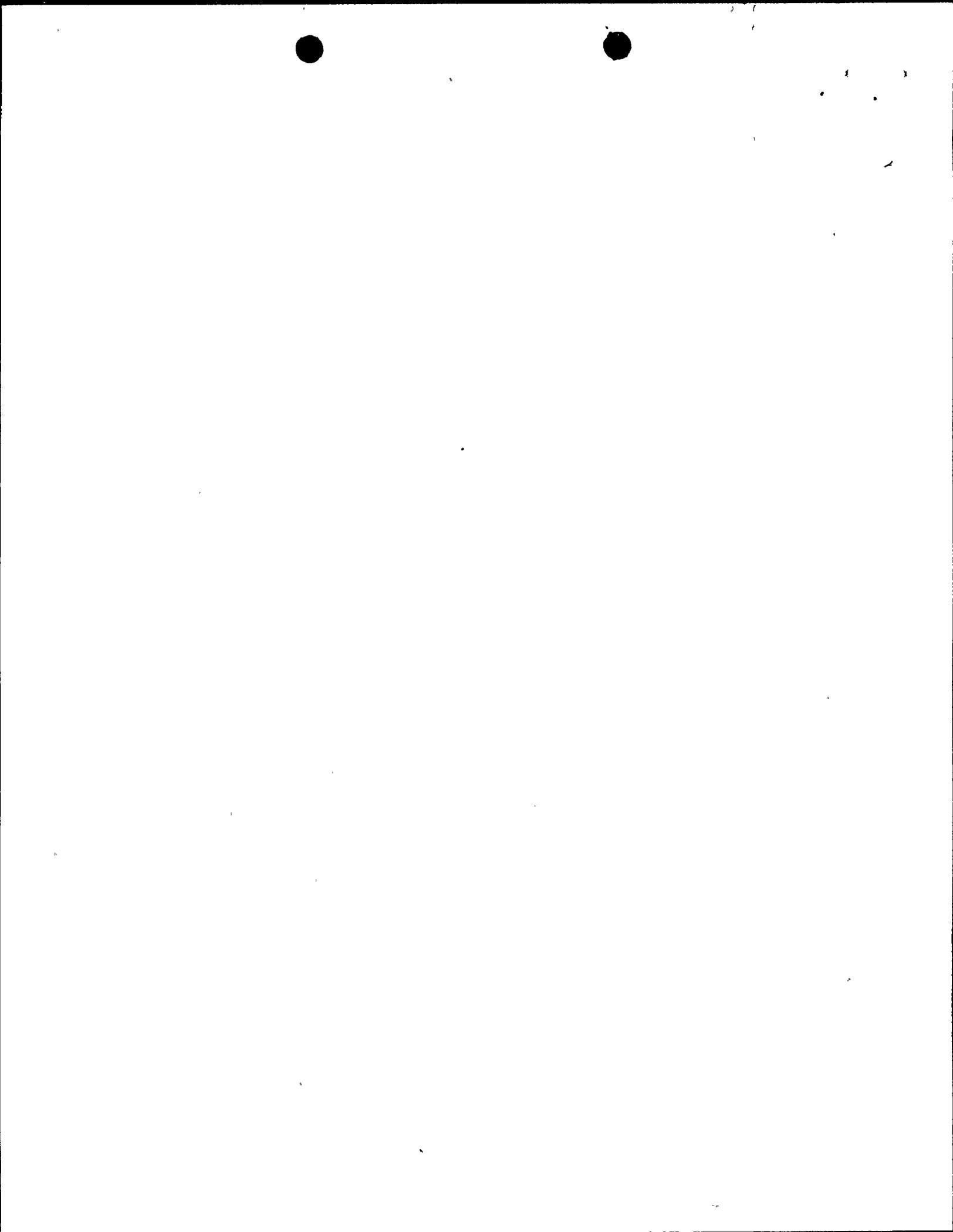
County SOPs which were offered into evidence at the trial as, together, constituting the County Plan.^{9/}

In addition, given FEMA's failure to review the current operative draft County Plan, there can be no confidence in the FEMA schedule for completion of the corrective actions specified in the November 2 "finding." The FEMA schedule (Staff Ex. 35) concerns only corrective actions relating to the May Draft and, accordingly, cannot be viewed as an accurate prediction of the time necessary to correct deficiencies in a plan which FEMA had not even evaluated.

The parties to this proceeding and the Board are entitled to FEMA findings on the version of the County Plan which is intended to be used during operation of the Diablo Canyon plant, i.e., the October Draft.^{10/} Since such findings have not been prepared, there is no basis for FEMA to find that the County Plan is adequate. Accordingly, this Board should rule that the FEMA findings are not acceptable under the NRC's regulations. The Board's Initial Decision should be withheld until the proper FEMA review is performed, requisite findings are made, and the

^{9/} The SOPs are part of the County Plan but are too voluminous to be bound as an integral part of the plan. They were marked separately as PG&E Exs. 81 and 81A but actually constitute Part III of the October draft of the County Plan which is PG&E Ex. 80.

^{10/} The Governor, of course, does not suggest that FEMA's findings, to be adequate, would necessarily need to address each subsequent change in the operative County Plan. However, where, as at Diablo Canyon, there has been a complete revision of the plan, FEMA's findings must concern the operative version of the plan.



parties are given an opportunity to present their views on the resulting "rebuttal presumption."

III. PG&E'S EMERGENCY OPERATING PROCEDURES ARE INADEQUATE

A. Findings of Fact

1. The Emergency Operating Procedures ("EOPs") for operators at Diablo Canyon are set forth in PG&E Ex. 74 and are specifically referred to in Appendix F to the PG&E Emergency Plan as procedures which implement the PG&E Plan. PG&E Ex. 73, Appendix F. These EOPs must be submitted to the NRC. 10 C.F.R. Part 50, Appendix E.

2. PG&E has acknowledged that it is important for operators to know the reliability of the equipment specified for use in the EOPs.

PG&E has conducted a review of its revised and expanded Emergency Operating Procedures to identify all of the equipment included in the procedures PG&E is in the process of ensuring that its operators are aware of which instruments mentioned in its revised and expanded Emergency Operating Procedures (other than primary instruments) may not be available due to lack of qualification.

See Hubbard/Minor Test. at 15-16, foll. Tr. 12,313, quoting Rev. 1 to PG&E's Environmental Qualification Report, Sept. 1981, p. III-2.

3. Planning Standard 50.47(b)(9) specifies the need for "[a]dequate methods; systems and equipment for assessing and monitoring actual potential offsite concentrations of a radiological emergency condition" In NUREG-0654, Accident Assessment, Evaluation Criterion 1, the licensee is directed to



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set forth in the facility's EOPs "the kinds of instruments being used and their capability." (emphasis supplied).

4. The current PG&E EOPs are inadequate because they do not provide Diablo Canyon operators with information describing the capabilities or qualification status of the equipment. Such data would alert the operators to the likely reliability of the equipment. Moreover, the equipment itself is not even labeled with its qualification status. Accordingly, during an emergency an operator is instructed to rely on equipment which may not be available, but the operator is nowhere specifically instructed in the EOPs as to the possible unavailability of such equipment due to its qualification status. Hubbard/Minor Test. at 16, foll. Tr. 12,313.

5. The EOPs should clearly identify which equipment is safety-related and which is not to ensure that operators are alerted to the possible unavailability of equipment they might otherwise rely upon. A better solution would be to qualify the non-safety related equipment which is relied upon in the EOPs. If this were done, there would be no need to identify the reliability status of equipment separately in the EOPs, because all equipment relied upon in the EOPs would be qualified to the same high standard. At a minimum, however, it is important for reactor operators to be aware of the qualification status of equipment so that they will be alert to possible unavailability of particular equipment which is not qualified for the accident conditions that may be experienced. Tr. 12,320-24 (Hubbard).



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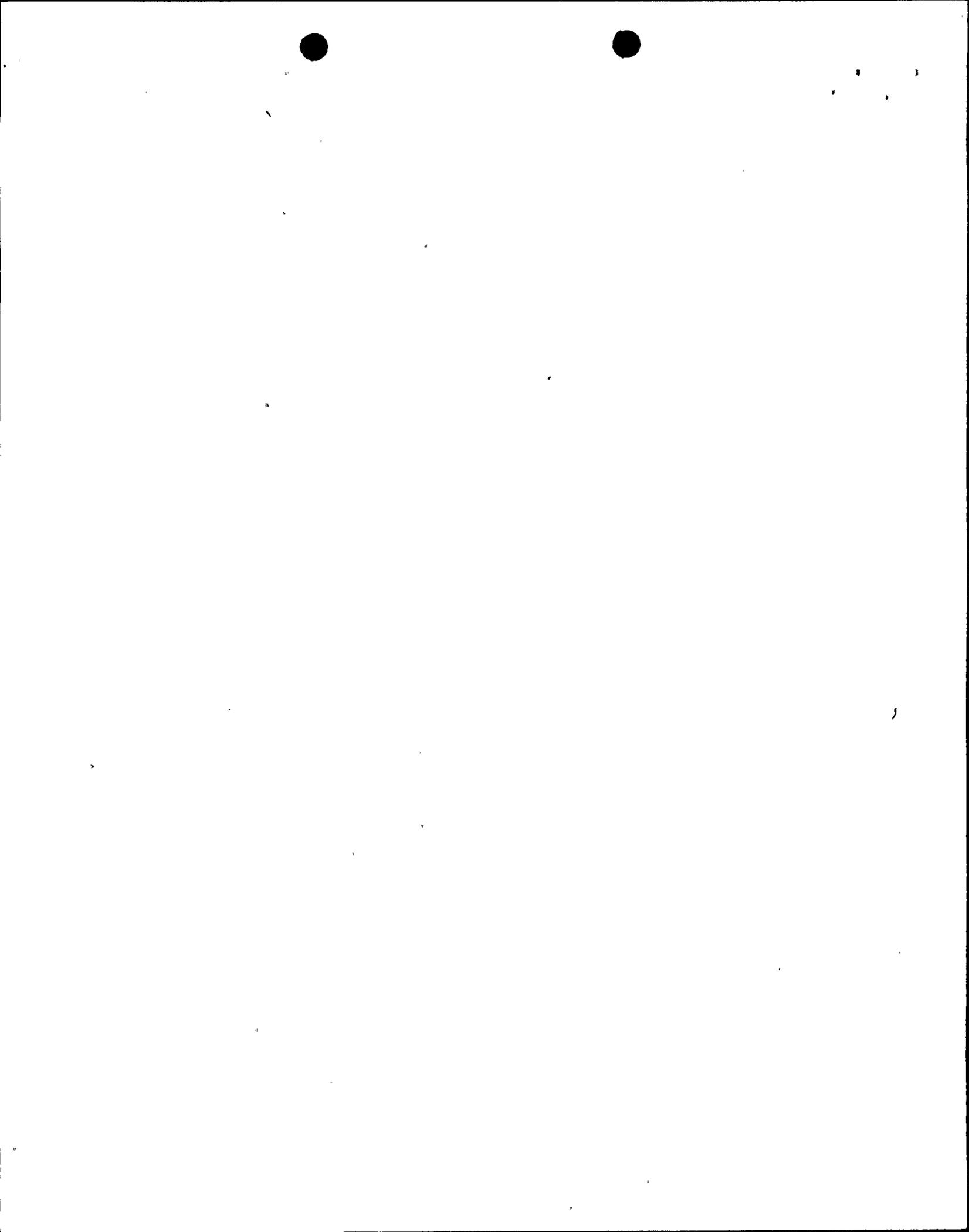
6. PG&E has acknowledged that there is a need for operators to be made aware of the qualification status of the equipment which is relied upon in the EOPs. See finding 2, above. However, there is no evidence documenting how PG&E is ensuring that its operators are aware of the qualification status of the equipment mentioned in the EOPs.

B. Discussion and Conclusions

A review of the PG&E EOPs demonstrates that PG&E has not complied with Planning Standard 50.47(b)(9) or NUREG-0654, accident Assessment Evaluation Criterion 1.^{11/}

11/ The Governor requests the Board to take official notice of the Staff's SER in the TMI restart proceeding, where the Staff supported the need to identify the qualification status of equipment relied upon in an emergency. See March 31, 1981 TMI SER on Environmental Qualification of Safety-Related Electrical Equipment, which states:

A complete list of all display instrumentation mentioned in the LOCA and HELB emergency procedures must be provided. Equipment qualification information in the form of summary sheets should be provided for all components of the display instrumentation exposed to harsh environments. Instrumentation which is not considered to be safety related but which is mentioned in the emergency procedure should appear on the list. For these instruments, (1) justification should be provided for not considering the instrument safety related and (2) assurance should be provided that its subsequent failure will not mislead the operator or adversely affect the mitigation of the consequences of the accident. The environmental qualification of post-accident sampling and monitoring and radiation monitoring equipment is closely related to the review of the TMI Lessons-Learned modifications and will be performed in conjunction with that review.



The specific deficiencies are:

--PG&E has failed to describe in the EOPs the capabilities of the equipment relied upon in the EOPs;

--PG&E has failed to demonstrate how operators will be made aware of the capabilities and qualification status of equipment relied upon in the EOPs.

Accordingly, this Board should rule that PG&E has not complied with Planning Standard 50.47(b)(9).

IV. PG&E HAS NOT DEMONSTRATED THAT IT WILL PROVIDE ADEQUATE POST-ACCIDENT MONITORING EQUIPMENT

A. Finding of Fact

1. Planning Standard 50.47(b)(9) requires that there be adequate methods, systems and equipment for monitoring the actual and potential offsite consequences of a radiological emergency.

2. In NUREG-0737, Item II.F.1, the NRC provided information concerning additional post-accident monitoring instrumentation which must be implemented to satisfy existing regulatory requirements.

3. Related to the NUREG-0737 requirement and to compliance with Section 50.47(b)(9), Item II.C(7) of the Diablo Canyon Low Power Operating License required PG&E to submit a proposal for compliance with Revision 2 of Regulatory Guide 1.97, pertaining to instrumentation necessary to assess plant conditions immediately following an accident.

4. On October 22, 1981, PG&E submitted a letter in response to Item II.C(7) of the Diablo Canyon Low Power License. Hubbard/Minor Test. at 17, foll. Tr. 12,313.



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5. The PG&E review of its compliance with Revision 2 of Regulatory Guide 1.97 indicated that nearly one-third of the variables listed in the Regulatory Guide -- 21 out of 69 items -- require work to bring the PG&E equipment into compliance with that Guide. Id. According to PG&E, the required work is as follows:

(a) 11 variables require qualification of the existing equipment;

(b) 4 variables require changing the ranges;

(c) 1 variable requires upgrading the indication loops; and

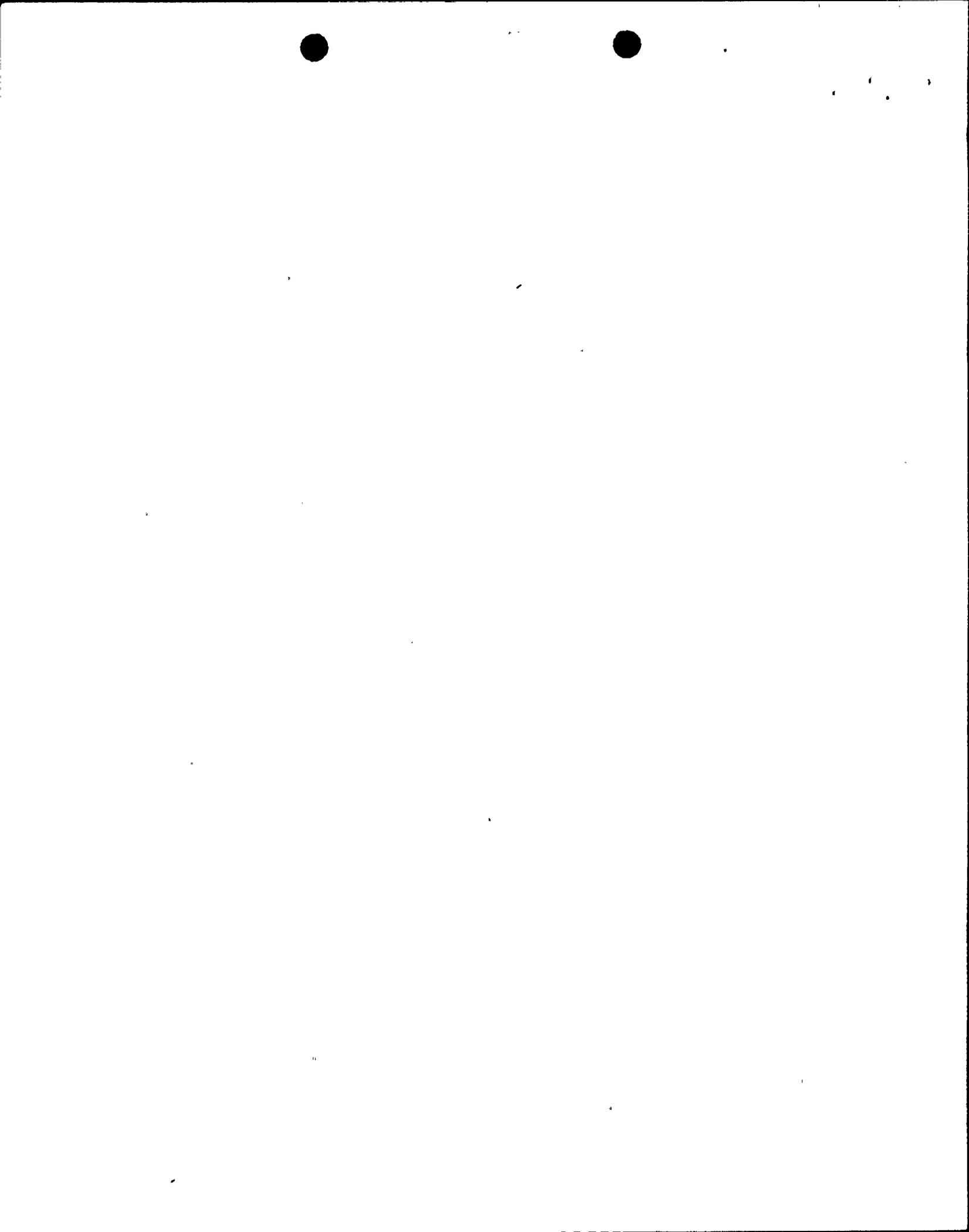
(d) 5 variables require new indication loops, such as loops to monitor radioactivity concentration on radiation levels in the primary coolant and radiation rates in the buildings or areas. Id.

6. PG&E has committed to complete work to bring its equipment into compliance with Regulatory Guide 1.97 prior to June 1983. Id. at 17-18.

7. PG&E's October 22, 1981, submittal is cursory and conclusory, providing no details of how PG&E intends to comply with Regulatory Guide 1.97 by June 1983 or, in fact, by any other date. Id. at 18.

B. Discussion and Conclusions

PG&E is not required to demonstrate that it currently is in full compliance with Regulatory Guide 1.97. However, for this Board to have reasonable assurance that PG&E can and will meet the June 1983 commitment, PG&E was required to present



evidence that it can and will correct the deficiencies in accordance with its October 22 commitment.

There is no evidence to support a conclusion that PG&E will in fact meet the June 1983 commitment date. This Board must therefore rule that there is no demonstration that PG&E will meet the requirements of Planning Standard 50.47(b)(9).

V. THE SAN LUIS OBISPO COUNTY RADIO COMMUNICATIONS SYSTEM IS NOT ADEQUATE

A. Findings of Fact

1. In June 1981, FEMA reviewed the May Draft of the San Luis Obispo County Emergency Plan. Joint Int. Ex. 125. One recommendation of that review was for the County to "develop a communications plan that describes the communications equipment, interconnection, and the need in the County." Id.

2. The County subsequently completed a detailed analysis of its communications capabilities and needs. The analysis is contained in two documents: the November 1981 "Evaluation of the San Luis Obispo County Public Safety Communications System," prepared by PRC Voorhees (Gov. Brown Ex. 9), and the "County of San Luis Obispo Department of Technical Services Five Year Communications Plan," dated January 1982 (Gov. Brown Ex. 10).

3. The County's analysis of its own communications system reaches the following conclusion: the County's communications system is inadequate and needs immediate upgrading if it is to perform adequately in support of the County's Nuclear Power Plant Emergency Response Plan. The bases for these County conclusions are described in succeeding findings.



4. The County radio system has been generally described as follows:

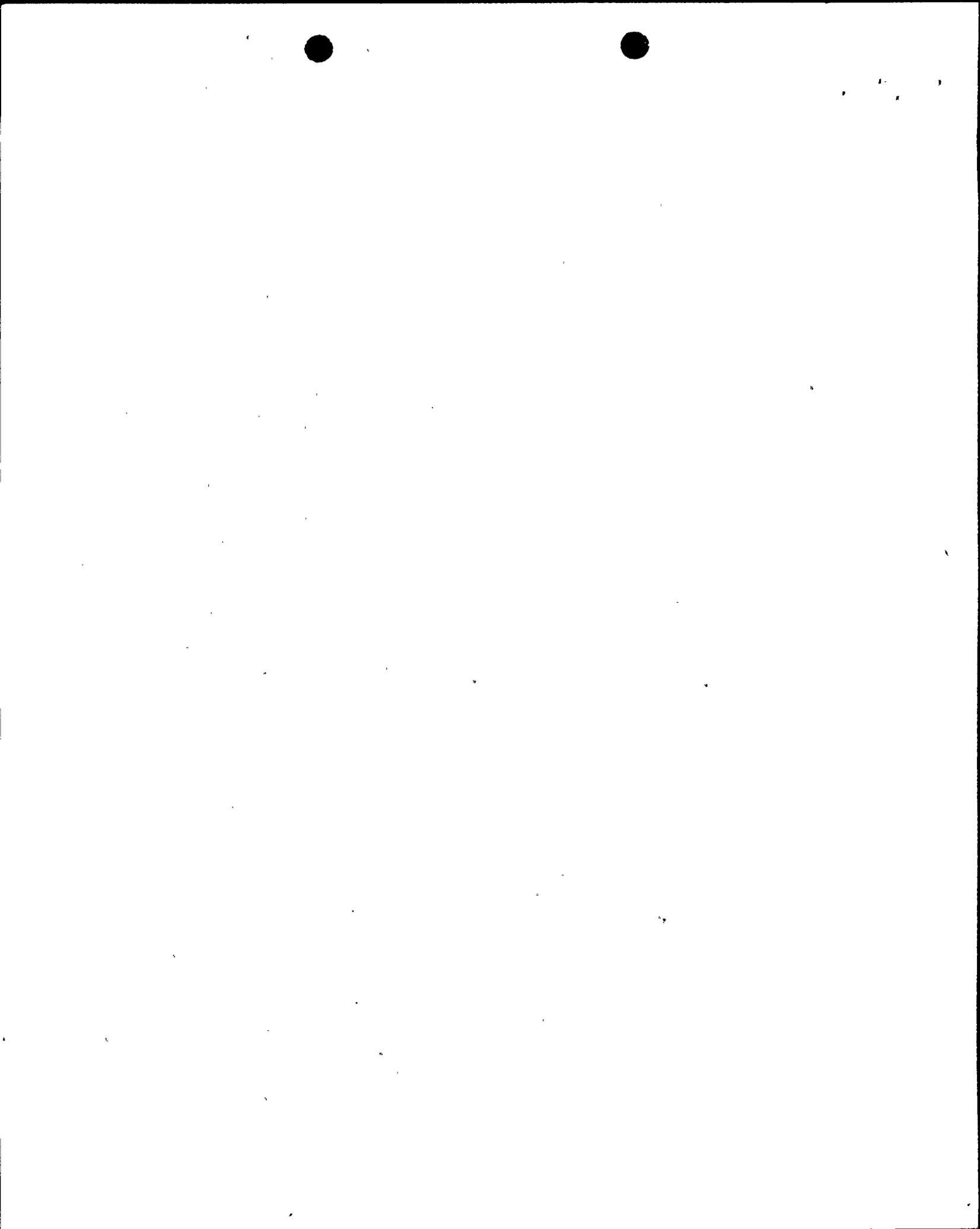
The County radio system consists of a series of mountaintop repeaters linked together by a microwave backbone, which has a terminus at the radio shop near the Sheriff's Office. From that point, land lines tie the Sheriff's dispatch console, the San Luis Obispo California Highway Patrol dispatch desk and the California Department of Forestry (County Fire Department) command center into the system. The microwave links the following points: "Northward" from the radio shop -- to Cuesta, Rocky Butte and hence to Black Mountain; "southward" from the radio shop -- to Davis Peak (via passive reflector), hence to Tepesquet Peak (where a tie-in exists to the Santa Barbara County Sheriff's Office). The frequency channels supported by the microwave include:

- Sheriff's Office VHF channels "(3): - "Red", "Blue", "Yellow"
- County Local Government VHF channel: "Green"
- Animal Control UHF channel:
- County UHF Mutual Aid Fire Frequency
- County UHF Medcom channels; (4).

Gov. Brown Ex. 9, at 3-4.

5. Under the County Emergency Plan, the Sheriff, Fire, and Medical frequencies are reserved for those agencies which already regularly use these frequencies. The UHF Animal Control frequency and the VHF local government frequencies, however, would be available for message traffic directly related to responding to a Diablo Canyon emergency. Thus, the County Plan

envisions the usage of the Animal Control frequency for nearly exclusive use to conduct field operations in radiation monitoring, with the single exception of providing a backup radio link with the EBS stations. The local government (VHF) frequency is expected to be used for paging,



activating tone-alert monitor radios, and siren system activation

Gov. Brown Ex. 10, at 4.

6. San Luis Obispo County communications are significantly affected by the rugged terrain in San Luis Obispo County. The hills within the County act as barriers to radio communications and thus require that a series of radio sites with associated equipment be located around the county to ensure complete communications coverage. Gov. Brown Ex. 10, at 1.

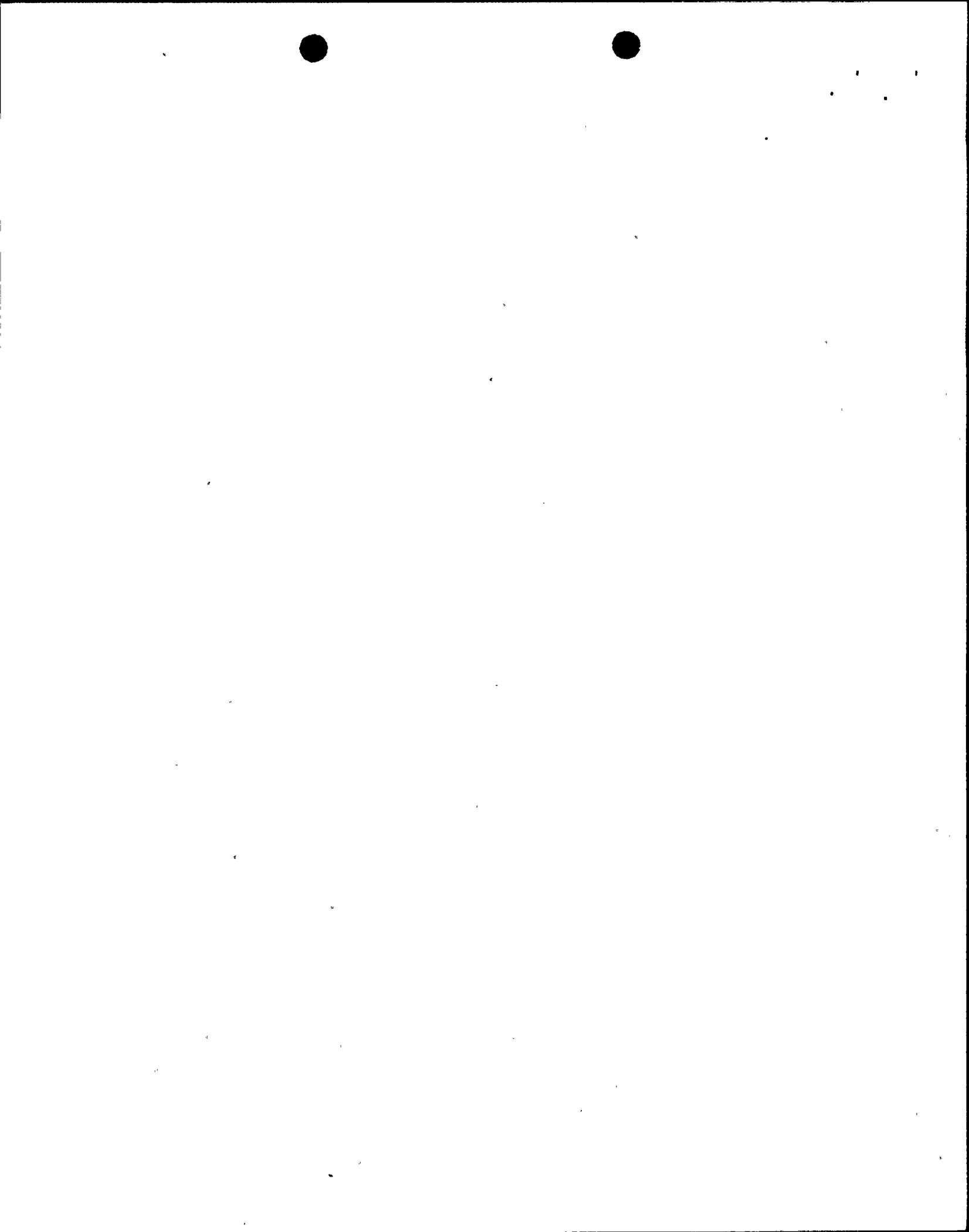
7. The backbone of the County communications network is the microwave system. The microwave system carries radio messages from the microwave vault at the Sheriff's station to the sites of various mountains throughout the County. From these mountaintops, the messages are passed to normal radio transmitters for broadcasting. Id. at 4-5.

8. The County microwave system, by the County's own admission, is severely inadequate. Thus, the County Department of Technical Services stated in January 1982:

Problems exist in several areas: a lack of test equipment for use in calibrating and aligning the microwave system, an inadequate microwave vault at the Sheriff's Department, a lack of channel capacity for expansion of the system, a need for additional sites to provide coverage for the coastal area from Cayucos to Nipomo, the incomplete link from Black Mountain to Tepesquet Peak and a need to improve security at all of the sites.

Id. at 5.^{12/} In fact, the severity of the deficiencies in the microwave system is dramatized by the fact that the system has

^{12/} See Gov. Brown Ex. 10 for a more complete description of the microwave system and its deficiencies.

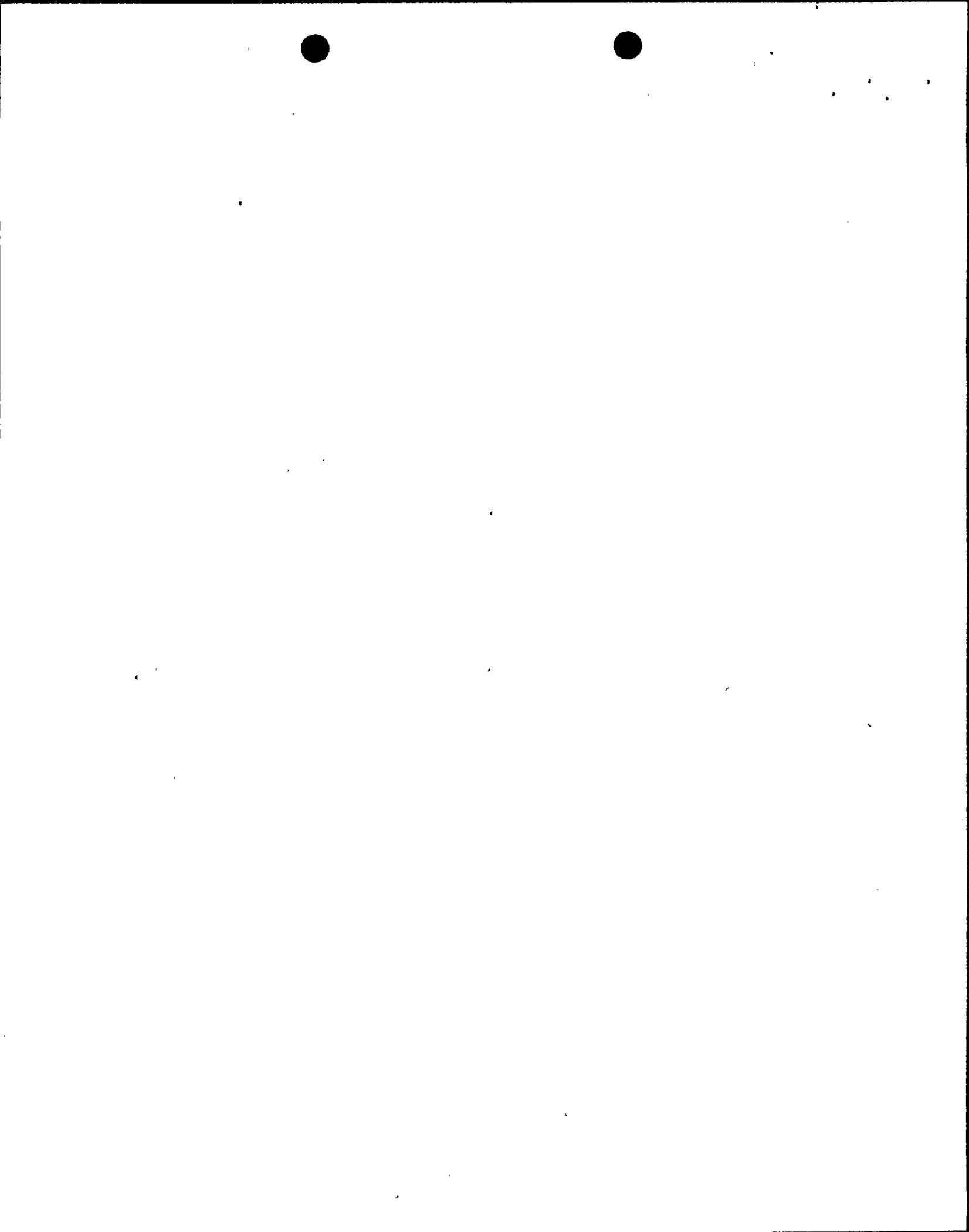


never been calibrated, a condition which means that the County of San Luis Obispo is in violation of the rules of the Federal Communications Commission. Id. at 5.

9. A microwave system which does not even comply with FCC requirements cannot possibly be deemed by this Board to be adequate for purposes of supporting communications in the event of an emergency at Diablo Canyon. The County Department of Technical Services has outlined steps which need to be taken to improve the microwave system. Id. at 8. A high priority item in this necessary upgrade is to increase the reliability of the entire microwave system by completing its "looped" configuration. Gov. Brown Ex. 9, at 5. This necessary correction was explained by the County as follows:

[T]he microwave system was originally designed as a looped system with the messages capable of traveling the loop in either of two directions (path A or path B). This loop concept was never completed due to problems in electronics completing the link between Black Mountain and Tequesquet Peak (in Santa Barbara County). This would then provide a significantly more secure system which would be much less prone to failure. There are several pieces of equipment which would need to be purchased in order to complete the loop. This equipment is noted below. Again, the completion of the loop would insure that large portions of the system would not fail if a single mountaintop site were lost (due to power failure, earthquake, etc.)

Gov. Brown Ex. 10, at 7 (emphasis supplied). Clearly, the deficiencies outlined in Governor Brown Exhibits 9 and 10 must be corrected before this Board can find that adequate communications systems exist.



10. In addition to problems with the microwave system, the County has also documented problems with other specific communications systems. For instance, the Sheriff's UHF communications network is an older, tubetype network and constitutes one of the weaker links in the County communications system. Due to age and the type of equipment being used by the Sheriff, failures are becoming more frequent, and this situation is expected to worsen. Gov. Brown Ex. 10, at 10. This is a significant problem for Diablo Canyon since the Sheriff's Department, which utilizes this unreliable communications equipment, plays a crucial role in emergency response under the County Emergency Plan. See PG&E Ex. 80 and Sheriff's SOP in PG&E Ex. 81. The communications deficiencies could be readily corrected by replacement of the old equipment with modern, solidstate radios. Gov. Brown Ex. 10, at 11.

11. The County has identified serious deficiencies in the Sheriff's dispatch center, which is the origination point for much of the communications in the County's system. Id. at 13. The dispatch center has had design flaws since the early 1970s and has been modified several times in efforts to correct these problems. However, the corrective actions have not worked and total replacement is necessary, particularly due to the added burdens which Diablo Canyon will place upon the dispatch center and the console equipment. Id.

12. Under the County Emergency Plan, the UHF Animal Control radio system is to be utilized to communicate with emergency radiological monitoring teams in the event of a Diablo



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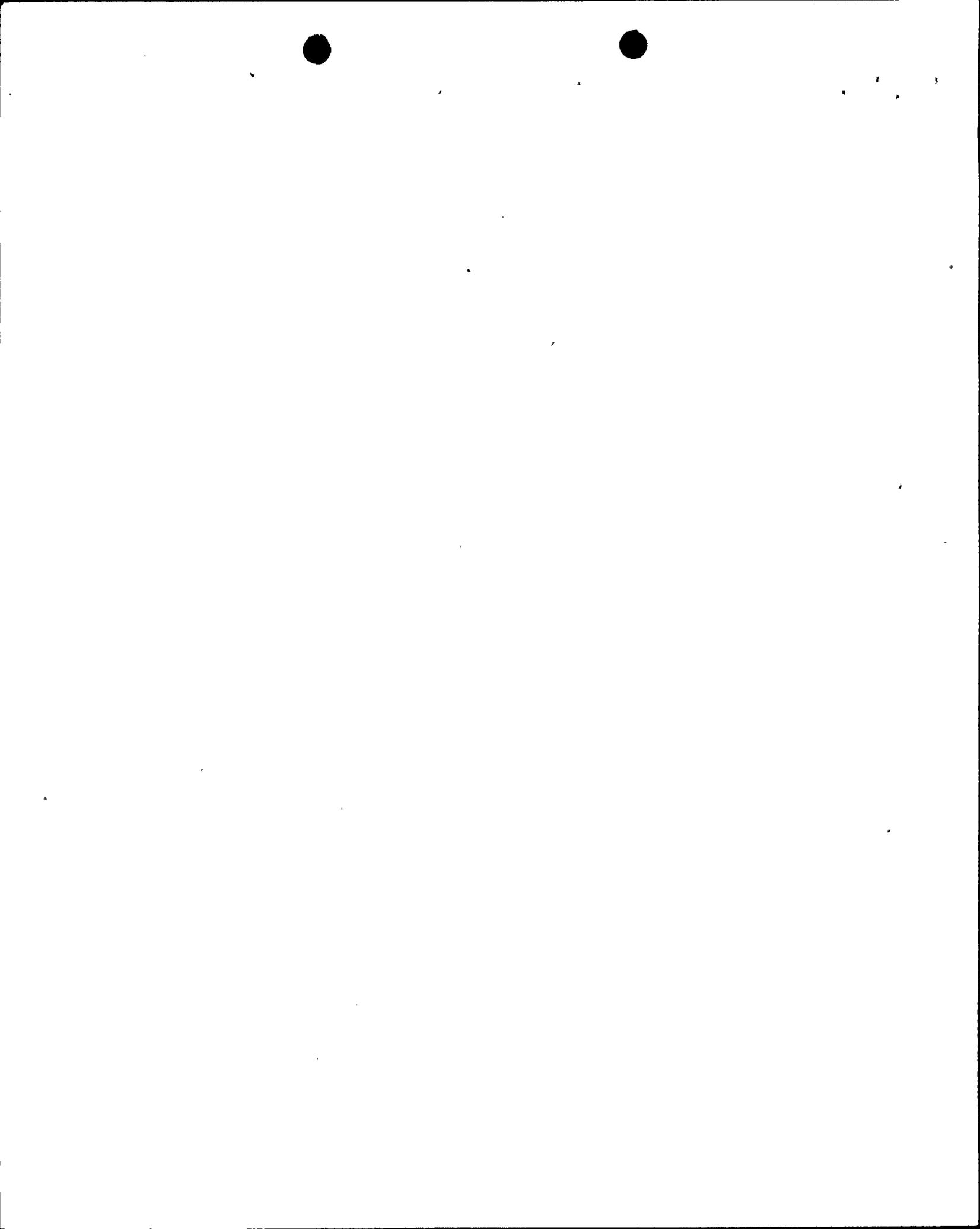
Canyon emergency. Id. at 4. This system is inadequate for that purpose. The system provides adequate coverage in the central part of the County, but "suffers from shoddy or non-existent coverage in the northern and southern ends. This deficiency is due to a single transmitter which cannot penetrate the terrain at the extremities of the County." Id. at 19.

13. Under the County Emergency Plan, adequate communications with radiological monitoring teams are an essential factor to assure accurate assessment of the course of an emergency. However, in San Luis Obispo County, adequate communications with monitoring teams do not exist due to the current lack of coverage of the UHF radio system. This system could be upgraded to provide adequate coverage by the addition of a transmitter at Point Sal in Santa Barbara County. Id. at 19-20. The need for upgrade was emphasized by PRC Voorhees:

In conducting field radiation measurements, the coastal areas nearby and southeast of the plant will be a critical area within which to take measurements. As a minimum, one additional repeater on the Animal Control frequency should be installed to cover the predominant downwind southeast sector. Davis Peak is a potential site. However, a site at Point Sal would furnish better coverage.

Gov. Brown Ex. 9, at 8 (emphasis supplied)

14. The County VHF system will be required to support the disaster control activities of the County in the event of a Diablo Canyon emergency, primarily to activate the siren system and the emergency pagers of key County personnel. Gov. Brown Ex. 10, at 4. This system currently is not adequate because it provides insufficient coverage in some areas of the County and



because it utilizes the older tube-type equipment. However, PG&E has agreed to purchase a totally new system of radio transmitters which will provide adequate coverage under this radio system.

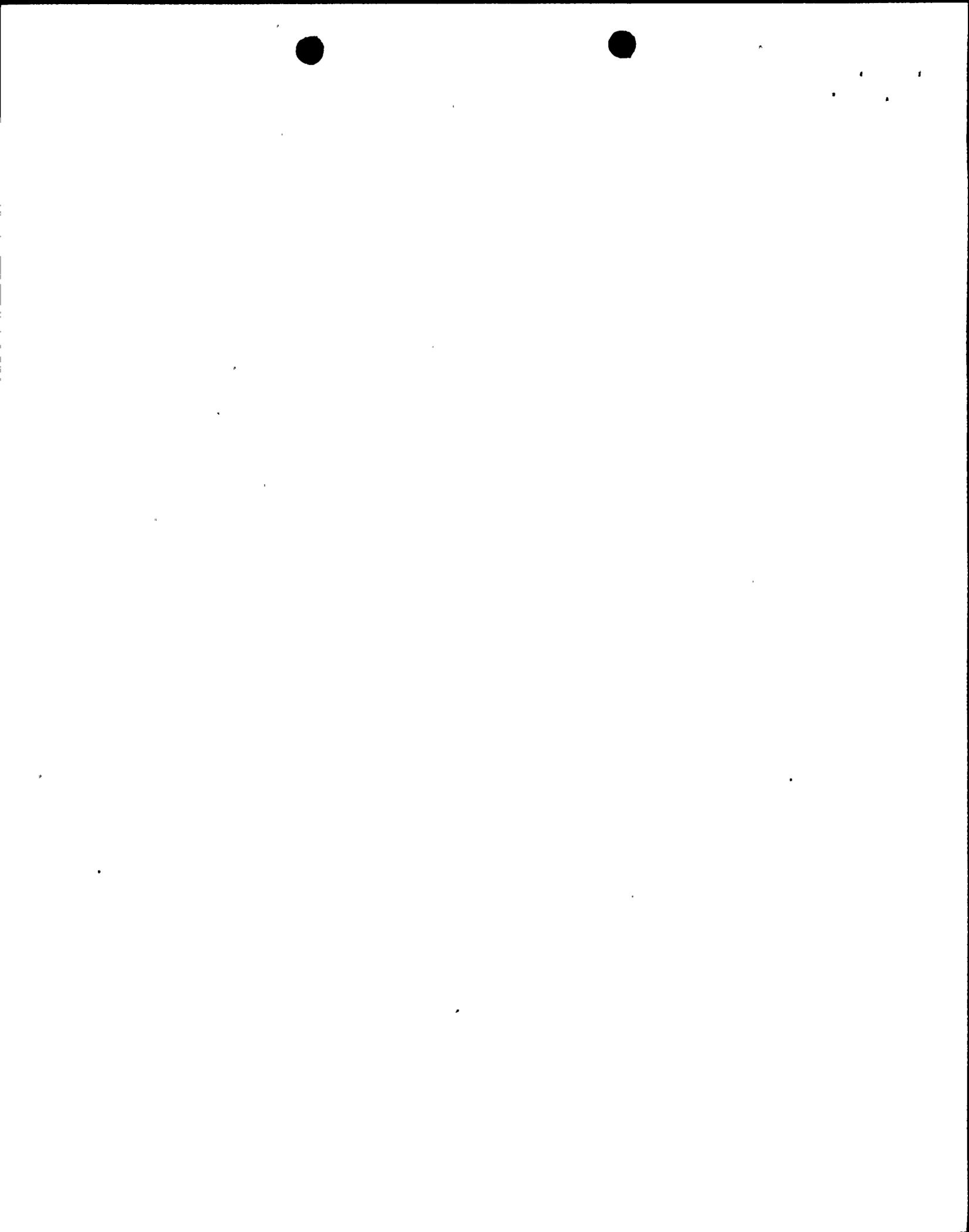
Id. at 22.^{13/}

15. There are severe deficiencies in the capacity of County staff to maintain the County communications system. As of January 1982, there were only 2-1/2 County positions for maintenance of the entire communications network. Gov. Brown Ex. 10, at 26. This is far less than the communications staff in other counties. Id. This situation, coupled with the implementation of necessary disaster control facilities in conjunction with the Diablo Canyon plant, has resulted "in an overburdened and understaffed communications maintenance facility." Id. at 28. Gov. Brown Exs. 9 and 10 outline necessary actions to improve maintenance and support help for this system. See id.; Gov. Brown Ex. 9, at 9.

16. Neither PG&E nor the Staff presented evidence to contradict the conclusions of Governor Brown Exhibits 9 and 10 that severe deficiencies exist in the County communications system.^{14/} Indeed, when Mr. Dave L. Richter, Director of the County Department of Technical Services appeared to testify, the Staff and PG&E did not ask a single question. See Tr. 12,686.

^{13/} See Gov. Brown Ex. 9, pp. 5-6, regarding many other necessary upgrade items for the VHF system.

^{14/} The PG&E and NRC/FEMA direct testimony did not even address the communications deficiencies described by the County in Governor Brown Exhibits 9 and 10.



Thus, the County's analyses stand as proof of severe inadequacies in County communications.^{15/}

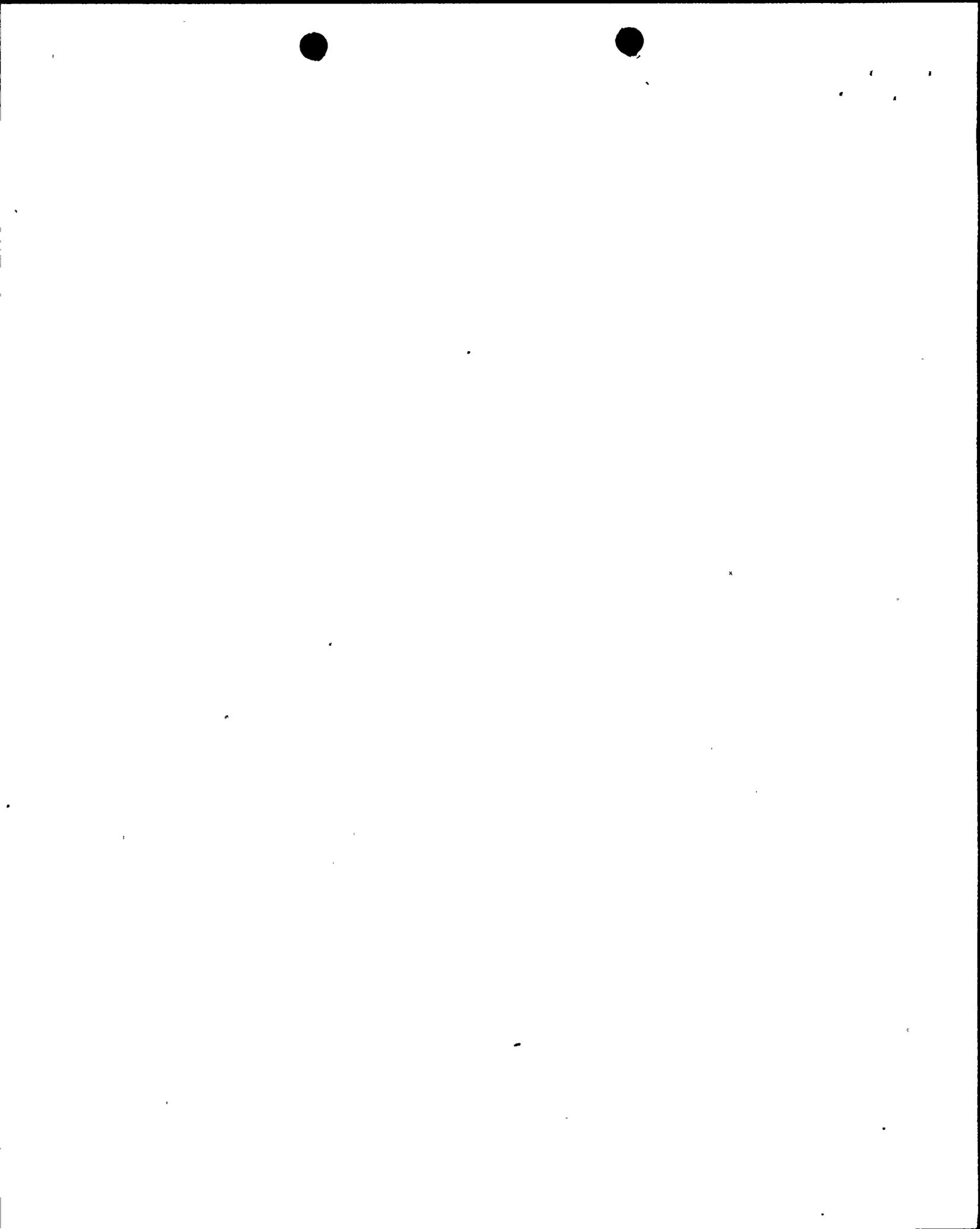
B. Discussion and Conclusions

In Governor Brown Exhibits 9 and 10, the County discloses that its radio communications network is already deficient in major respects and that it will be taxed severely by the added burdens of Diablo Canyon. This uncontradicted evidence compels the conclusion that communications in support of Diablo Canyon will not be adequate and in compliance with Planning Standard 50.47(b)(6) until the following corrective actions are taken:

- renovation of the microwave system;
- improvement of the Sheriff's communications equipment;
- replacement of the dispatch center;
- expansion of the UHF system;
- expansion of the VHF system; and
- provision for adequate maintenance personnel.

The Board should, accordingly, rule that the evidence does not support a finding that 10 C.F.R. § 50.47(b)(6) is satisfied.

^{15/} In September 1981, FEMA prepared a brief analysis of County communications needs. Joint Int. Ex. 127. The FEMA analysis, however, lacks detail and is not comprehensive in scope. It certainly does not contradict the detailed evaluations and conclusions contained in Governor Brown Exhibits 9 and 10.



VI. PG&E CANNOT AUGMENT DIABLO CANYON STAFF IN ACCORDANCE WITH 10 C.F.R. §50.47(b)(2)

A. Findings of Fact

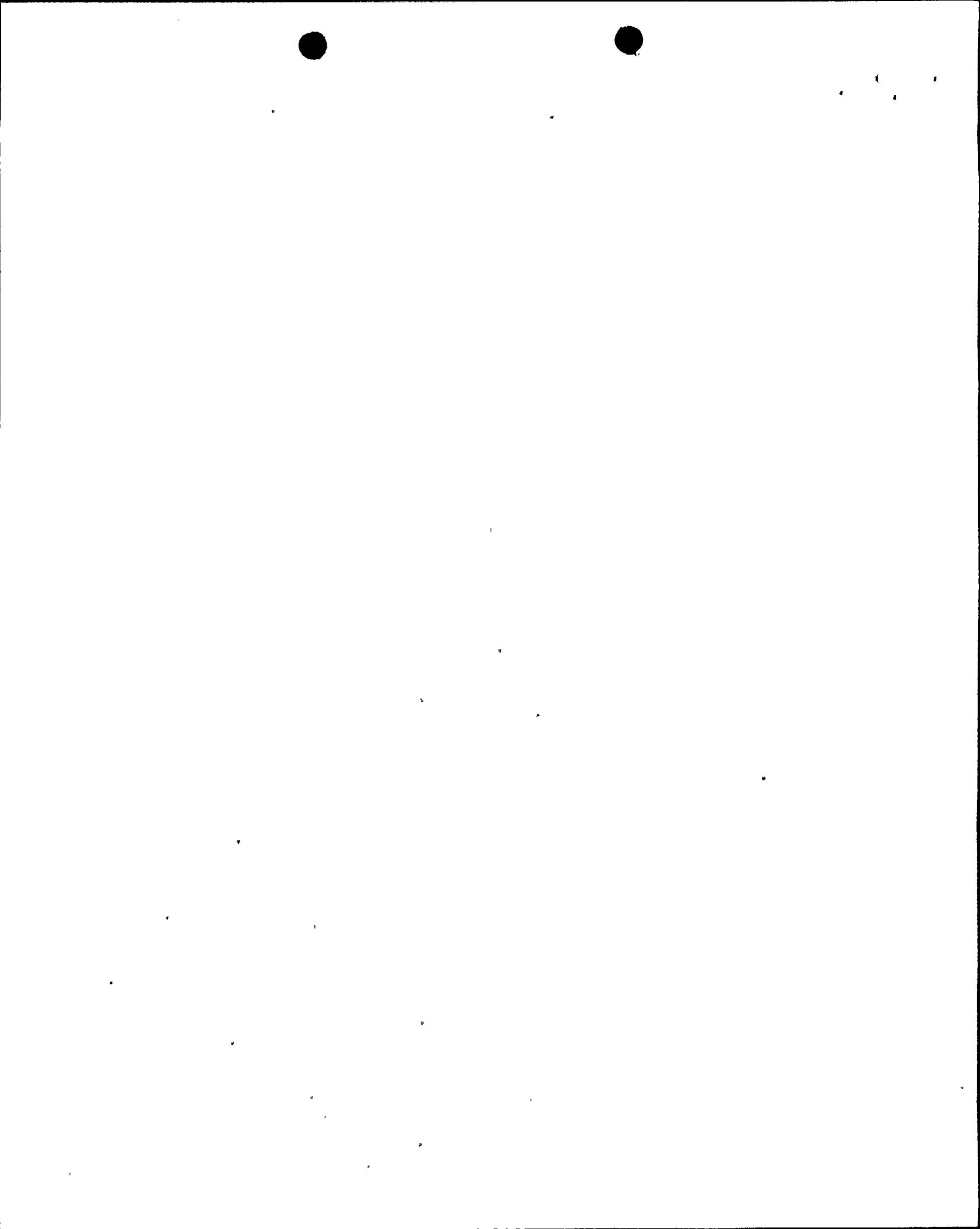
1. Planning Standard 50.47(b)(2) requires that PG&E have the capability to augment its onsite emergency response staff in a timely manner.

2. NUREG-0654 specifies that a licensee must be able to augment on-shift staff within a short period after declaration of an emergency. In Table B-1 of NUREG-0654, this goal of timely augmentation is set forth in two categories: augmentation which must be accomplished within 30 minutes (11 persons), and augmentation which must be accomplished within 60 minutes (15 additional persons). NUREG-0654 at pp. 34-38. Thus, a total of 26 additional persons must be available within one hour.

3. Under normal workday conditions, PG&E can augment its normal staff within 30 minutes in accordance with Table B-1. However, in the evenings or on the weekends, augmentation would probably not start until at least 20 minutes into an emergency, with some personnel not being able to reach the plant until 45 minutes to an hour after the emergency had commenced. Tr. 11,827 (Kaefer). It is clear, therefore, that PG&E cannot, under all conditions, meet the 30-minute staff augmentation goal of NUREG-0654.

4. The NRC Staff in Safety Evaluation Report Supplement 14 stated as follows:

While PG&E has not committed to provide additional off-shift personnel within 30 minutes of an accident because of the remote location of the site, it has committed to



provide more than 26 additional people within 60 minutes.

SSER-14, at B-2. The Staff concludes that PG&E is committed to meeting the 60-minute augmentation requirement of 26 additional persons.

5. Neither PG&E nor the Staff provided any evidence to explain why PG&E should not be required to meet the 30-minute augmentation goal specified in NUREG-0654.

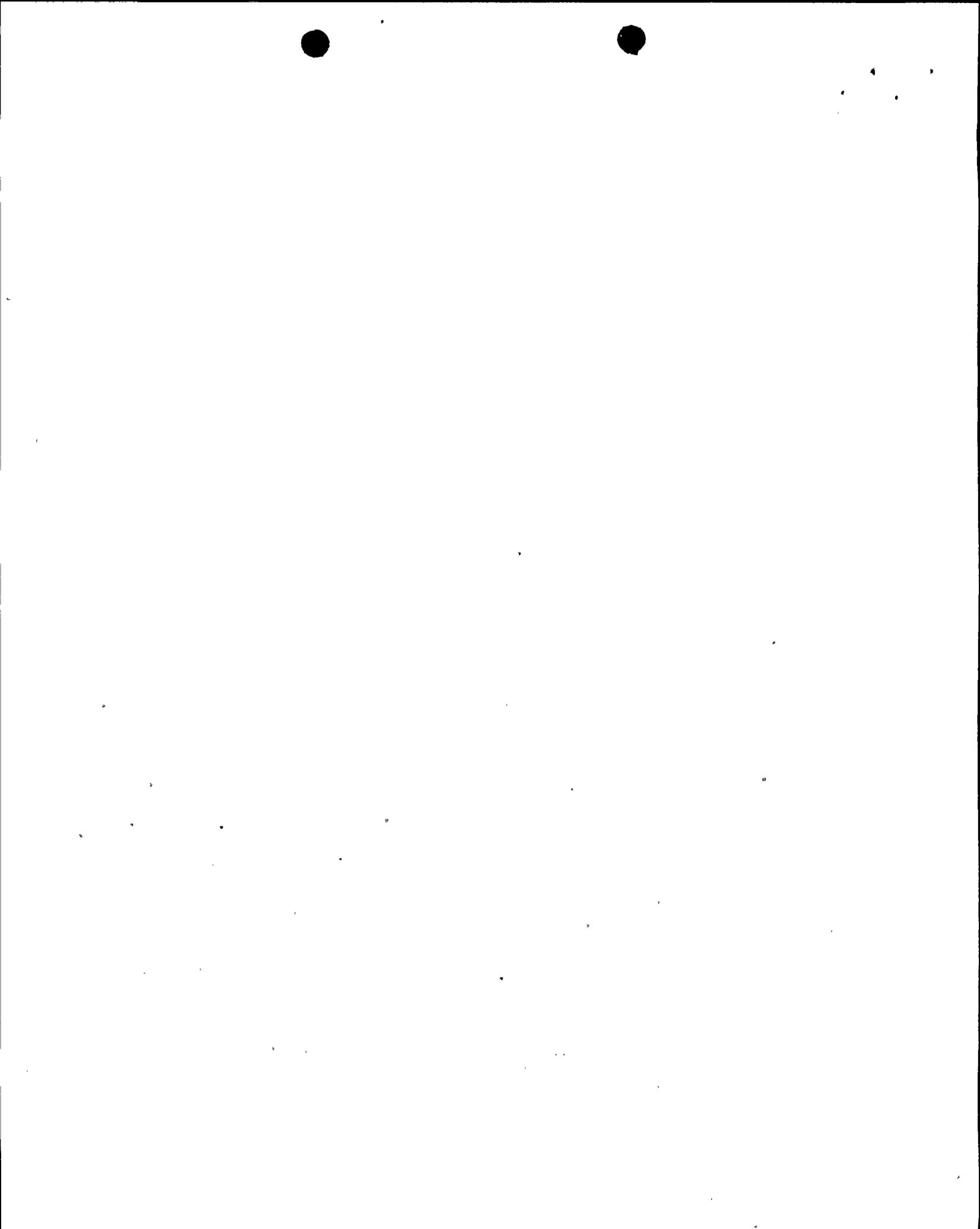
B. Conclusions and Discussion

PG&E has failed to demonstrate why it should not be held to compliance with the timely augmentation goal of NUREG-0654. The only "justification" offered by the Staff for relieving PG&E from the 30-minute augmentation requirement is the remoteness of the Diablo Canyon site. See SSER-14, at B-2. However, the remoteness of the site is irrelevant to the need for timely augmentation of the PG&E staff in an emergency.

To exempt PG&E from this requirement, there would have to be evidence demonstrating a public benefit or, at the very least, good cause coupled with the assurance that the public will not be endangered by less timely PG&E staff augmentation. PG&E and the Staff presented no such evidence. In fact, in view of the strong winds which regularly blow toward major population centers to the Southeast, there appears to be compelling need for prompt augmentation of the onshift staff in an emergency.

Indeed, in analyses prepared for the State plan, the wind conditions at Diablo Canyon are described as follows:

It can be seen from Table 2-3 that unstable conditions are never dominant at Diablo Canyon, irrespective of the direction from which the wind



is blowing. In fact, in many critical sectors the more hazardous, stable conditions are most probable. This is particularly noteworthy for the NW sector (wind blowing toward the SE -- the most probable wind direction at Diablo Canyon) where stable conditions are observed over 60% of the time. Thus, when the wind blows in this direction, it frequently blows at relatively high velocities (of the order of 15 mph) for extended periods and under stable conditions. If these conditions occurred simultaneously during the course of an accident, relatively large doses could be induced at large distances from the facility. Gov. Brown Ex. 8, at 18.

Accordingly, PG&E must demonstrate that it can and will comply with the shift manning requirements specified in Table B-1 of NUREG-0654 before the Board can find compliance with Planning Standard 50.47(b)(2).

VII. THE BOARD CANNOT FIND THAT SAN LUIS OBISPO COUNTY WILL HAVE AN ADEQUATE PUBLIC INFORMATION PROGRAM AS REQUIRED BY 10 C.F.R. § 50.47(b)(7)

A. Findings of Fact

1. Planning Standard 50.47(b)(7) requires San Luis Obispo County to implement a public information and education program.
2. San Luis Obispo County has not yet implemented a public information program. Indeed, County Supervisor MacElvaine stated that the vast majority of the County's residents probably do not even know which evacuation routes are to be used in a Diablo Canyon emergency. Tr: 12,251-52.
3. Mr. Eldridge of FEMA testified that (as of January 26, 1982) he does not believe the County population is well informed with respect to actions to take in the event of an emergency. Tr. 12,718. This confirmed FEMA's November 2 finding



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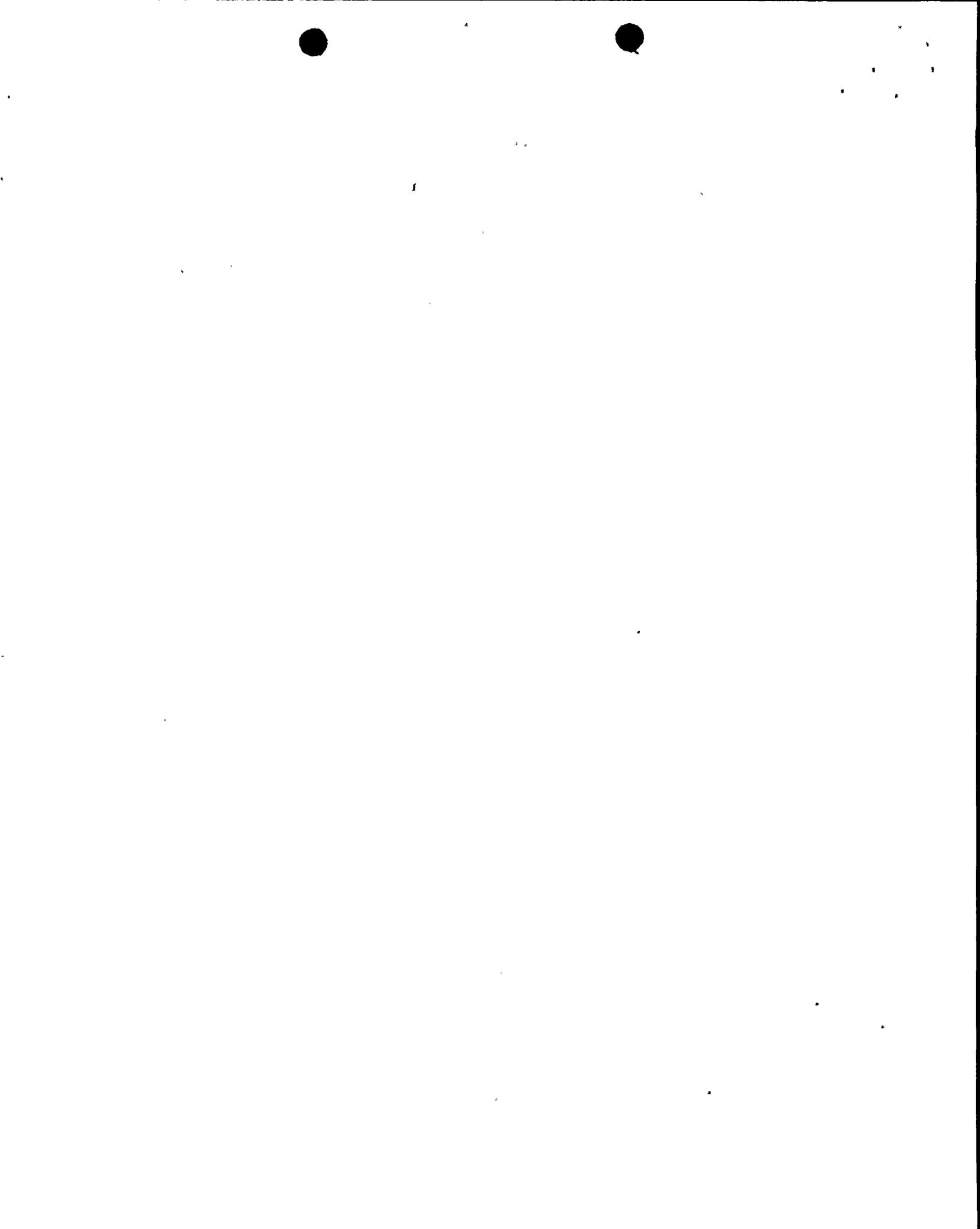
that a County public information program had not been carried out. See Attachment 2 to PG&E Testimony, at 4, foll. Tr. 11,782.

4. PG&E's Panel 2 testified on efforts PG&E intends to take to educate the public, and also outlined steps that PG&E expects the County to take with respect to public education. See testimony foll. Tr. 12,118. The County itself offered no evidence of steps it intends to take to institute a public information program. PG&E's testimony regarding public education listed a series of general actions underway (newsletter, telephone book pages, etc.). But, PG&E did not perform a social survey or develop a social profile of the County's population in order to identify community traits and characteristics which would assist the formulation of a public information program.

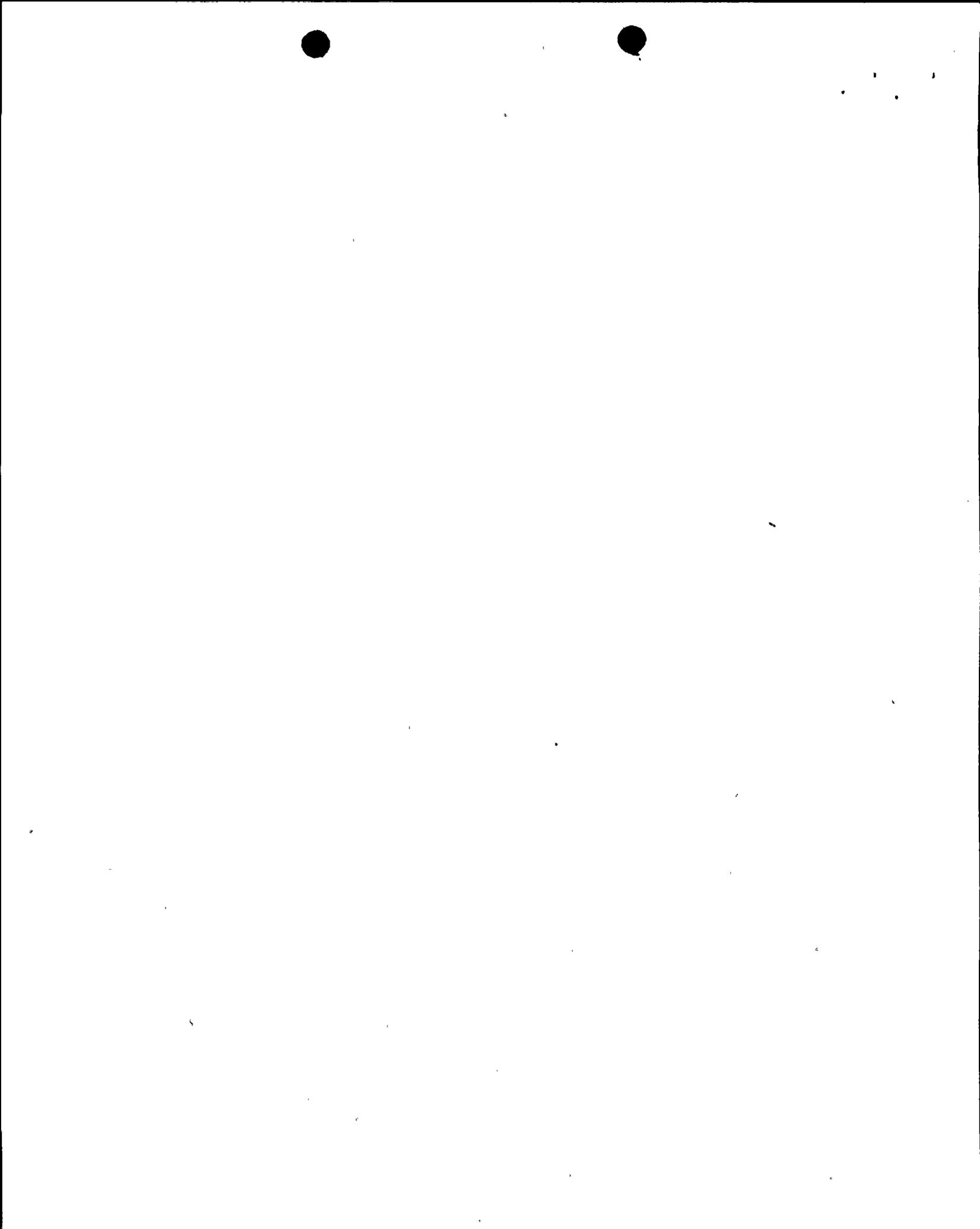
5. Joint Intervenors offered testimony concerning public information programs by two highly qualified experts -- Dr. Kai T. Erikson, Professor of Sociology at Yale University, and Dr. James H. Johnson, Jr., Assistant Professor of Geography at UCLA. Testimony foll. Tr. 12,407.

6. Dr. Erikson and Dr. Johnson, testifying separately, reached the same conclusion: to develop and implement an effective public education program for San Luis Obispo County, a social survey should first be prepared to obtain knowledge about the attitudes and perceptions of County residents. The results of the survey could then be used to sharpen the development of the County's public education program. Id.

7. Dr. Erikson explained the need for a social survey as follows:



- (a) An emergency involving the risk of radiation is different from most natural disasters and human accidents, particularly because most natural disasters have a clear beginning and end. A nuclear emergency, however, involves a long-term, invisible threat. This form of event often provokes deeper and more lasting forms of public anxiety. Erikson Test. at 3-4, foll. Tr. 12,407.
- (b) In an emergency, a substantial number of people are likely to over-react: that is, they "will evacuate before being advised to, will move longer distances than advised, and, in general, will respond to their own feelings of alarm by doing more than is required and doing it earlier than is required." Id. at 4. At the same time, a substantial number of other people will under-react and become immobilized. These tendencies to overreact and underreact are likely to be greater when radiation is involved, "because people do not know what the dangerous substance looks like or feels like, how far it can reach out into the countryside, or how long its effects can last." Id. at 5.
- (c) There are good reasons to believe that emergency workers will experience severe role conflicts, particularly concerning their natural desire to care for and be with their families. An evacuation plan which assumes workers will report for duty regardless of



family obligations runs a high risk of failure. Id. at 5-6.

8. Dr. Erikson testified that a social survey would provide important information regarding the matters itemized in 7a-c, above. Id.

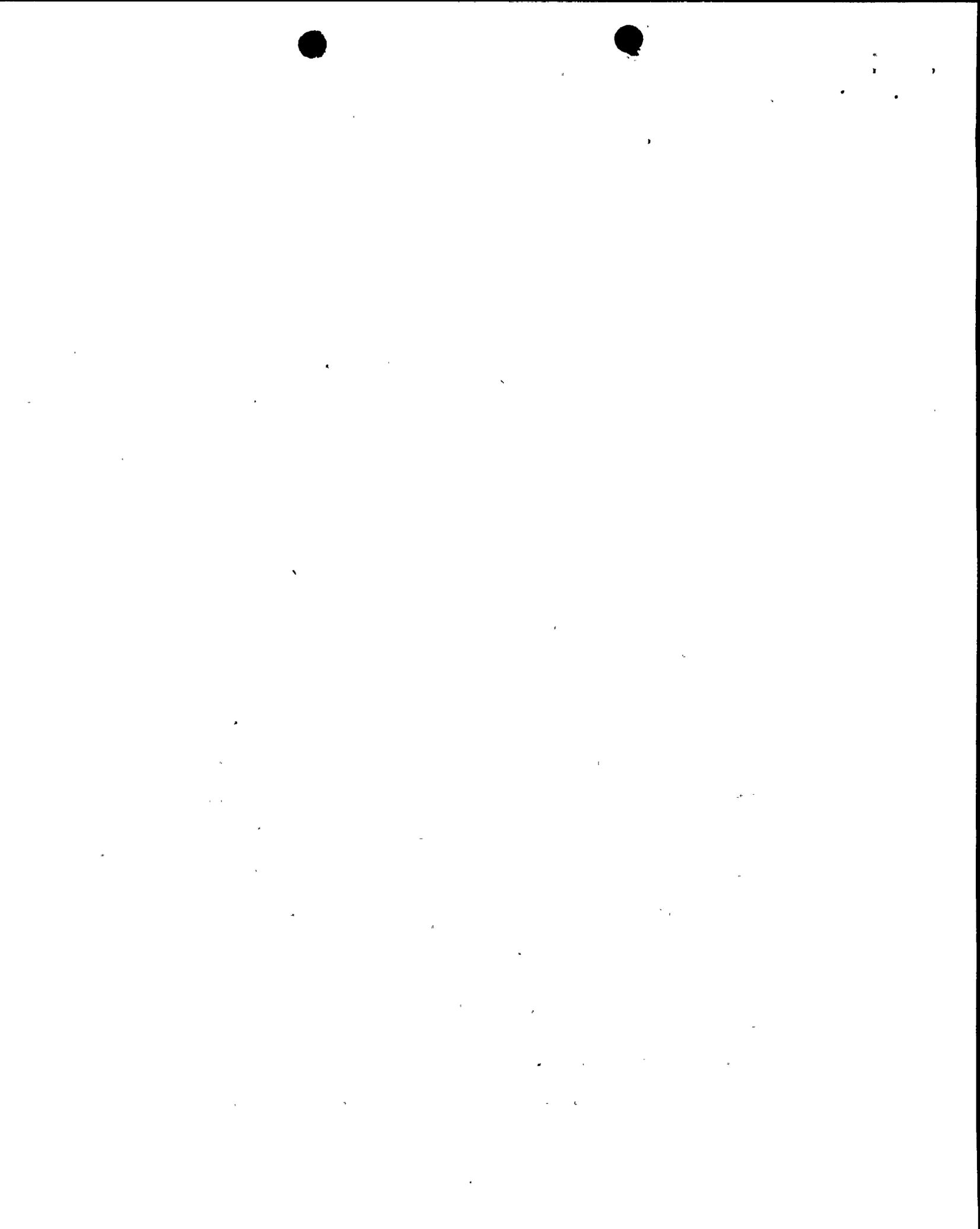
9. Dr. Erikson also emphasized that a social survey would provide important data on the attitudes and outlooks of the people who are to evacuate in an emergency or are to aid in an evacuation. With respect to emergency workers, the survey would provide particularly valuable information:

(a) how the people of San Luis Obispo County who may be called upon for emergency duty feel about those prospects, (b) what proportion of the emergency work force has family obligations that might prove to be a source of conflict, and (c) what actions the emergency workers intend to take in the event a serious accident occurs. Id. at 8.

10. Dr. Erikson stated that the social survey would also help test other key assumptions contained in the County Plan: Would parents of school-age children be willing to evacuate without first-hand knowledge that their children were well cared for? Would residents believe warnings? What are the sources of information that the population consider to be credible? Would people follow instructions regarding evacuation directions or would they take "preferred evacuation directions" which the Plan now overlooks? Id. at 9-10.

11. Dr. Erikson reached the following overall conclusion:

It is my opinion, then, that a social and psychological profile of the local population should be undertaken by an able research organization The [County] plan is full of detail, but



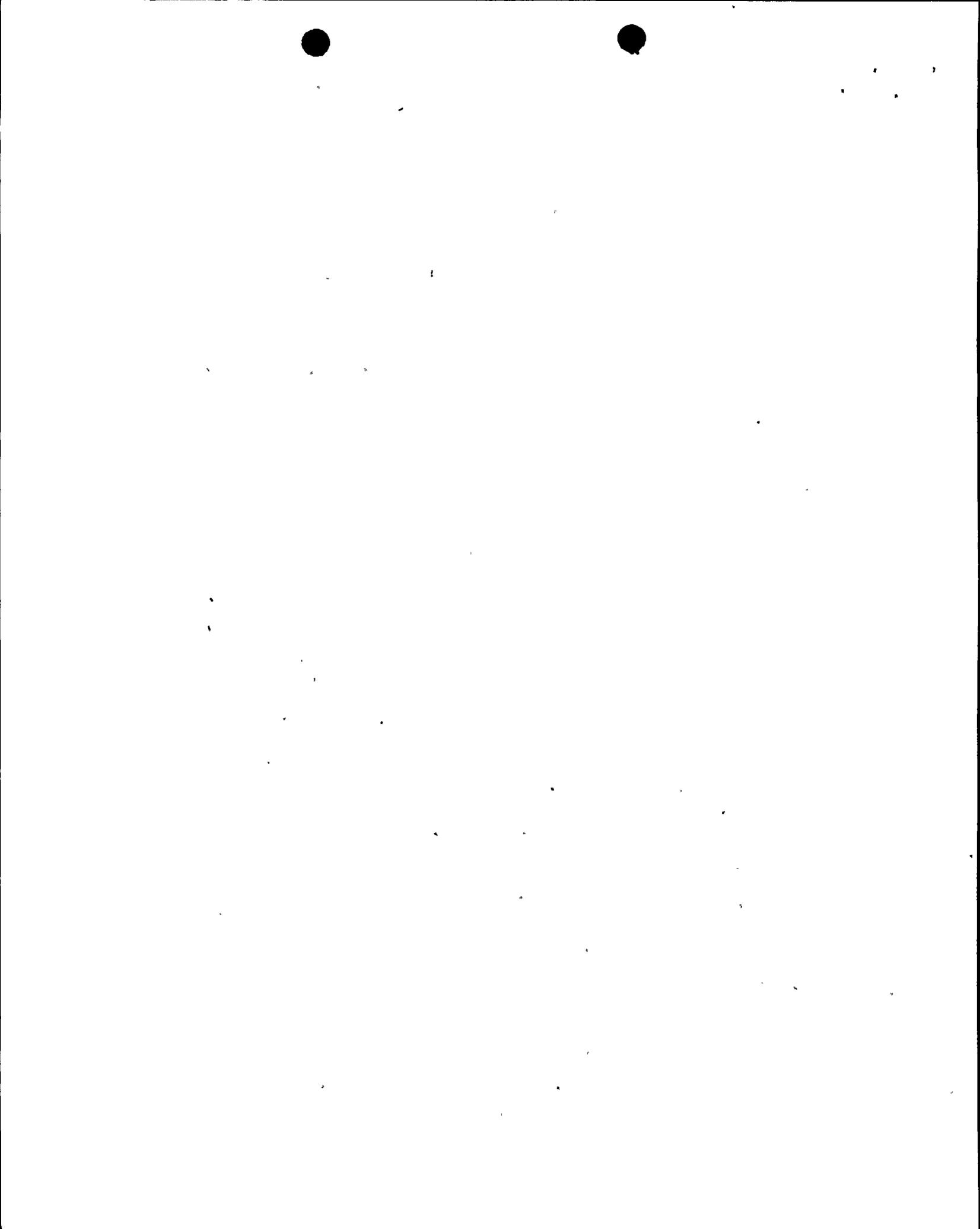
whether or not it is capable of implementation depends to a very large extent on the attitudes and intentions and emotional reflexes of the human beings charged with carrying it out. If it is incapable of implementation, then simple logic dictates that it will provide no real protection to the public.

* * *

Such a survey would serve two purposes. It would prove invaluable as a supplement to the present emergency plan, and the information it could supply would help immensely in whatever program of public information is being contemplated for the area. Id. at 10-11.

12. Dr. Johnson co-authored a major study of the public's response to the TMI accident. The principal conclusions of that study were:

- (a) The official evacuation advisory at TMI caused persons to depart from a much larger area than was originally intended or called for by the advisory. If only the persons advised to evacuate had left the area, the number of evacuees would have been approximately 2,500 pre-school children and pregnant women within a five-mile radius of the plant. Instead, an estimated 144,000 persons (39 percent of the total population) evacuated their homes in an area as far as 15 miles from the plant. This tendency for people outside the designated zone to evacuate is known as the evacuation shadow phenomenon. Johnson Test. at 2-3, foll. Tr. 12,407.
- (b) The TMI evacuation is the longest on record, and evacuees travelled a median distance of 85 miles. Most evacuees went north and west of the crippled reactor,



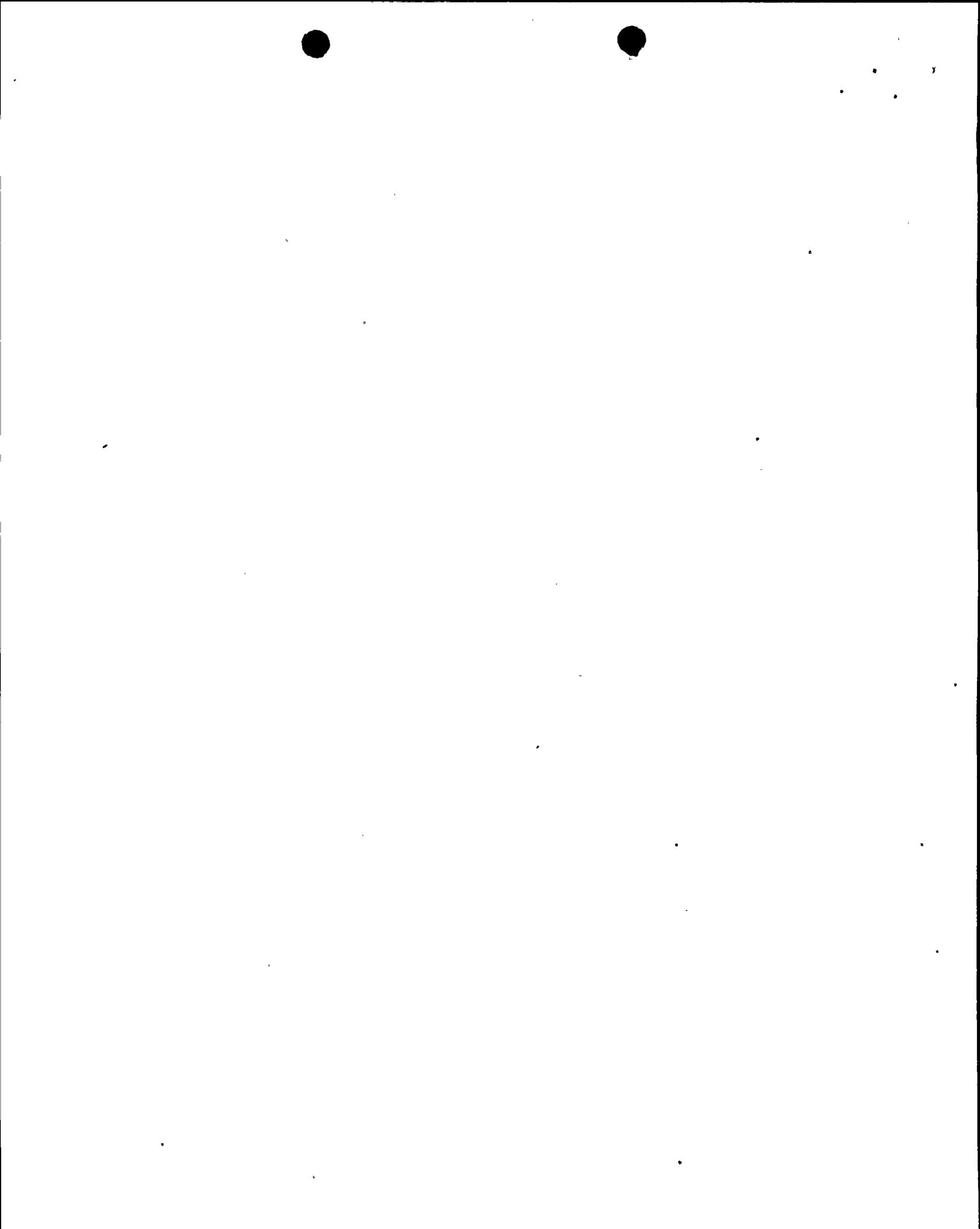
with the directional bias reflecting a preference for a site upwind from the plant, a psychological attraction to the mountains in time of danger, and a reluctance to select a destination in the more densely populated metropolitan areas to the east. Id. at 3.

- (c) Eighty-one percent of the evacuees stayed with relatives and friends. Few people used the evacuation shelter at Hershey, Pennsylvania. Id.

13. Dr. Johnson reviewed the various evacuation time estimates prepared for Diablo Canyon (PG&E Exs. 78, 84), as well as the October Draft of the County Plan. PG&E Ex. 80. Dr. Johnson reached the following conclusion:

I am of the opinion that the evacuation times estimates derived in these studies are likely to be grossly underestimated, in large part because each fails to consider and allow for any of the findings of our TMI Study . . . , including the directional bias of the evacuees, the distances traveled by them, and, most importantly, the evacuation shadow phenomenon. Although the evacuation shadow may not be a major consideration in evacuation planning for natural hazards, it is especially critical in planning for future nuclear accidents precisely because the geographical scope of an invisible danger such as ionizing radiation is difficult for public officials and private citizens to determine In planning for evacuation from a nuclear disaster, it can, therefore, be projected that any order to evacuate will cause the departure of residents not only from the designated zone, but also from its peripheries. The planning process should accommodate responses from the two areas. No such accommodation or consideration appears in any of the documents which I have reviewed regarding Diablo Canyon. Johnson Test. at 4-5, foll. Tr. 12,407.

14. Dr. Johnson further concluded that the Diablo Canyon plans have a further serious deficiency:



The plans also assume the willingness of the evacuees to follow orders concerning the direction of evacuation, the evacuation routes, and the evacuation destinations. [H]owever, this assumption is not borne out by our study at TMI, which showed, for example, that the evacuees stayed at the homes of relatives and friends rather than utilizing designated shelters and that their evacuation destinations reflect the influence of other subjective factors, such as a strong directional bias, a psychological attraction to the mountains, and a reluctance to select a destination in the more densely populated metropolitan areas. The failure to consider these kinds of factors in the Diablo Canyon plans raises doubt in my mind about the accuracy of their evacuation times estimates. Id. at 5.

15. Dr. Johnson proposed the following steps to correct the deficiencies in San Luis Obispo County planning:

To accommodate the evacuation shadow phenomenon and related factors in the evacuation plans for the Diablo Canyon Nuclear Power Plant, a survey should be designed and a profile of the population residing within a fifty-mile radius of the plant should be taken. Specifically, the survey instrument should be designed to gather the following types of data or information about the population:

- (1) socioeconomic and demographic characteristics (e.g., race or ethnicity, age and sex structure, family size, occupation, education, automobile ownership, etc.);
- (2) daily activity patterns (neighboring and other interaction patterns, including journeys to work, school, recreation, shopping, medical care, and church);
- (3) images, attitudes, and beliefs about (a) nuclear power, (b) disasters, and (c) the agencies involved in the implementation of evacuation plans; and
- (4) decision-making in response to hypothetical nuclear disasters of various magnitudes.

* * *

The results of such a survey combined with data on the institutional population and the physical characteristics of the area, should then be used



as a basis for intelligent decision-making. Specifically, the data could be utilized to (a) describe the population and settlement geographies of the potentially affected area; (b) determine the transportation routes that would be most suitable for evacuation; (c) establish optimal locations for evacuation shelters; (d) predict the movement patterns of evacuees in order to regulate the mass evacuation of an area; (e) plan for the delivery of emergency services and supplies in the evacuation field; (f) create networks for the communication of disaster information and for the delivery of services in the zone of evacuation; and (g) identify the locations that would be most difficult to evacuate because of physical constraints, personal immobility, or attitudinal resistance. Id. at 5-7.

16. Both PG&E and the Staff chose not to cross-examine Dr. Johnson or Dr. Erikson on their direct testimony. Tr. 12,421. The Staff offered no testimony to refute the testimony of either.

17. PG&E offered testimony of Dr. Dennis S. Mileti, an Associate Professor at Colorado State University, who opined that a social survey in San Luis Obispo County was not required. Mileti Panel 2 and Panel 6 Test. foll. Tr. 12,118 and 12,184, respectively. Dr. Mileti stated his belief that sufficient knowledge exists, largely from studies of natural disasters, to prepare plans and public information programs designed to accommodate all sorts of public attitudes. Id. Dr. Mileti reached the following conclusion:

In summary, sufficient knowledge exists about public behavior during emergencies that would apply to those that might result from a nuclear power plant accident, to assure early notification and delivery of clear instructions during emergencies as well as to assure a proper pre-emergency public information [sic] without the conduct of a social survey of the populace within the plume exposure pathway Emergency Planning Zone. Id.

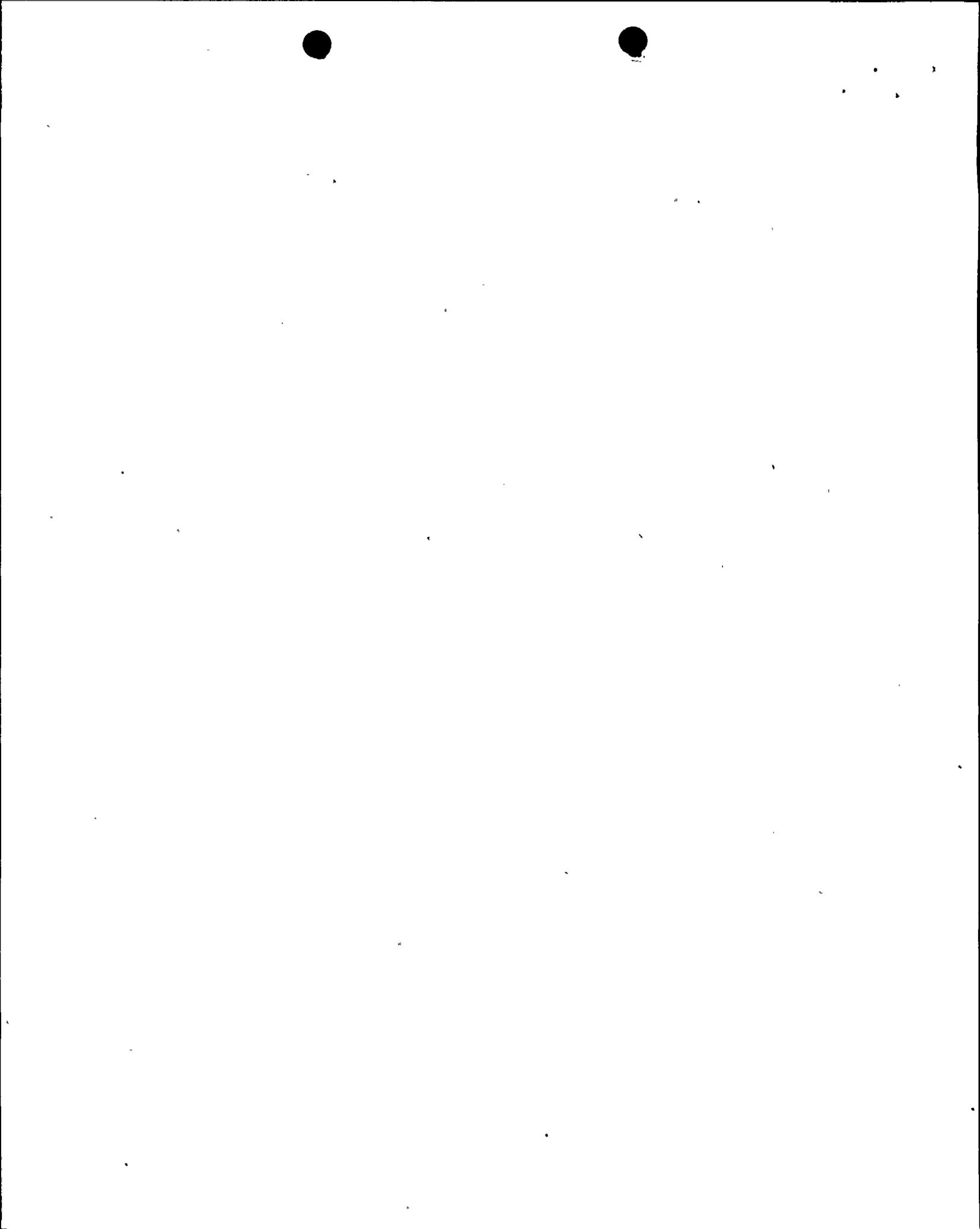


18. Dr. Erikson and Dr. Johnson sharply disagreed with Dr. Mileti's extrapolations from natural disasters, noting particularly that the uncertainties presented by a radiological emergency prevented confidence in making such extrapolations. Tr. 12,408-09 (Erikson); 12,411 (Johnson).

19. Dr. Mileti testified on cross-examination that his conclusion relied on 40-60 studies of how humans respond to disaster warnings. However, only three of these studies involved nuclear matters: the Japanese nuclear bomb experience in World War II, the Windscale accident in England, and the TMI accident. The Japanese experience, of course, has no similarity to a nuclear power plant accident. As for Windscale, Dr. Mileti provided no information regarding the population affected at Windscale or of the nature of the accident or conditions there which might suggest similarity to an accident at Diablo Canyon. Only the TMI accident involved a nuclear power plant accident. Tr. 12,145-46 (Mileti).

20. Dr. Mileti performed no surveys of any kind in San Luis Obispo County to determine the social or demographic characteristics or the attitudes of the population toward nuclear power. Id. at 12,146, 12,227.

21. Dr. Mileti acknowledged that the credibility of the source of information is very important in a disaster situation. Id. at 12,154-55. Dr. Mileti provided no data to indicate that credible information sources have been identified in San Luis Obispo County.



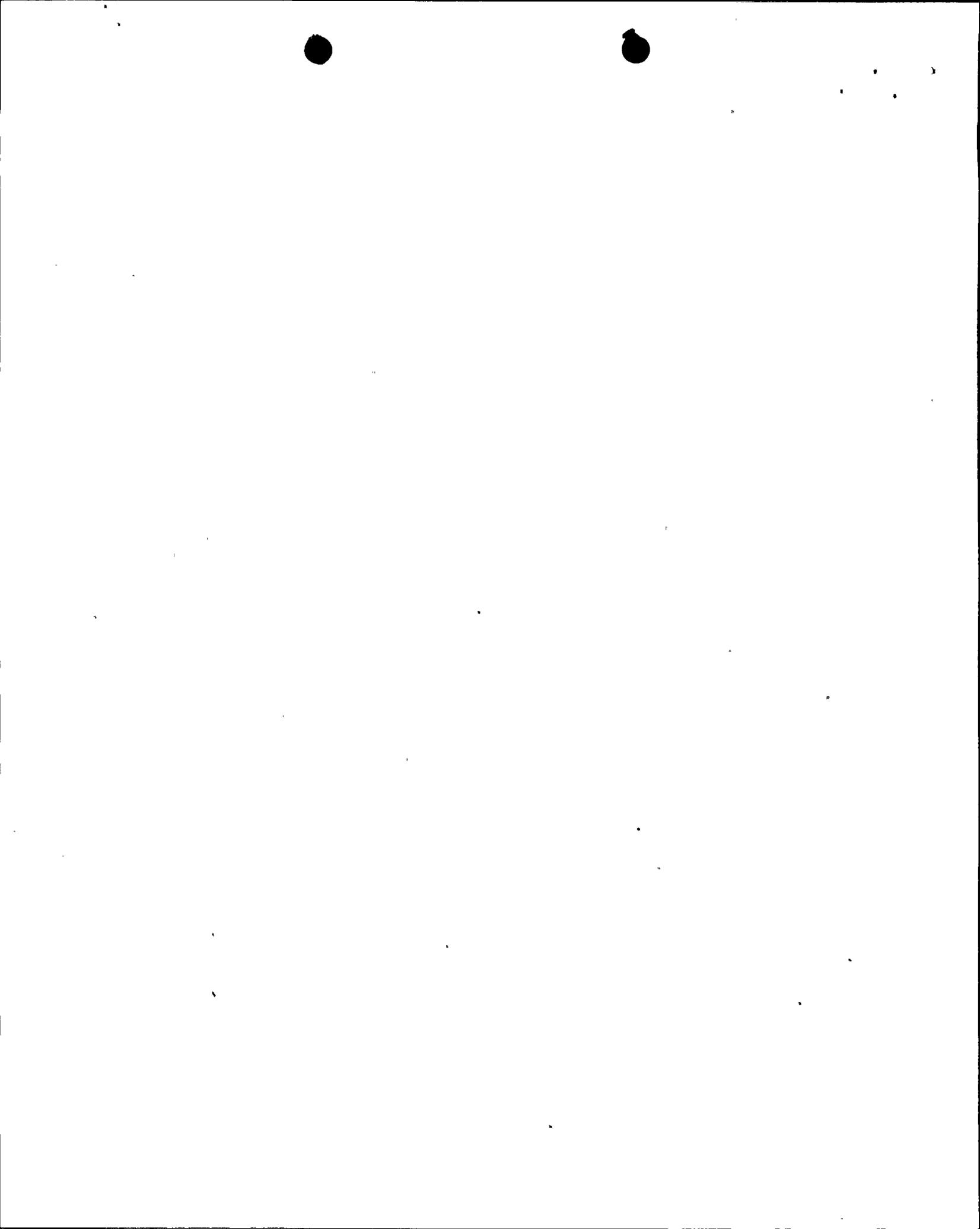
22. Dr. Mileti cautioned that a survey which is performed poorly can have negative effects, since such a survey can alter a person's opinions and perceptions. Tr. 12,156. Dr. Mileti agreed, however, that an effective survey is feasible (Id. at 12,156), and Dr. Johnson explained that a properly prepared survey would avoid any negative effects. Tr. 12,420-24 (Johnson).

23. Dr. Mileti also cautioned that a social survey might not be entirely accurate. Dr. Erikson, however, explained that a survey would be far more reliable than having no direct information, and would be invaluable in determining how best to provide emergency information to the public. Tr. 12,425, 12,428 (Erikson).

24. In light of the foregoing, the Board finds that a social survey should be performed to identify perceptions and attitudes of the residents of San Luis Obispo County that bear on the development and implementation of the County's emergency plan. Without such a survey, information essential to an effective public information program will be lacking. Tr. 12,429 (Erikson).

B. Discussion and Conclusions

Neither PG&E nor the County has obtained the kinds of information that Dr. Erikson and Dr. Johnson have identified as important to emergency planning at Diablo Canyon. The result is that no data have been gathered on community attitudes or fears that would be evoked by a radiological emergency. The emergency

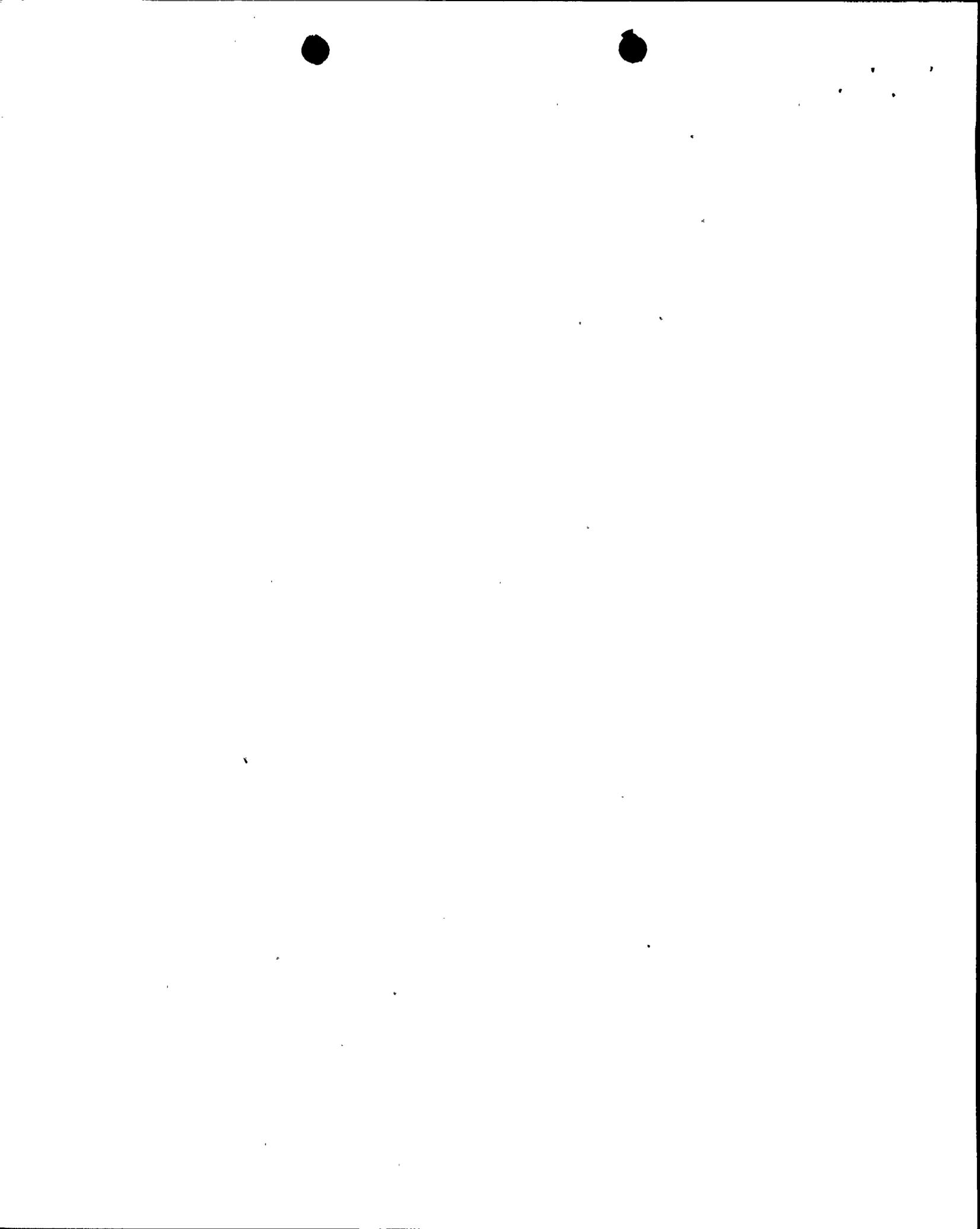


plans that have already been drawn entirely overlook these considerations.

Also, the public has not been surveyed to determine the credibility of the possible sources of information in a radiological emergency. Surely, PG&E's credibility must be seriously questioned, given the company's continuing mistakes ranging from the belated discovery of the Hosgri fault through the recent disclosures of unprecedented design and construction discrepancies.

Finally, emergency planning at Diablo Canyon has not addressed potential role conflicts among emergency workers, as suggested by Dr. Erikson, or the evacuation shadow phenomenon described by Dr. Johnson. Each of these factors is particularly relevant to radiological emergency planning, and without considering these factors the current plans lack essential ingredients of realism.

The evidence before this Board compels a finding that PG&E be required to commission a social survey of the type recommended by Dr. Erikson and Dr. Johnson. The testimony of these witnesses demonstrates the specific ways in which the results of that survey would improve emergency preparedness at Diablo Canyon. Until the survey is completed and the data are integrated into the planning effort, this Board cannot find that there has been compliance with Section 50.47(b)(7).



VIII. THE COUNTY PROCEDURES FOR USE OF EMERGENCY SIRENS TO ALERT THE PUBLIC ARE DEFICIENT

A. Findings of Fact

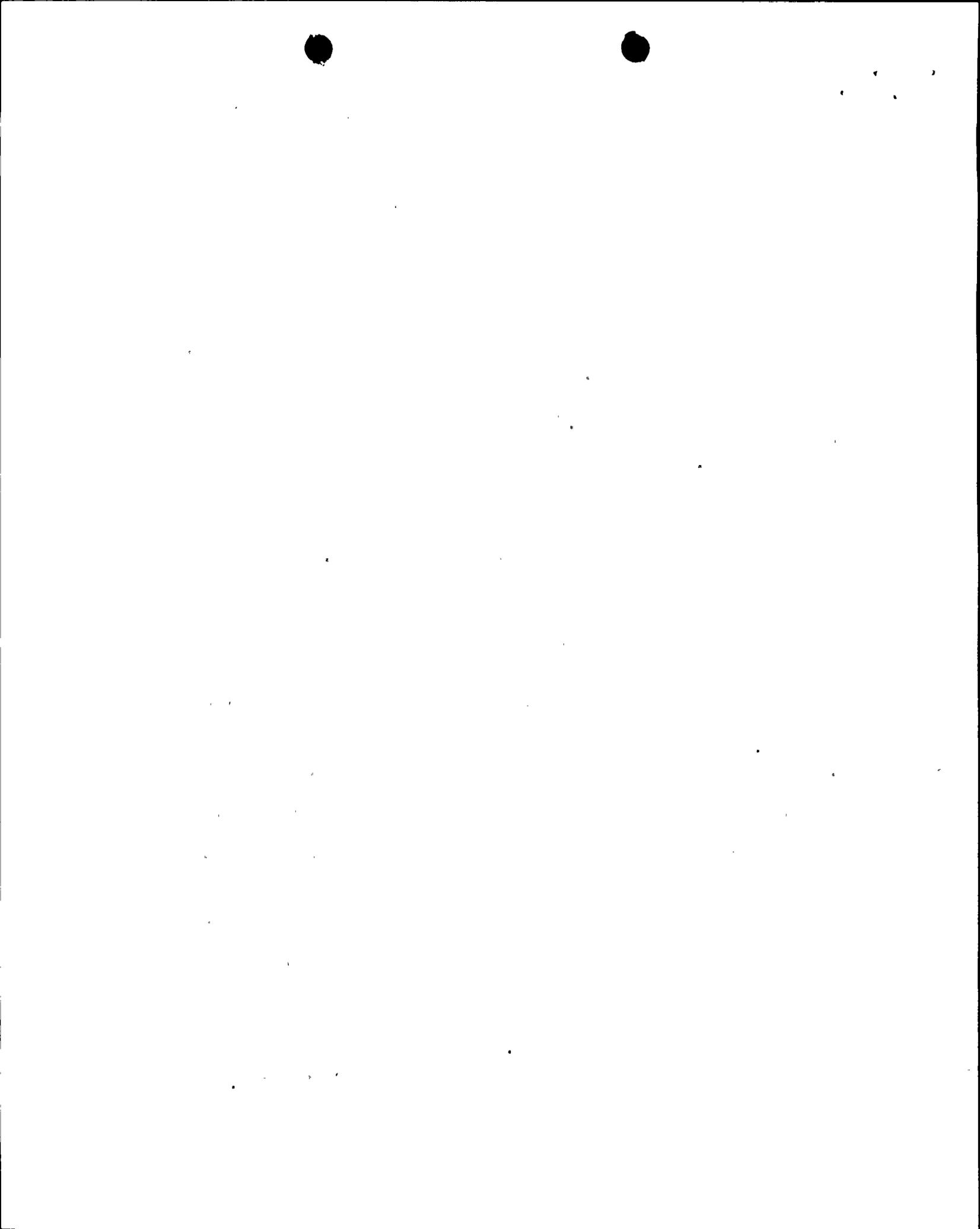
1. It is intended that the public will be alerted to the existence of a radiological emergency at Diablo Canyon and the need for protective actions by broadcasts on specified radio stations. The public will be alerted to turn on their radios by the sounding of emergency sirens. PG&E Panel 2 Test., foll. Tr. 12,118.

2. The County intends to make sounding of the sirens and, hence, alerting of the public mandatory only if a General Emergency is declared. The sirens may be used in the event of a Site Area Emergency, but such is not mandatory. The sirens are not proposed to be used at all at the Unusual Event or Alert stages. PG&E Ex. 80, Table I.4-4; Tr. 12,485 (Ness).

3. The sounding of the emergency sirens will not instruct the public to take any protective actions. Rather, the sirens will only direct the public to listen to the radio for instructions. See Tr. 12,517 (Ness).

4. The County intends to utilize the sirens to alert the public only when the County wants the public to take protective actions, either sheltering or evacuation. The County does not intend to use the sirens to alert the public of a potential emergency and to standby for possible protective action recommendations. Tr. 12,487, 12,508-10 (Ness).

5. The sounding of the sirens early in an emergency, for instance at the Alert stage, would allow the public more time to prepare for protective actions which could later be



necessary. Since the process of tuning into radio stations and gathering family and possessions would already be accomplished, people would be ready to take protective actions promptly if so ordered. Tr. 12,488 (Ness).

6. If the public were properly instructed on the meaning of the sirens (i.e., tune in the radio and wait for further instructions), there would be no disadvantages to sounding the sirens and starting radio broadcasts early in an event, such as at the Alert stage. Tr. 12,517 (Ness).

7. The lack of early (simulated) notification of the public was a prime deficiency of the August 19, 1981, Diablo Canyon emergency exercise. That exercise had the following sequence:

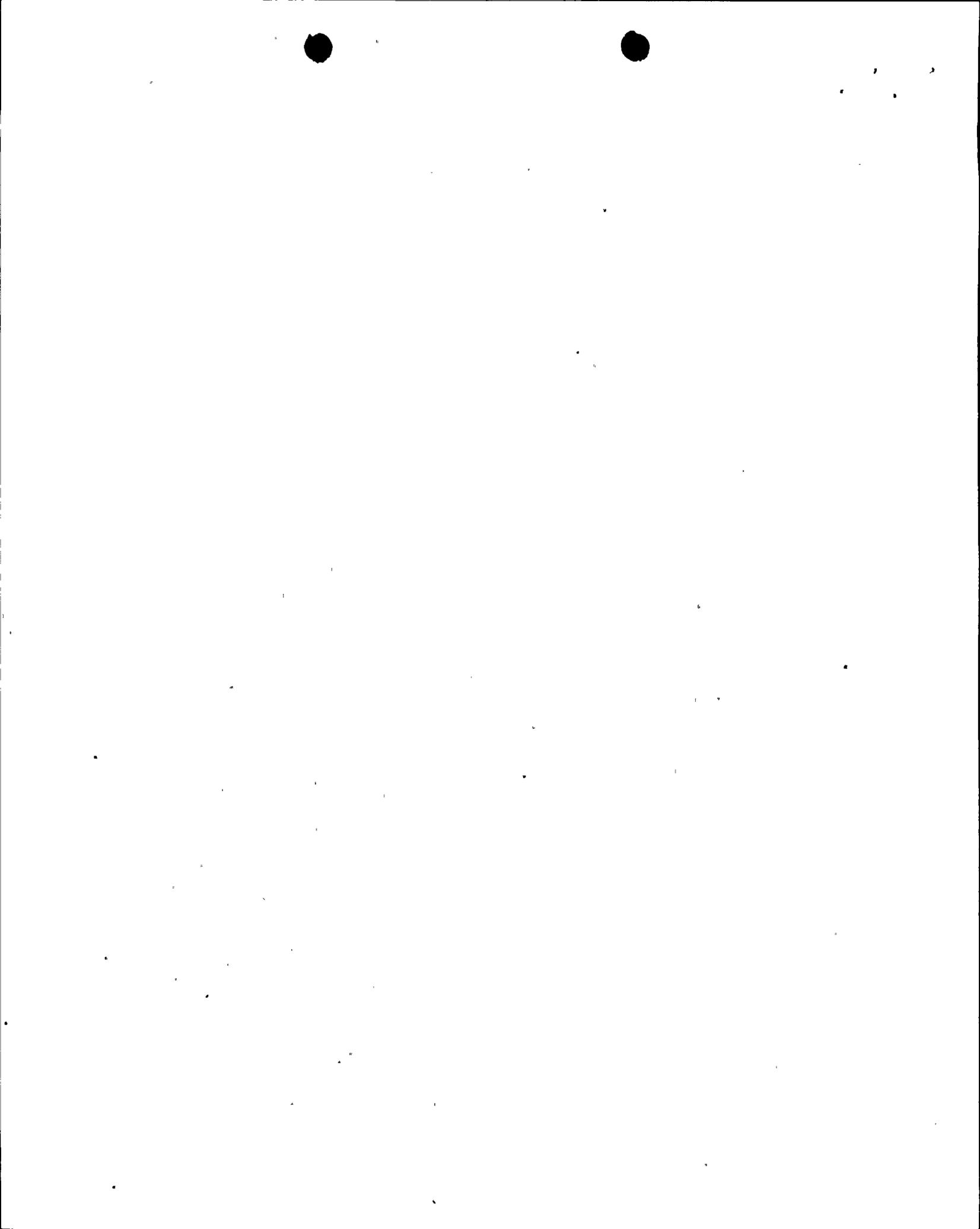
7:02 a.m.	Unusual Event declared
7:10 a.m.	Alert declared
8:12 a.m.	Site Area Emergency declared
10:48 a.m.	General Emergency declared

Attachment 1 to PG&E Test., pp. I-7 and I-8, foll. Tr. 11,782.

Allowing for a 30-minute lunch break during the exercise, the sirens were not sounded and radio broadcasts were not commenced until at least 45 minutes after the General Emergency was declared. Id. This delay in alerting the public has been widely criticized. Id. at II-5; Tr. 11,836 (Shiffer).

8. In San Luis Obispo County, sheltering provides, on the average, only about a 10 percent dose reduction from complete exposure. PG&E Ex. 75A, p. 5.^{17/} Evacuation, of course, if

^{17/} Sheltering ranges in effectiveness depending, inter alia, upon the kind of structure and whether there is a basement. To be conservative, a minimal 10 percent reduction factor for sheltering is appropriate. Id.



implemented and completed before the radiation arrives, provides complete dose protection. Given the small benefits of sheltering, evacuation must be viewed as the preferred protective action, particularly if implemented early enough in an accident event.

9. The County intends to evacuate beach and State park areas close to Diablo Canyon at the Alert level. PG&E Ex. 80, Table I.4-4; Tr. 12,511 (Ness).

10. PG&E has installed equipment to monitor the quantity and quality of radioactive releases from the plant. The testimony indicates, however, that there is a relatively large degree of uncertainty in the accuracy of the each step in the sampling, assessment and monitoring equipment, with errors ranging from 5-10 percent to as much as 50 percent. Tr. 11,951-59 (PG&E Panel 5).

B. Discussion and Conclusions

The County's plans and procedures for the use of sirens and radio broadcasts to alert the public are not adequate. The Diablo Canyon plant cannot be licensed unless the NRC finds, among other things, that an effective and comprehensive public information program can and will be instituted. If there is a basis for the public to have confidence in that public information program, there would be no reason to believe that the early sounding of the sirens and commencement of radio broadcasts could do anything but enhance the safety of the public in the event of an emergency. Indeed, sounding the sirens would make people aware of the possible need to take protective actions on



relatively short notice. This would allow persons to stay tuned to radios and, if prudent, to make preliminary arrangements to gather their families and necessary supplies in the event of evacuation.

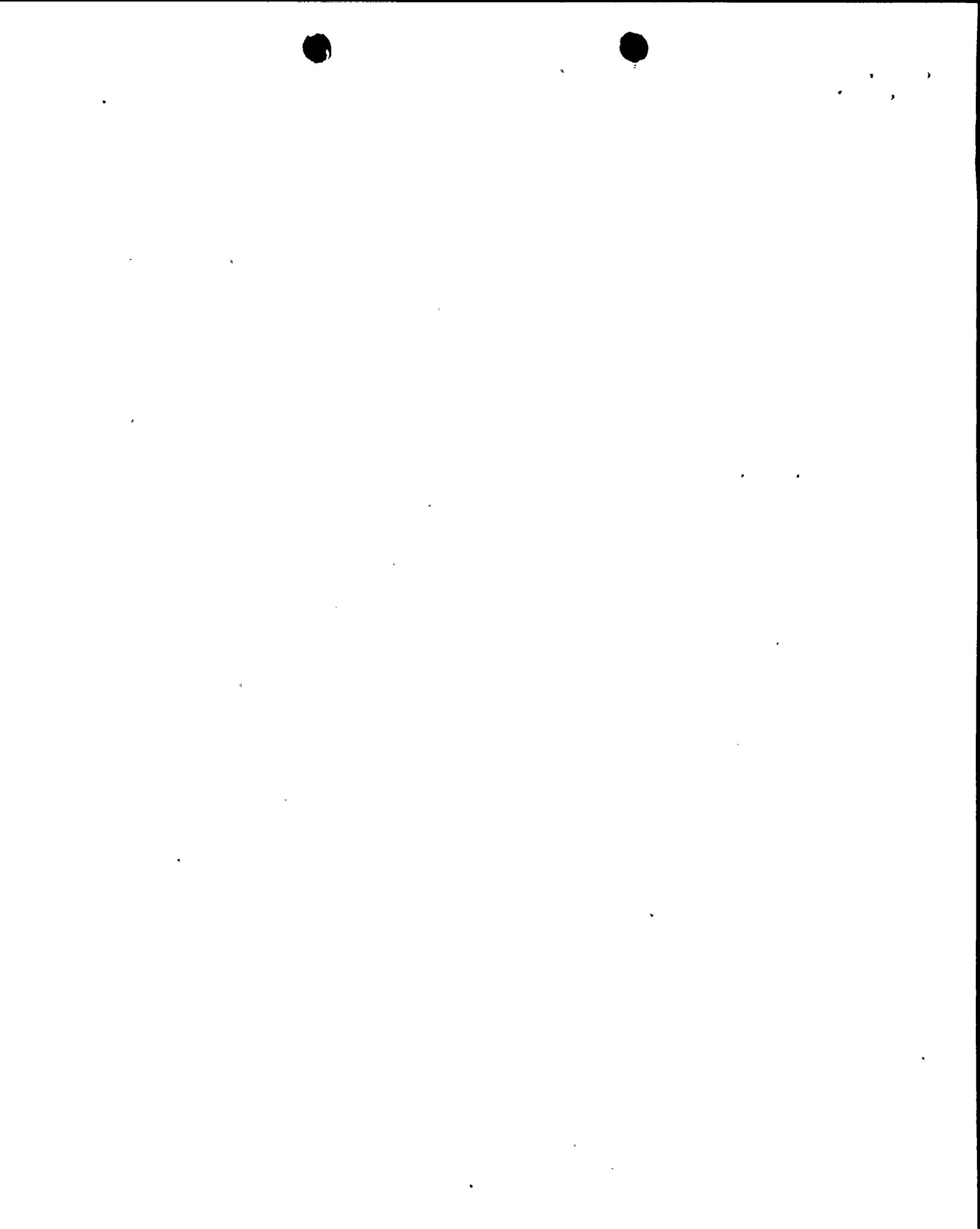
The early sounding of sirens would also aid evacuation itself, because the public would already have received preliminary notification and would be ready to act promptly. This is particularly important in San Luis Obispo County where evacuation is preferred over protective sheltering, which would reduce doses to the public by merely 10 percent. Such a small reduction in radioactive doses should caution the County and this Board that sheltering should be the preferred protective action only if evacuation is infeasible. Accordingly, this Board should find that the present plans for use of the sirens to notify the public fail to meet the standard of 10 C.F.R. 50.47.

IX. EMERGENCY PREPAREDNESS AT DIABLO CANYON IS INADEQUATE BECAUSE PLANNING DOES NOT EXTEND INTO SANTA BARBARA COUNTY

A. Findings of Fact

1. Emergency preparedness for a radiological accident at Diablo Canyon is planned to extend beyond San Luis Obispo County into the northern portion of Santa Barbara County. However, there is presently no preparedness in Santa Barbara County. Indeed, the Santa Barbara County emergency plan will not be completed until mid-1982. Tr. 11,940 (Silver); 12,041 (Skidmore); 12,464-65 (Ness); State Plan, App. C to PG&E Emergency Plan.

2. The failure to assure that there is adequate planning and preparedness within Santa Barbara County is a fatal



flaw in Diablo Canyon emergency planning, because the State of California found -- following year-long radiological emergency planning studies mandated by the Legislature -- that planning and preparedness are required for certain areas of northern Santa Barbara County. See Gov. Brown Ex. 8, pp. 48 et seq. See also Section 8610.5 of the California Government Code.

3. There are rational technical bases for California's requirement that there be emergency planning within the plume exposure zone that extends into Santa Barbara County. Gov. Brown Ex. 8.

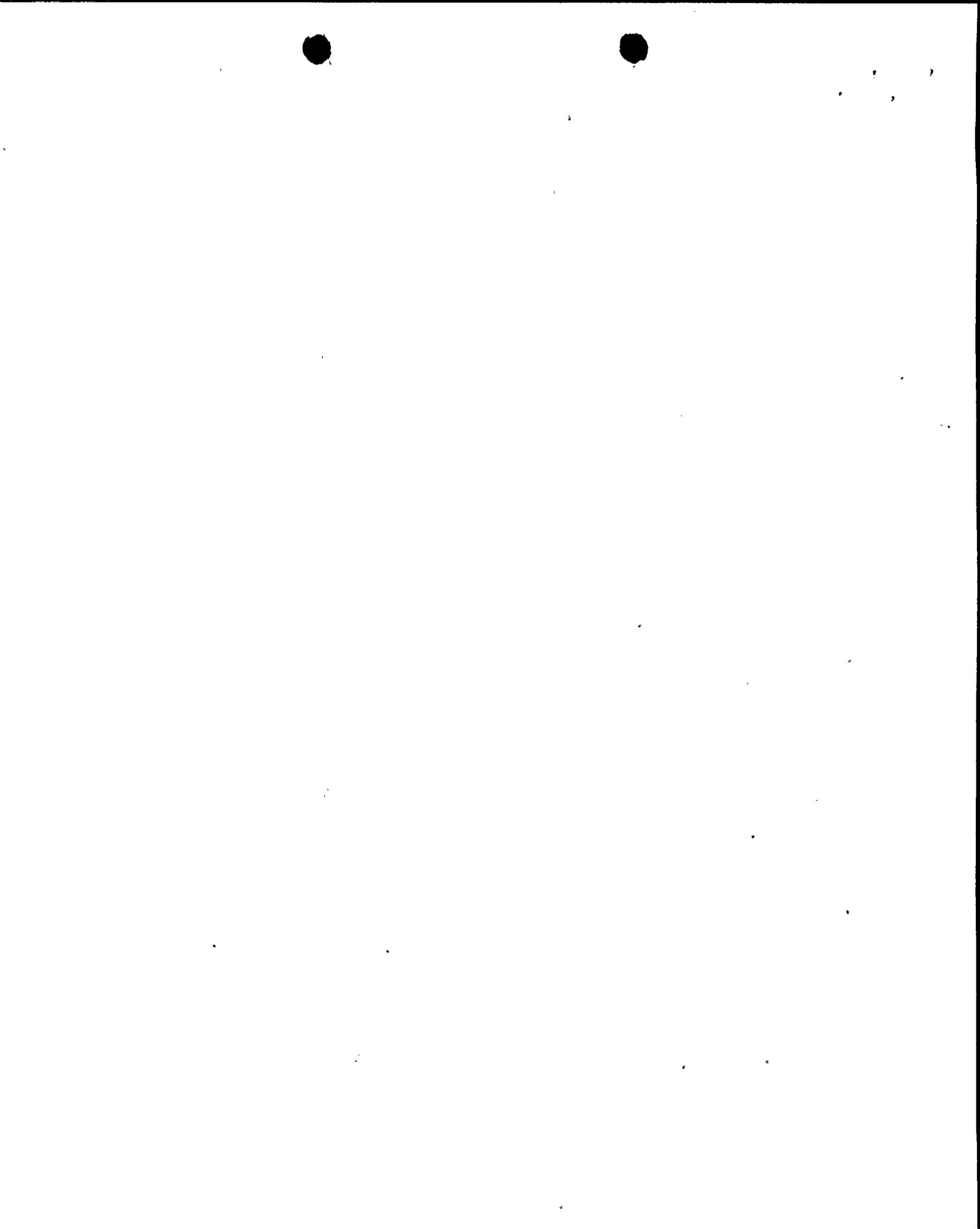
4. There is no integrated off-site preparedness at Diablo Canyon since the Santa Barbara County planning effort has not proceeded. Indeed, even the coordination with Santa Barbara County called for in the San Luis Obispo County Plan has not taken place. PG&E Ex. 80, at I.1(4).

5. Accordingly, the Board finds that emergency planning and preparedness at Diablo Canyon are inadequate because:

(a) Such planning and preparedness at Diablo Canyon do not conform to the requirements of the State's emergency planning zones;

(b) The NRC is bound to take cognizance of State emergency preparedness laws and requirements in ruling on the adequacy of emergency planning and preparedness at Diablo Canyon; and

(c) Operation of Diablo Canyon in the absence of a Santa Barbara County emergency plan would imperil the health and safety of the public.



B. Discussion and Conclusions

California legislation, which requires the establishment of State emergency planning zones (Section 8610.5), mandates that the State identify areas likely to be affected by a nuclear power plant accident. In July 1980, the State Office of Emergency Services released a comprehensive study of consequences of serious accidents at all of California's nuclear power plants. Included therein were recommended emergency planning zones for each plant that were published for comment by the public, utilities and counties. Changes reflecting such comment were then made and the resulting emergency planning zones were adopted in order to ensure meaningful protection of the public affected by potential nuclear accidents.

The emergency planning zones developed for Diablo Canyon through the foregoing process resulted in the requirement that there be plume exposure planning for a Diablo Canyon emergency to a distance of about 25 miles to the southeast of the plant -- that is, to areas within the boundaries of Santa Barbara County. In view of this State requirement, Santa Barbara County is in the process of developing an emergency plan. However, that plan will not be completed and readied for implementation later in 1982.

Until emergency planning and preparedness are completed in Santa Barbara County, this Board cannot find that there is adequate emergency planning at Diablo Canyon. A finding to the contrary by the Board would not only conflict with the indisputable fact that there is no emergency plan or preparedness in



Santa Barbara County, but it would be legally unsound by failing to embrace the emergency planning zone requirements of State law which are clearly within the State's authority and consistent with Section 274 of the Atomic Energy Act.

CONTENTION 10: PRESSURIZER HEATERS

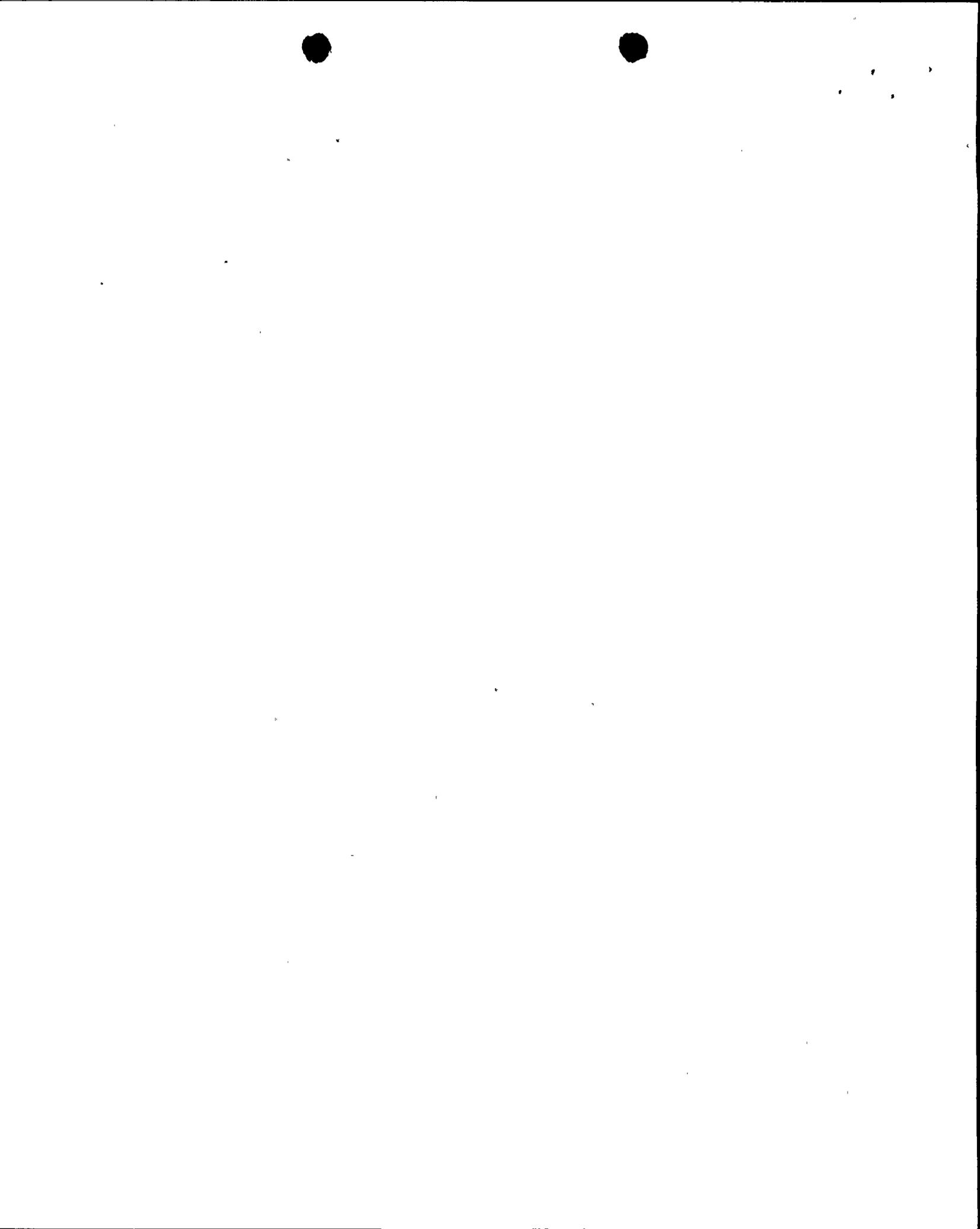
The Staff recognizes that pressurizer heaters and associated controls are necessary to maintain natural circulation at hot stand-by conditions. Therefore, this equipment should be classified as "components important to safety" and required to meet all applicable safety-grade design criteria, including but not limited to diversity (GDC 22), seismic and environmental qualification (GDC 2 and 4), automatic initiation (GDC 20), separation and independence (GDC 3 and 22), quality assurance (GDC 1), adequate, reliable on-site power supplies (GDC 17) and the single failure criterion. The Applicant's proposal to connect two out of four emergency power supplies does not provide an equivalent or acceptable level of protection.18/

A. Findings of Fact

1. Safety-related structures, systems and components are required for the safety functions identified in Section III.C of Appendix A to 10 C.F.R. Part 100. These functions are those necessary to assure:

- (1) The integrity of the reactor coolant pressure boundary;
- (2) The capability to shut down the reactor and maintain it in a safe shutdown condition; or

18/ With respect to Contention 10, Messrs. John B. Hoch, Robert A. Young and Glenn E. Lang presented evidence on behalf of PG&E, Mr. Walton L. Jensen, Jr. testified on behalf of the NRC Staff, and Messrs. Dale G. Bridenbaugh and Gregory C. Minor presented testimony on behalf of Governor Brown. Joint Intervenors presented no direct testimony, but did conduct cross-examination.



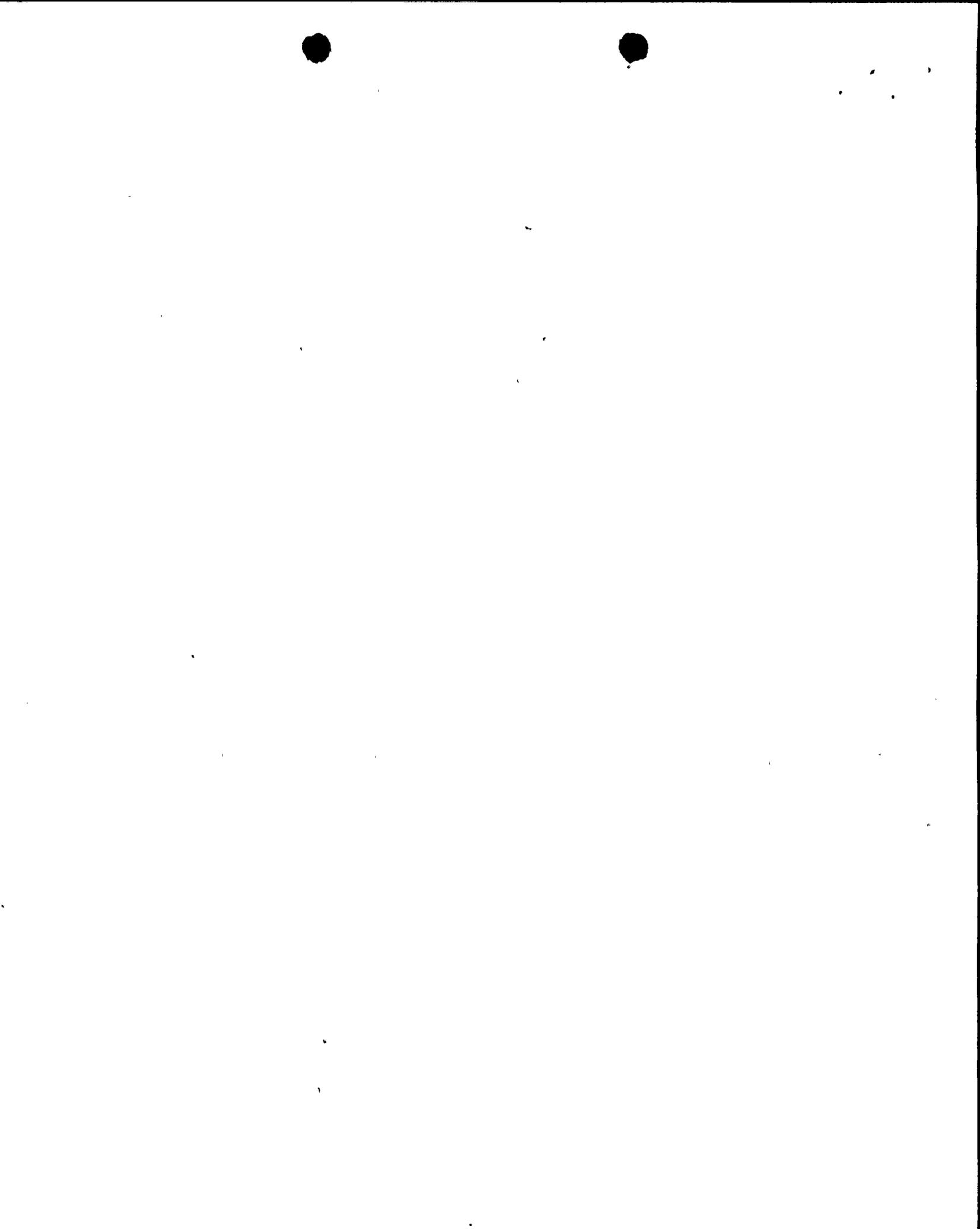
- (3) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to the guideline exposures of 10 C.F.R. Part 100.

Hoch Contention 10 Test. at 2, foll. Tr. 11,550; Jensen Contention 10 Test. at 7, foll. Tr. 11,621.

2. Maintenance of pressure control in the reactor coolant system at Diablo Canyon is normally achieved through the use of the pressurizer heaters. Tr. 11,553 (Hoch). In addition, pressurizer heaters may be used for a variety of applications during both normal and abnormal plant operations. During post-accident conditions, operation of the pressurizer heaters is re-established to restore saturated fluid conditions in the pressurizer after safety injection has been terminated and normal charging and let-down has been restored. Lang Test. at 8, foll. Tr. 11,550. Operation of the pressurizer heaters also is required to maintain primary system pressure in the "hot standby" condition. Jensen Contention 10 Test. at 3, foll. Tr. 11,621.

3. The capability to maintain natural circulation is important to safety. Tr. 11,631 (Jensen). Pressurizer heaters are used in the normal mode to assist in maintaining natural circulation. Lang Test. at 1, foll. Tr. 11,550; Tr. 11,567 (Lang); 11,553 (Hoch); see OP-23, found in PG&E Ex. 74.

4. Under post-accident conditions, with the absence of corrective operator action and loss of pressurizer heaters, the reactor would depressurize and become saturated. Thus, steam bubbles would form in the vessel and loops. With the combined loss of secondary cooling and pressurizer heaters, natural

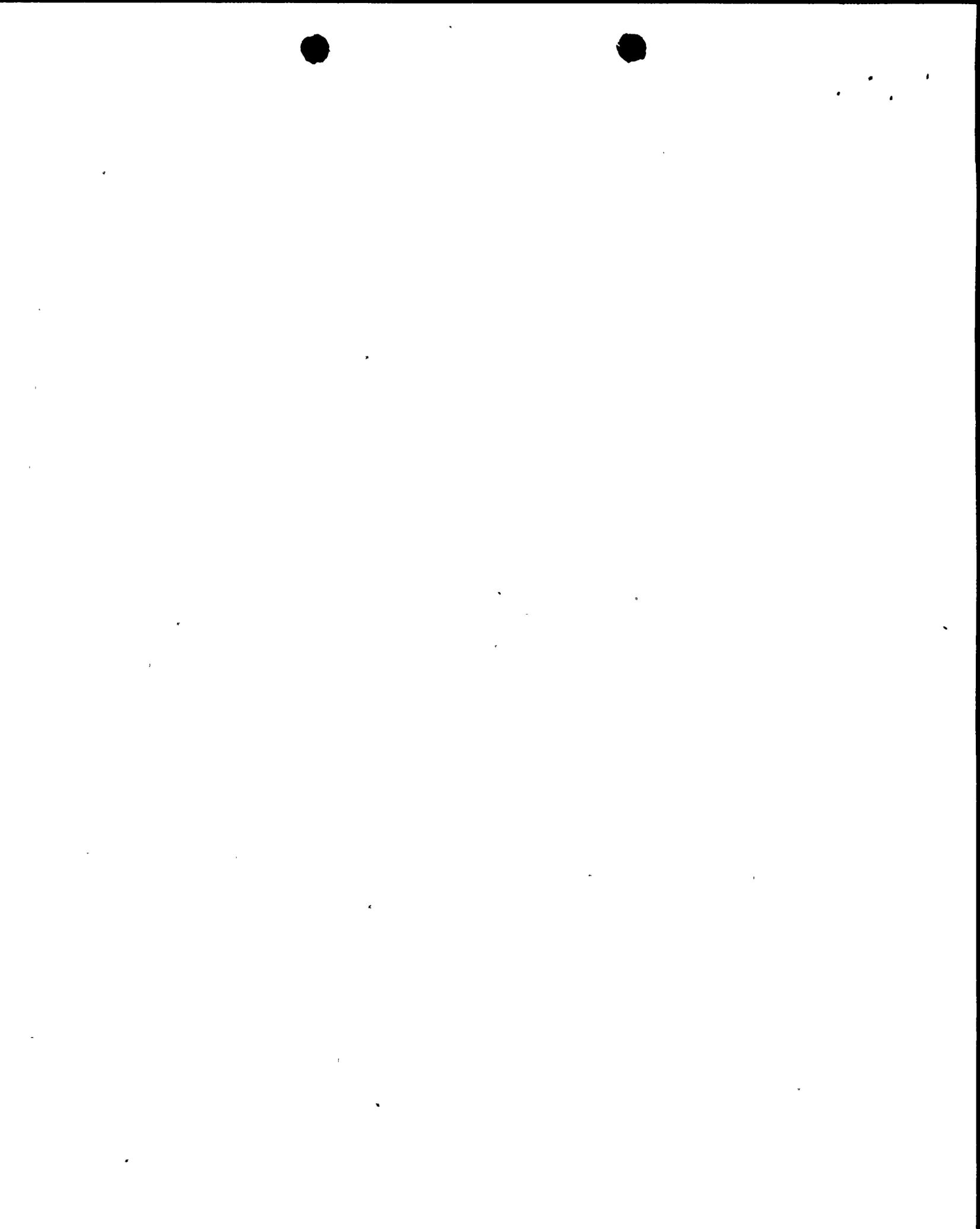


circulation would not occur. Tr. 639-40 (Jensen); 11,690 (Bridenbaugh).

5. Tests at the Sequoyah reactor were cited by PG&E and the Staff as an indication that natural circulation could be achieved at Diablo Canyon if cooling were provided to the secondary side of the steam generators. Jensen Contention 10 Test. at 4, foll. Tr. 11,621; Hoch Contention 10 Test. at 2, foll. Tr. 11,550. However, the Sequoyah tests did not include LOCA conditions, failure of auxiliary feedwater, or failure of the letdown system. Tr. 11,632-22 (Jensen).

6. TMI Requirement II.E.3-1, as clarified in NUREG-0737, specified that the transfer of the pressurizer heater power supply to emergency power is to be accomplished in the control room. NUREG-0737, at 3-86. This is not the case at Diablo Canyon. Bridenbaugh/Minor Contention 10 Test. at 11, foll. Tr. 11,671. Applicant witness Young outlined all of the steps necessary to connect heaters to the emergency power supply, which include an operator being dispatched to a location outside the control room. He thus stated:

When the operator determines that it is necessary to connect the heaters to the on-site emergency power supply, he will, from the control room, attempt to open the circuit breaker that feeds the energy from the off-site power supply by manually turning the control switch on the main board. He will then dispatch someone to go down to the elevation 100 electrical switch gear room. He will then verify that the breaker is open, draw the breaker out which is a relatively simple operation, step into the safety related electrical switch gear room, verify that the safety grade breaker is open, manually throw a transfer switch which is right next to it, rack in the breaker which connects to the vital bus, the emergency on-site power supply, verbally inform the senior



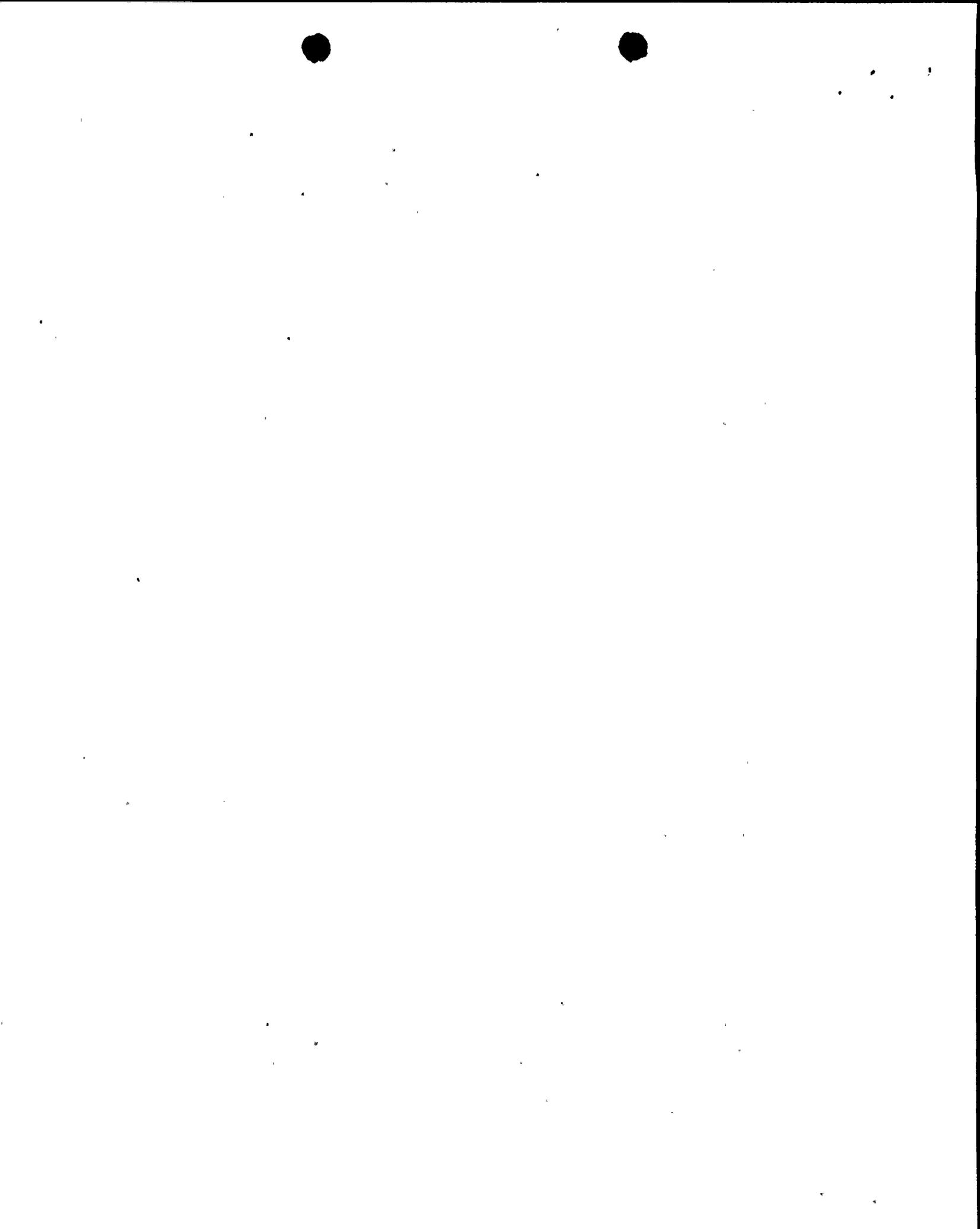
operator or whoever is in charge of the control room, that he can now energize the pressurizer heaters from the emergency vital bus. This step would be done from the main control room.

49. 11,575-76 (Young).^{19/} The NRC witness had not evaluated the impact of personnel having to go to another floor to set up the transfer of pressurizer heater power to the emergency power supply. Thus, he could not justify the Staff position that the foregoing procedure satisfied the NUREG-0737 requirement that the transfer be accomplished from the control room. Tr. 11,645-47 (Jensen).

7. At least nine Diablo Canyon Emergency Operating Procedures ("EOPs") call for use of the pressurizer heater system. Bridenbaugh/Minor Contention 10 Test. at 8, foll. Tr. 11,671. However, the Diablo Canyon EOPs which specify use of the pressurizer heaters do not specify alternates to the use of pressurizer heaters or other pressure control methods to use in the event the heaters are or become unavailable. Bridenbaugh/Minor Contention 10 Test. at 5, 8-9, foll. Tr. 11,671; Tr. 11,551 (Patterson); 11,686-98 (Minor/Bridenbaugh). Rather, an operator at Diablo Canyon must rely on his knowledge and training, not specific EOP references, to know what to do if the heaters become unavailable.

8. For example, OP-13, entitled "Malfunction of reactor Pressure Control System," does not direct the operator to

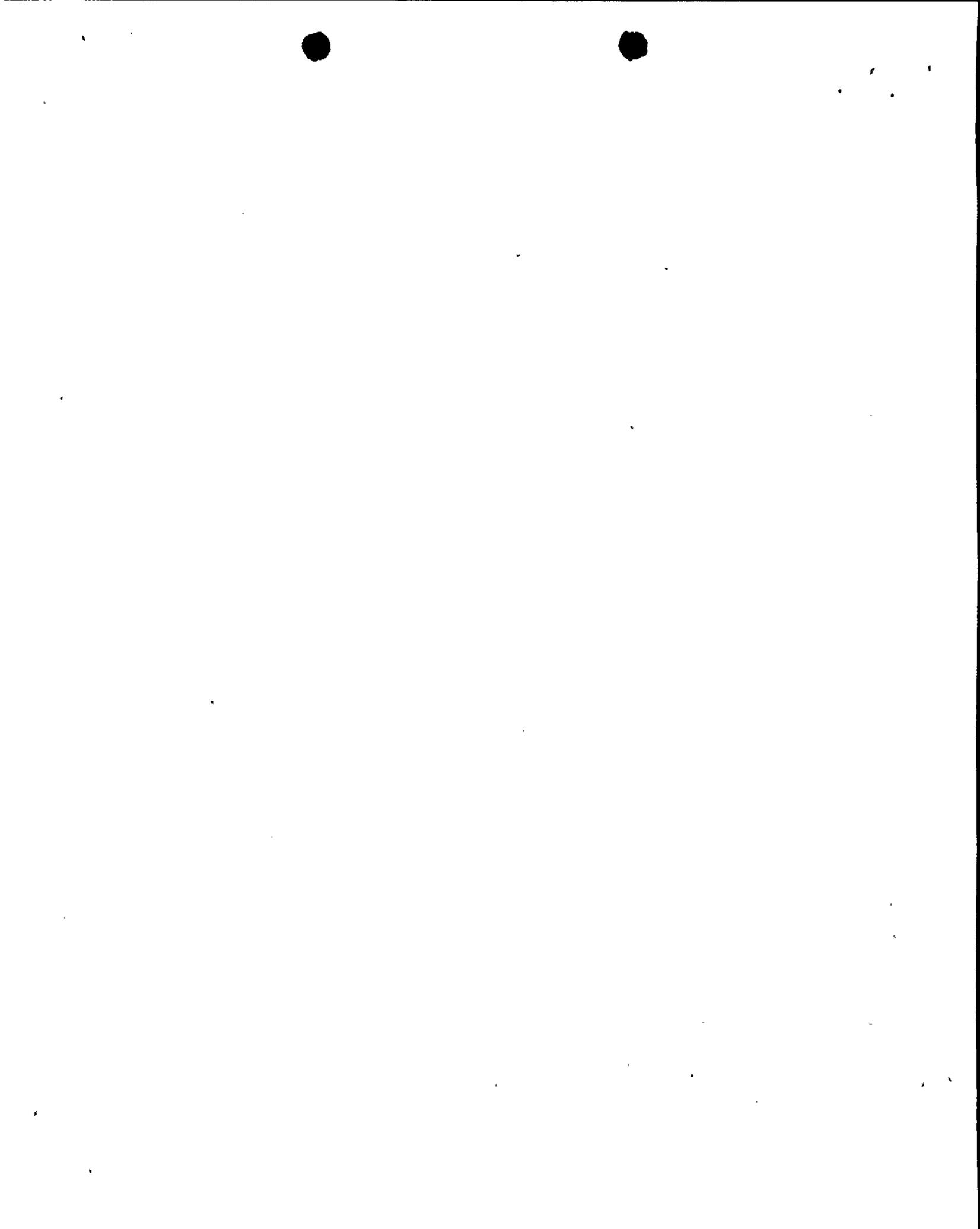
^{19/} The pressurizer heaters at Diablo Canyon are a non-class IE system and it is not common to connect safety grade power supply to non-safety grade equipment. However, this is the configuration used to power the pressurizer heaters at Diablo Canyon. Tr. 11,576 (Young).



use other systems or other safety-grade equipment to effect pressure control under circumstances where manual control of the pressurizer heater system is not successful. See PG&E Ex. 74. Similarly, OP-23, entitled "Natural Circulation of Reactor Coolant," does not specify how to maintain natural circulation by using the normal charging and letdown system or the safety grade high head safety injection system. Tr. 11,555 (Fridley); see PG&E Ex. 74.^{20/} In the event of failure of the pressurizer heater system, OP-23 does not direct the operator what equipment to use but rather the "operator's general training would have him do that." Tr. 11,558, 11,566 (Fridley); 11,723 (Minor). However, good practice in the design of procedures is to specify what steps are to be followed and what components are to be used, rather than simply relying on the supposed training or judgment of a particular operator. Tr. 11,583 (Patterson); 11,689-90, 17,723-24 (Minor/Bridenbaugh).

9. The purpose of classifying structures and components as safety-related is to attempt to ensure greater reliability. PG&E considers pressurizer heaters as "important to safety." Tr. 11,561 (Hoch). However, PG&E agrees that pressurizer heaters are "safety-related" with regard to ensuring the integrity of the reactor coolant system boundary. Tr. 11,561-62 (Hoch).

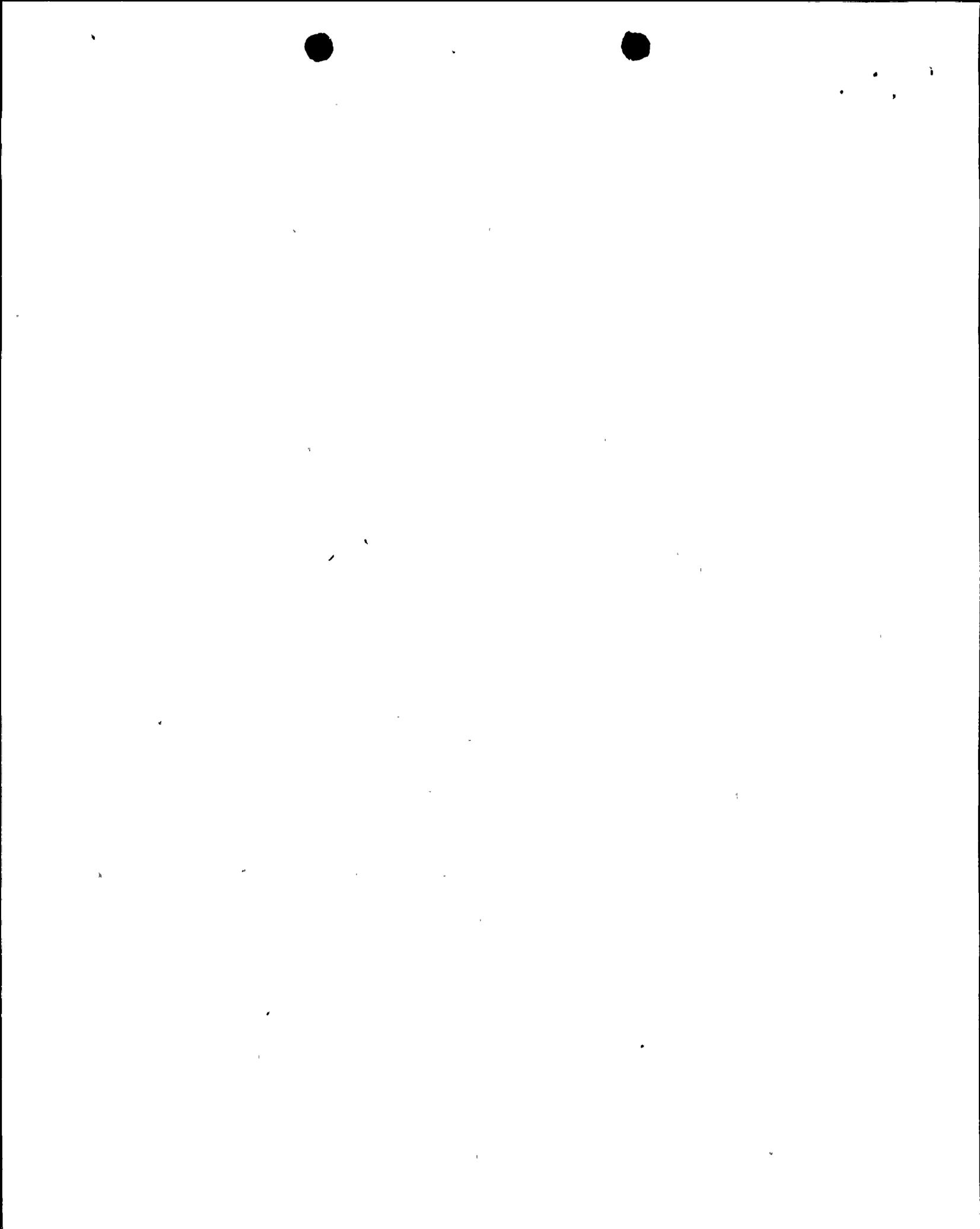
^{20/} It was stated at the hearing that PG&E operators would use the charging and letdown system or the safety grade high head injection system if the pressurizer heaters were unavailable. Hoch Contention 10 Test. at 2, foll. Tr. 11,550. The cited procedures do not direct operators to take such action.



10. While PG&E has not classified the pressurizer heaters as safety-related, PG&E's witness Lang stated that there is no reason not to have the pressurizer heaters safety-grade. Tr. 11,567 (Lang). Moreover, one NRC Staff Study Group recommended that the pressurizer heater system should be classified as safety-grade which would help to ensure emergency power availability and protection from failures due to environmental conditions. Tr. 11,637 (Jensen).

11. The NRC Lessons Learned Task Force found that maintenance of natural circulation capability is important to safety. The pressurizer heater system is the normal and preferred system for this capability and is the primary means relied upon at Diablo Canyon to achieve natural circulation. Bridenbaugh/Minor Contention 10 Test. at 4, foll. Tr. 11,671.

12. It is technologically feasible to make the Diablo Canyon pressurizer heaters safety grade. To accomplish this change, PG&E would need new raceway systems, new qualified cable, a new electrical penetration of the containment, and the heaters would need to be seismically qualified. In addition, the control system for the heaters would need to be upgraded. Tr. 11,573-74 (PG&E Panel). There is no safety disadvantage to improving pressurizer heaters to safety grade but there may be an economic disadvantage. Tr. 11,643 (Jensen); 11,567 (Lang). If safety classification upgrading were to be required, the pressurizer heater system should become more reliable. Bridenbaugh/Minor contention 10 Test. at 12, foll. Tr. 11,671.



B. Discussion and Conclusions

The testimony regarding Contention 10 revealed several interrelated facts:

- There is no express requirement of the NRC's regulations that the Diablo Canyon pressurizer heaters be classified as safety-grade. Rather, licensees such as PG&E must choose which equipment shall be relied upon in critical situations and give such equipment the highest safety classification.
- PG&E chose not to classify the pressurizer heaters as safety-grade. However, it is clear that the heaters play a crucial role in responding to accident and transient conditions requiring pressure control. Indeed, with respect to establishing natural circulation -- a clearly essential function in light of the TMI accident -- the use of the heaters is the normal and preferred mode of maintaining necessary pressure conditions.
- PG&E's EOPs do not clearly specify necessary operator actions to take in the event the pressurizer heaters are unavailable. Rather, PG&E relies on general operator knowledge and training to ensure that correct actions are taken. This is unacceptable since in accident or transient situations, the directions to operators should be clear and explicit.
- It is feasible to make the heaters safety grade. There would be no safety disadvantage to such an upgrade.



Indeed, the only drawback appears to be the potential costs. Those costs may not be high since it is possible that the heaters could be made safety grade without physical changes. Tr. 11,575 (Hoch). However, no evidence was presented to suggest that the costs would be too high in light of the clear resulting benefits.

In light of the foregoing, this Board should reach the following conclusions:

1. PG&E's EOPs are inadequate for failing to specify clearly the actions to be taken in the event the pressurizer heaters are or become unavailable. Accordingly, the Board should require that PG&E revise its EOPs to rectify this deficiency.

2. The evidence demonstrates that substantial safety benefits would be realized by upgrading the pressurizer heaters to safety grade. Accordingly, the Board should require such upgrading.

CONTENTION 12 AND CLARIFIED COMBINED CONTENTIONS 8 AND 9:
POWER OPERATED RELIEF VALVES

Proper operation of power operated relief valves, associated block valves and the instruments and controls for these valves is essential to mitigate the consequences of accidents. In addition, their failure can cause or aggravate a LOCA. Therefore, these valves must be classified as components important to safety and required to meet all safety grade design criteria.

Relief and Block Valves. Joint Intervenors contend that the present classification of Diablo Canyon relief valves and associated block valves, instruments and controls does not comply with 10 CFR 50, Appendix A, Reg Guide 1.26 and SRP (Reg Guide 1.70), Section 3.22. Joint Intervenors also contend that General Design Criteria 1, 14, 15 and 30 are violated because relief and block valves have not been qualified under all transient and accident conditions.

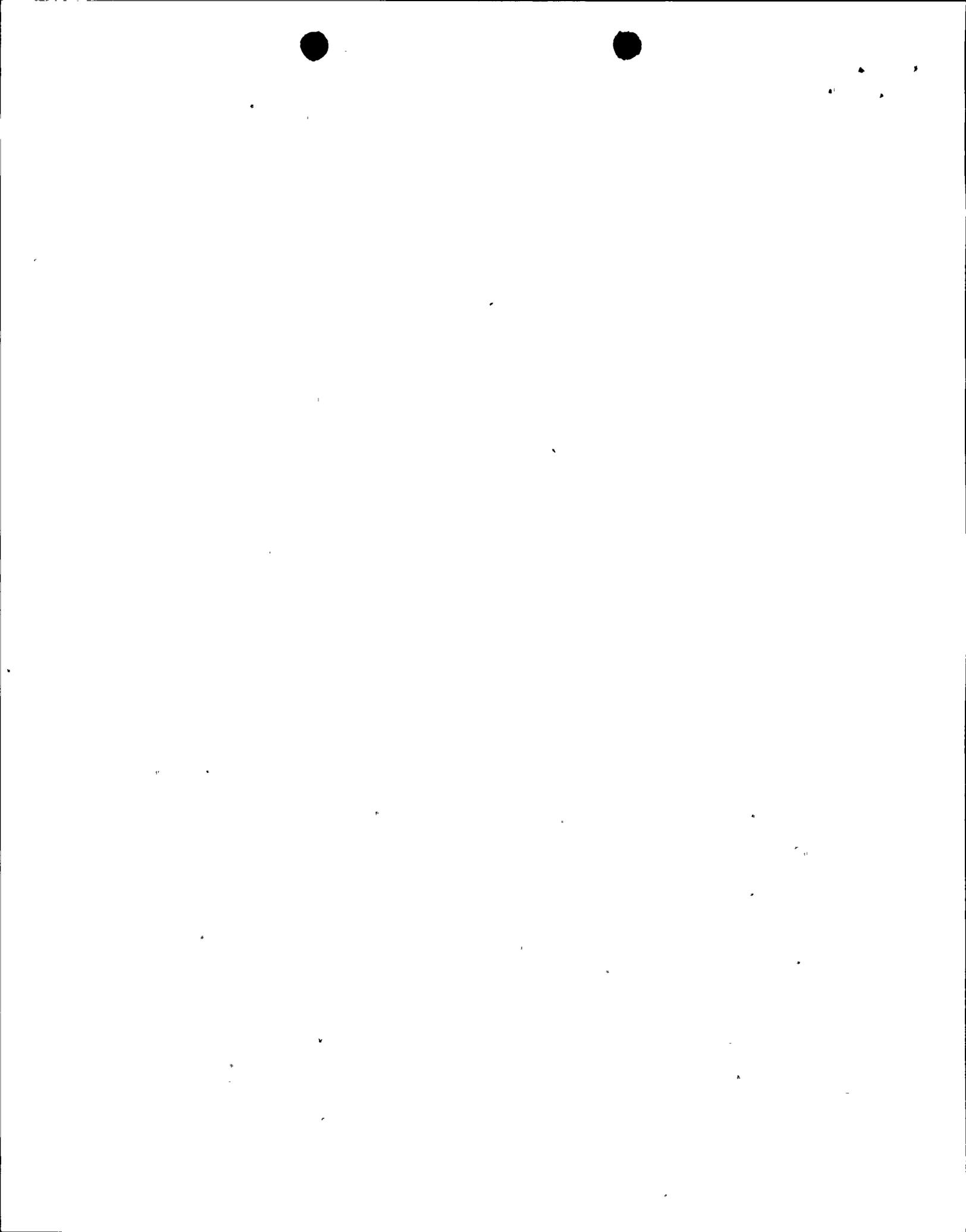


Proper operation of power operated relief valves, associated block valves and the instruments and controls for these valves is essential to mitigate the consequences of accidents. The TMI accident demonstrated this fact. In addition, their failure can cause or aggravate a LOCA. Therefore, these valves must be classified as components important to safety and required to meet all safety-grade design criteria. However, the Diablo Canyon block and relief valves do not meet all safety-grade design criteria, in violation of the regulatory practices listed above. In addition, reactor coolant system relief valves form part of the reactor coolant system pressure boundary. When relief valve operation is unreliable, series block valves are relied upon to maintain the integrity of the pressure boundary. Despite these important safety functions, appropriate qualification testing has not been done to verify the capabilities of these block valves to function during normal, transient and accident conditions. In the absence of such testing and verification, the public health and safety are endangered.21/

A. Findings of Fact

1. The Diablo Canyon plant includes 3 PORV's and 3 associated block valves. Two of the PORV's are classified by PG&E as "important to safety" and the third is not, having been added to provide capability for 100 percent load rejection without reactor trip. The three block valves are also classified by PG&E as "important to safety." (There is confusion in the terminology used by PG&E in referring to safety classification. Although inconsistent with the classification in the FSAR (e.g., FSAR p. 3.2-1), PG&E's use of the term "important to safety"

21/ With respect to Contention 12, Messrs. John B. Hoch, Thomas N. Crawford, Edward M. Burns, Robert M. Grayson and Raymond J. Skwarek presented evidence on behalf of PG&E, Mr. Walton L. Jensen, Jr. testified on behalf of the NRC Staff, and Messrs. Dale G. Bridenbaugh and Gregory C. Minor presented testimony on behalf of Governor Brown. Joint Intervenors presented no direct testimony, but did conduct cross-examination.



should read "safety-related.") Bridenbaugh/Minor Contention 12 Test. at 4, foll. Tr. 11,671; Tr. 11,601, 11,603, 11,611-12 (Hoch); Hoch Contention 12 Test. at 4, foll. Tr. 11, 590.

2. The PORV's and/or block valves perform several functions which have safety significance consistent with one or more of the definitions of safety-related devices. These functions are:

- a. Maintain integrity of the primary pressure boundary.
- b. Provide pressure relief for low temperature overpressurization conditions.
- c. Reduce the number of challenges to the safety valves.
- d. Reduce the number of challenges to the ECCS.
- e. Provide a bleed capability during the feed-and-bleed mode of operation to remove decay heat from the core.

Bridenbaugh/Minor Contention 12 Test. at 4, foll. Tr. 11,671.

3. The PORV's and block valves serve both active and passive functions. As a passive device, they are part of the reactor pressure boundary and must function correctly to prevent leaks. General Design Criterion 14 requires that the reactor coolant pressure boundary be designed to maintain a leak-tight configuration. This may be accomplished with a higher reliability if the PORV's and their controls are classed as safety-related. Tr. 11,652-54 (Jensen). As an active device, the proper actuation of the PORV's can prevent the need for lifting the safety valves. By opening to reduce pressure in the reactor, the PORV's can reduce challenges and unnecessary openings of a safety valve. This is important because there is



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no way manually to reclose a safety valve should it become open. Tr. 11,600-01 (Hoch).

4. Failure to maintain the integrity of the pressure boundary due to a failed open PORV was a direct contributor to the accident at TMI-2. Tr. 11,591 (Skwarek). However, the analyses at Diablo Canyon do not include the TMI-2 accident sequence, and the Westinghouse analysis for Diablo Canyon, which indicates that PORV failure would not result in core uncovering, was limited by the assumption of no incorrect operator actions. Tr. 11,595-97 (Skwarek).

5. Testing and qualification of the Diablo Canyon PORV's and block valves are incomplete because the controls and structures have not been analyzed with a Diablo Canyon site-specific analysis. Tr. 11,598 (Burns). Further, the block valves have been tested only under steam conditions and there are no plans for water tests of these valves. Id.

6. The block valves and/or PORV's are called upon to be operated or checked for misoperation in several of the Diablo Canyon EOPs. For example, OP-20, entitled "Excessive Reactor Coolant System Leakage," calls for checking the PORV's as a possible source of excessive leakage from the coolant system (i.e., a small LOCA). OP-38, entitled "Anticipated Transient Without Trip," describes the need for automatic opening of the PORV's and checking later to see that they are not stuck open in the event of a pressure decay and coolant loss. OP-2, entitled "Loss of Secondary Coolant," describes the actions necessary to prevent challenges to the pressurizer safety valves in the case

of loss of secondary coolant. It also mentions that the transient may cause the PORV's to open and requires that their resetting be checked, thus ensuring against a small LOCA in the primary coolant. However, the Diablo Canyon EOPs do not differentiate between the safety and non-safety grade PORV's. Thus, operators performing critical functions may rely upon less reliable equipment. Bridenbaugh/Minor Contention 12 Test. at 5, foll. Tr. 11,671; Tr. 11,607 (Patterson); PG&E Ex. 74.

7. The reliability of the block valves and PORV's is still in question despite testing and qualification efforts by EPRI and the Westinghouse Owners Group. In fact, since October 1980, one block valve manufactured by Velan, the same model as utilized at Diablo Canyon, has failed. Tr. 11,618 (Grayson).

8. Additional safety importance is placed on the PORV's at Diablo Canyon for low-temperature over-pressurization protection. PORV's are now called upon to serve this safety-related function, but only two of the three Diablo Canyon PORV's are capable of providing the protection. Long-term resolution of this issue by the NRC may also involve use of PORV's. Tr. 11,649-50 (Jensen).

B. Discussion and Conclusions

The testimony established that the Diablo Canyon PORV and block valve system is in many respects superior to that at TMI-2 where a failed PORV contributed significantly to the accident. For example, five of the six valves at Diablo Canyon are safety grade.

PG&E has justified failure to classify one of the six valves as safety grade on the basis that analyses show that failure of that valve cannot lead to core uncover. This position assumed that other failures or, more important, inappropriate operator actions, do not occur. The TMI accident demonstrated, however, other failures or operator errors do in fact occur. Thus, consistent with eliminating potential failure mechanisms that can lead to upset conditions, there appears to be no sound basis for not qualifying the last PORV to safety-grade standards. Indeed, this could be done simply by adding a safety-grade power source and additional circuitry to the third PORV. Tr. 11,606 (Crawford). This clearly is feasible, as demonstrated by the fact PG&E has already done this with the other two PORV's. The Board should require that such safety upgrade be accomplished by PG&E.

CONCLUSION

For the foregoing reasons, PG&E has failed to satisfy the NRC's regulations governing emergency planning and preparedness, block and relief valves, and pressurizer heaters. Accordingly, Governor Brown respectfully requests that this Board deny PG&E's application for a license to operate the Diablo Canyon plant.

Respectfully submitted,

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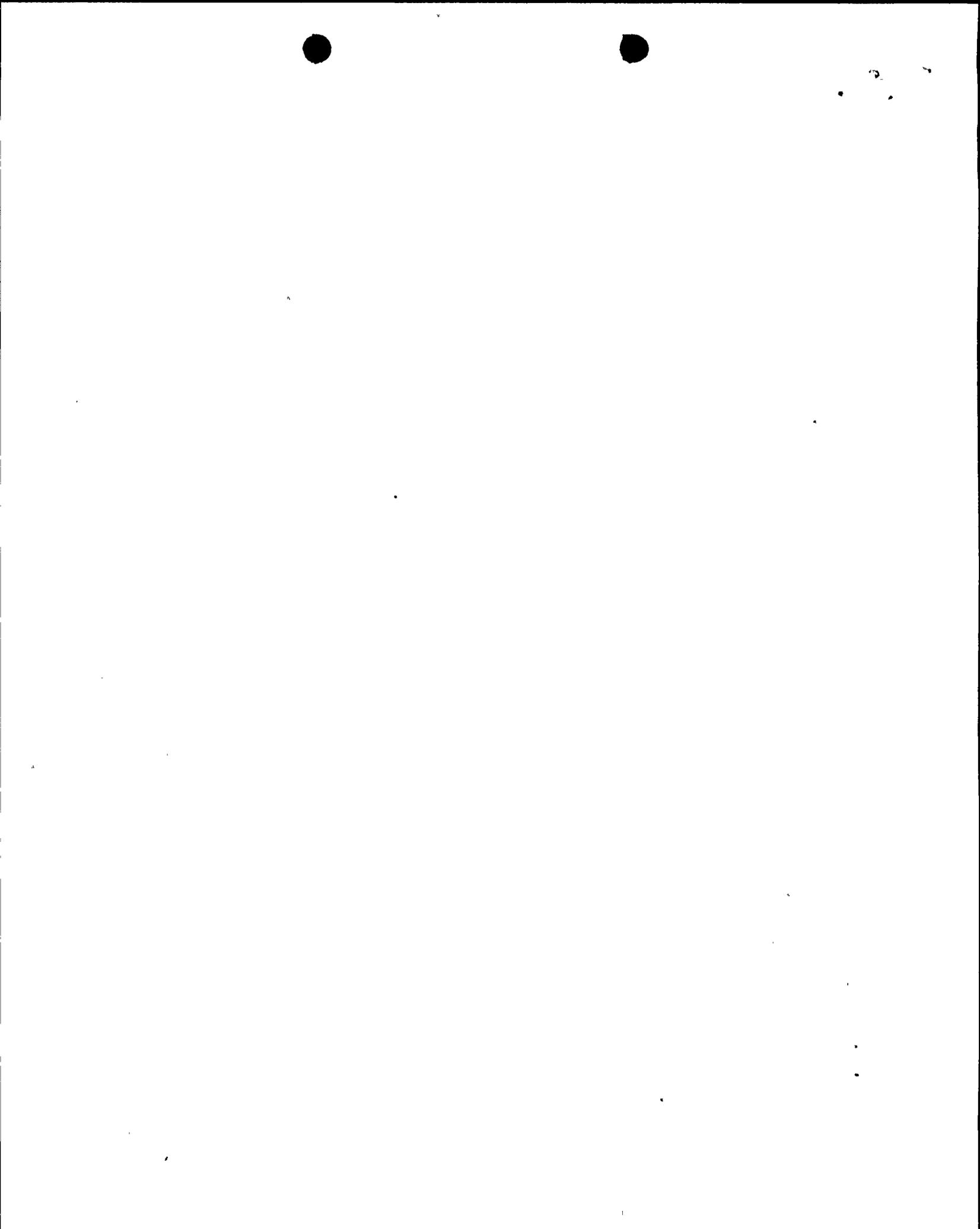


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March 19, 1982



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)

PACIFIC GAS AND ELECTRIC COMPANY .)

(Diablo Canyon Nuclear Power)
Plant, Unit Nos. 1 and 2))

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

CERTIFICATE OF SERVICE

I hereby certify that copies of the "BRIEF OF PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW SUBMITTED ON BEHALF OF GOVERNOR EDMUND G. BROWN JR.," dated March 19, 1982 have been served to the following on March 19, 1982 by U.S. Mail, first class.

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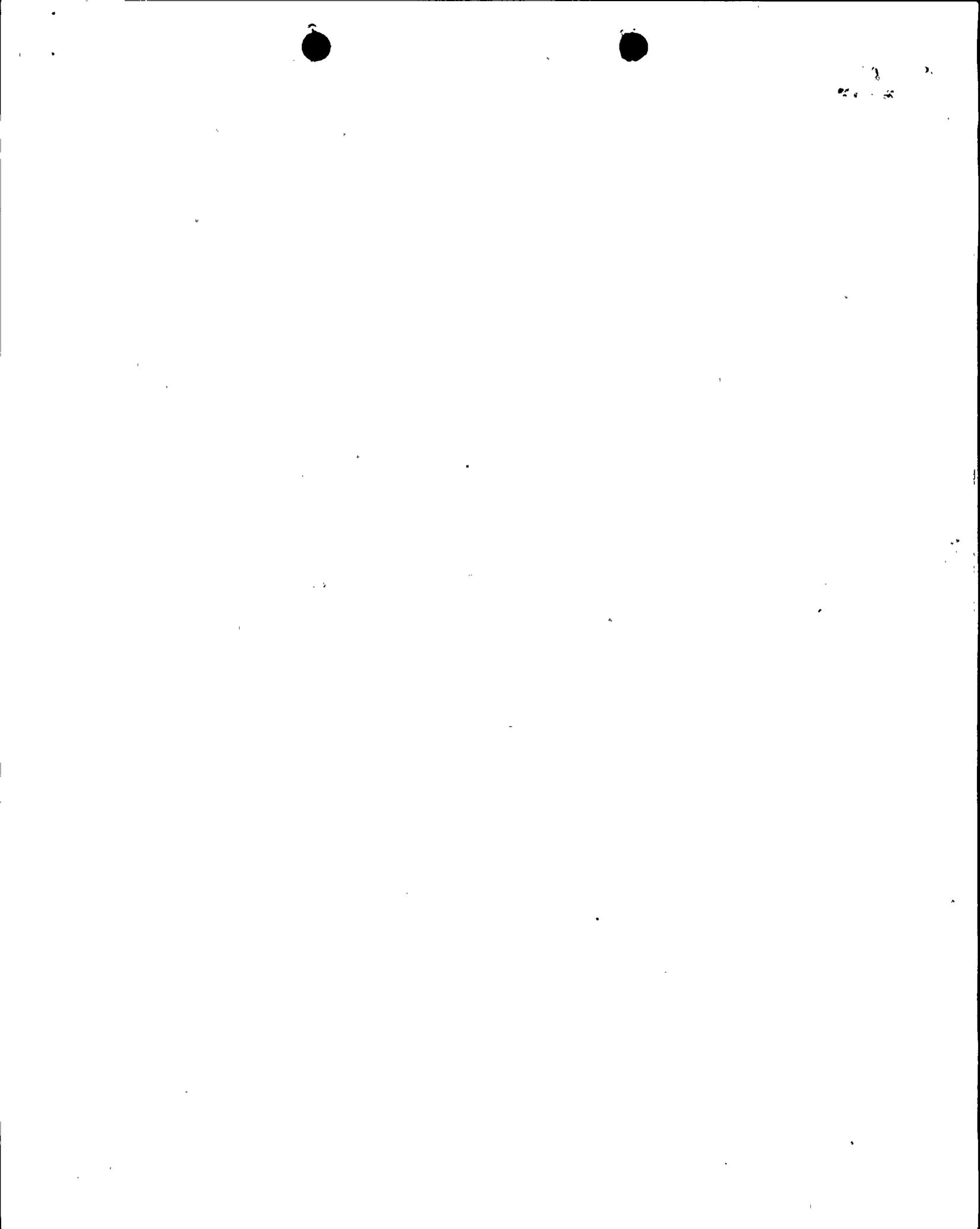
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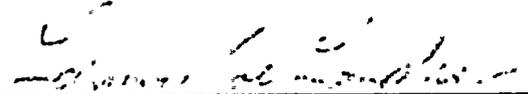
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CF
 Order that Commission has decided that word 'several' as used in design basis threat of 10CFR73.1(a)(1)(i) does not warrant review within context of proceeding.

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PDR DS02
 Order CLI-82-7 deciding that definition of 'several' does not warrant Commission review in context of proceeding. Commission will re-evaluate design basis threat generically.

