



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

OCT 18 1978

Docket Nos: 50-275
and 50-323

APPLICANT: Pacific Gas & Electric Company (PG&E)
FACILITY: Diablo Canyon Nuclear Power Station, Units 1 & 2
(Diablo Canyon)
SUBJECT: SUMMARY OF MEETING HELD ON OCTOBER 12, 1978 TO DISCUSS
SEISMIC QUALIFICATION DIABLO CANYON OF ELECTRICAL EQUIPMENT

We met with the applicant on October 12, 1978 in Bethesda Maryland to discuss seismic qualification of electrical equipment. A list of attendees is provided in Enclosure No. 1.

PG&E was performing a seismic reevaluation of the Diablo Canyon plant to determine what modifications were necessary to upgrade the plant's seismic resistance. As part of this program, numerous items of electrical equipment had been retested at Wyle Laboratories to simulate the newer and more severe seismic design basis.

The purpose of this meeting was to discuss our review of the test results for this equipment. The discussions concerned our review of electrical aspects of the testing - how the equipment performance was monitored during the testing to demonstrate that the required safety functions would be accomplished. Our review of the mechanical aspects of the testing, which involves primarily the type and severity of shaking, was not discussed.

The results of the discussions are summarized in Enclosure No. 2. Of the twenty items discussed, eleven were resolved or the specific actions to obtain resolution were identified. The others remained to be resolved later. PG&E planned to return the following week to discuss these remaining items.

In addition to the discussion of equipment requalification, we provided PG&E our position regarding fault current protection for containment electrical penetrations (Enclosure 3). We indicated that this position followed the precedent that had been established on other recent operating license reviews. We also stated that our precedent allowed until the end of the first fuel cycle to complete installation of the second level of protection as indicated in the license condition from the operating license for D. C. Cook, Unit 2 (Enclosure No. 4). However, we stated that if any situations existed where the first level of protection was not set low enough to protect the penetration, we would want the appropriate modifications completed prior to plant operation.

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Finally, we provided the applicant an informal question concerning the information in Amendment 62 to the FSAR (Enclosure No. 5). This question deals with the seismic qualification of electrical equipment that had not been retested.



Dennis P. Allison, Project Manager
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Enclosures:
As stated

cc:
See next page



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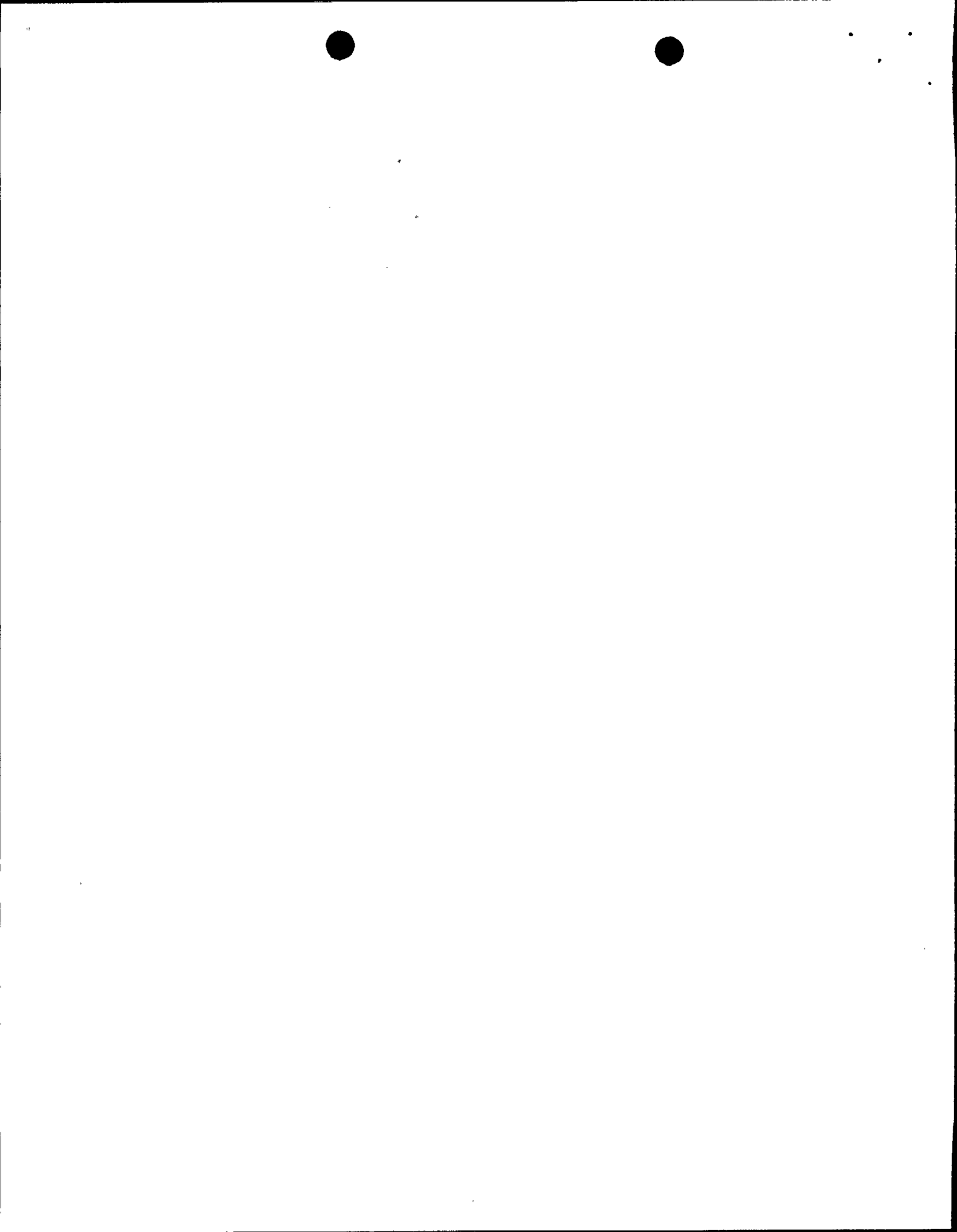
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ENCLOSURE NO. 1

LIST OF ATTENDEES

MEETING WITH PG&E ON OCTOBER 12, 1978

NRC STAFF

J. F. Stolz
F. Rosa
J. Knox
D. P. Allison

PG&E

J. Hoch
R. Young
D. Nielsen
E. Levijoki



ENCLOSURE NO. 2

RESULTS OF DISCUSSION ON OCTOBER 12, 1978

DIABLO CANYON MEETING

The items below pertain to the Power Systems Branch review of equipment that was retested at Wiley Laboratories.

The first 11 items were resolved or the specific options to obtain resolution were identified. The remaining items were not resolved.

1. Battery- Acceptable subject to satisfactory performance on discharge capacity test. This test to be performed after returning the battery cells to the plant.
2. Battery Charger - Acceptable subject to another retest with monitoring of charger voltage and charging current during shaking.
3. 125 Volt DC Distribution Panel - Acceptable subject to:
 - (1) Retest of molded case circuit breakers to confirm that they do not chatter during shaking
 - (2) Confirmation that:
 - (a) The white indicating light was monitored during shaking indicating no loss of power, and
 - (b) The undervoltage relay was monitored with a chatter detector during shaking and did not chatter
4. 125/250 Volt Motor Control Centers - Acceptable subject to another retest of a starting resistance contactor and a main line contactor to confirm that they do not chatter during shaking
5. Local Starters - Acceptable subject to:
 - (1) For the two speed fan starter on page 283 of the Wiley test report:
 - (a) Confirmation that the auxiliary contacts were monitored and did not chatter during shaking, or
 - (b) Submittal of an acceptable justification that the main contacts could not have chattered during shaking, or
 - (c) Submittal of the results of an analysis demonstrating that contact chatter would have no effect on the performance of the starter or the function of other safety loads, or
 - (d) Another retest demonstrating that contact chatter does not occur during shaking.



- (2) Revision of the text of the FSAR description and the Wiley test report to eliminate conflicts.
6. Main control board components - Reviewed and no problems identified. Acceptable unless rereview during SER preparation reveals a previously undiscovered problem.
 7. Ventilation Control Logic - Same as number 6
 8. Ventilation Relay Panel - Same as number 6.
 9. Annunciator - Acceptable
 10. Big Beam Lights - Acceptable
 11. Namco limit switches - Same as number 6.
 12. Safeguard Relay Board - PG&E to respond to staff questions at a meeting the following week.
 13. Diesel Generator Equipment - Same as number 12.
 14. 4 Kilovolt switchgear and potential transformer - Same as number 12.
 15. Vital Load Center, Reversing Starters - Some confusion as to what was monitored and what the results were. PG&E to clarify at a meeting the following week.
 16. Fan Cooler Motor Controllers - Not yet reviewed
 17. Auxiliary Relay Panel - Not yet reviewed
 18. Fire Pump Controllers - Not yet reviewed
 19. Fischer Controller - FSAR description not yet submitted.
 20. Steam Dump Valve Controller - PG&E to check on this item and inform staff of status.



7.2 Containment Integrity: Overcurrent fault protective systems for containment penetrations.

Regulatory Guide 1.63, Revision 1, was classified as a Category II review item by the Regulatory Requirements Review Committee meeting No. 60, March 27, 1977, for all applications not evaluated under Revision 0 to Regulatory Guide 1.63.

Pursuant with this Category II classification, the Diablo Canyon applicant was requested to describe how their penetration design meets Regulatory Guide 1.63, Revision 1.

In this regard the applicant was requested to:

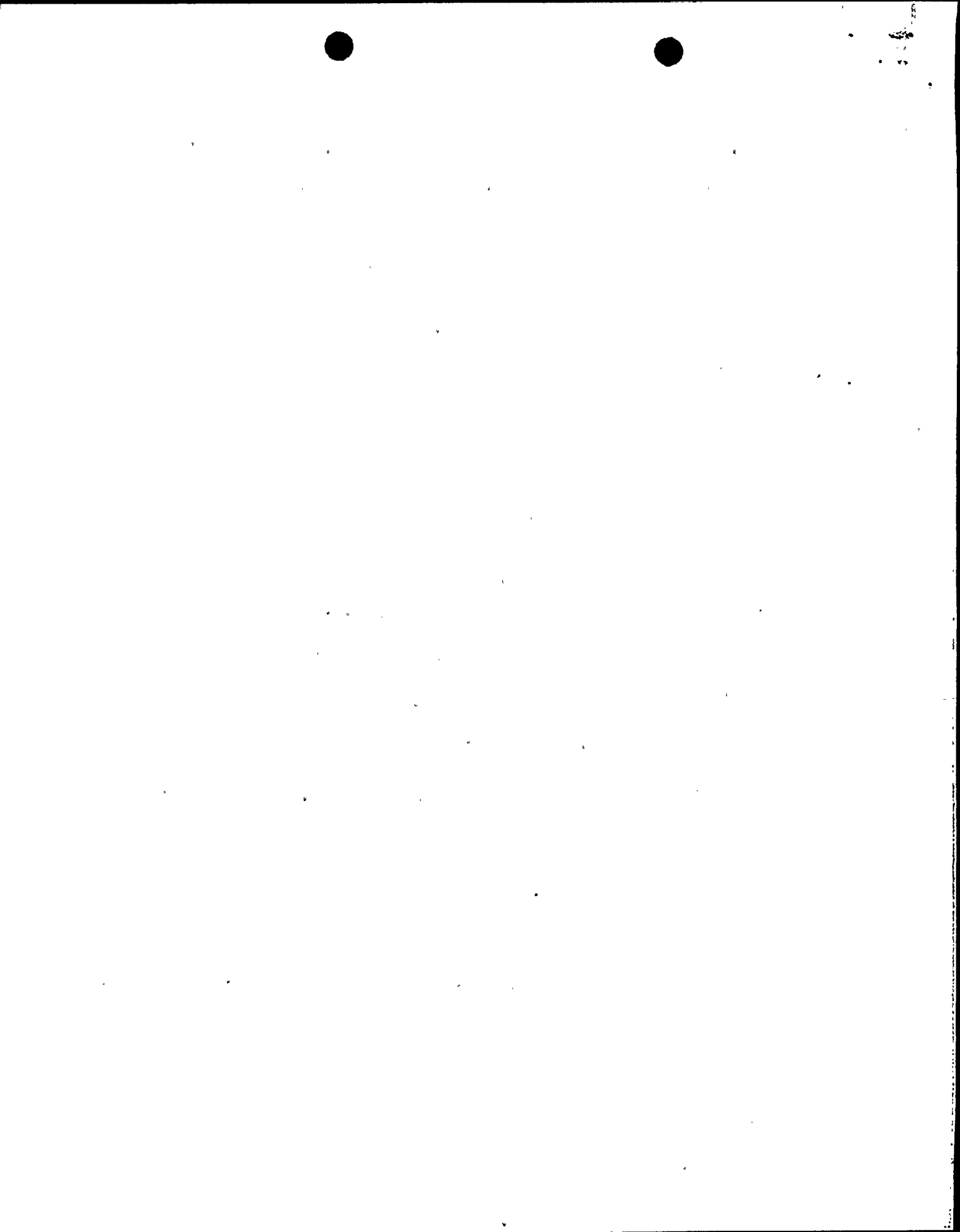
- 1) Identify each type of electrical circuit that penetrates containment.
- 2) Describe the primary and backup over current protective systems provided for each type of circuit identified in item 1.
- 3) Describe the fault-current - versus-time for which the primary and backup over current protective systems are designed and qualified.
- 4) Describe the fault-current-versus-time for which the penetrations are designed and qualified.



- 5) Provide coordinated curves between items 3 and 4 for each circuit identified in item 1 to show that the fault-current-versus-time condition to which the penetrations is qualified will not be exceeded.
- 6) Describe the provisions for periodic testing under simulated fault conditions.

In response to our request the applicant provided fault current versus time curves for primary and backup overcurrent protective systems. They also provided (informally as part of the qualifications for penetrations) fault-current-versus-time curves for which the penetrations are designed and qualified. It appears from this information that protective systems have not been designed to provide overcurrent fault protection for containment penetrations. Therefore, to assure containment integrity given an electrical fault, we require compliance with the recommendations of Regulatory Guide 1.63 or an acceptable alternative method and solution with bases.

In this regard, we require that the protective systems for each type of circuit passing through containment (Class 1E as well as non-Class 1E circuits) must provide for independent primary and backup overcurrent fault protective devices to preclude a single failure from impairing containment integrity. In addition, the protective systems must meet the following requirements of IEEE-279:

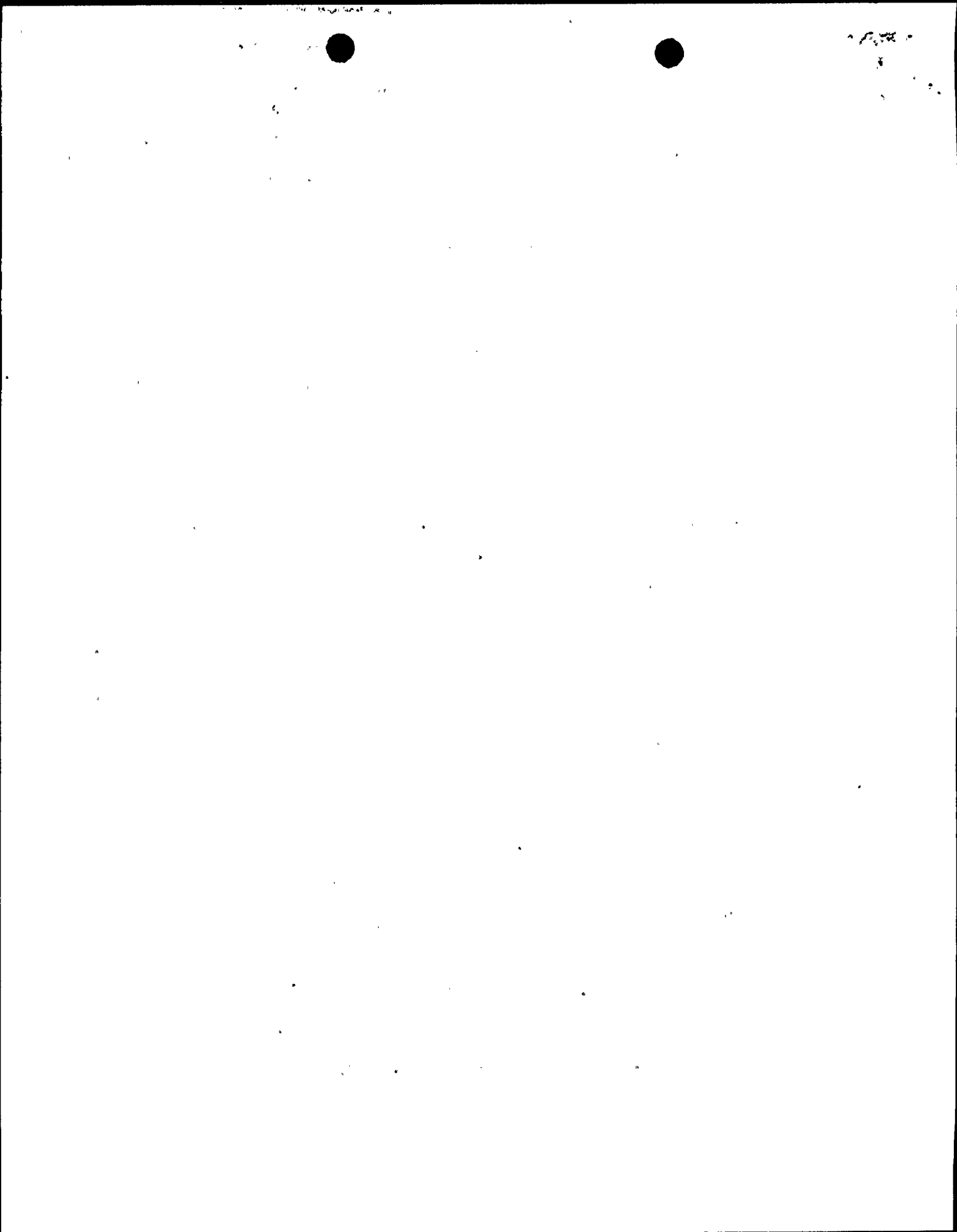


- A. Each system shall, with precision and reliability, automatically disconnect circuits passing through containment when currents exceed preset limits. These preset limits must not exceed the limit for which the containment penetration has been designed and qualified.
- B. All primary and backup breaker overload and short circuit protection systems shall be qualified for the service environment as follows:

Class 1E Systems and Components

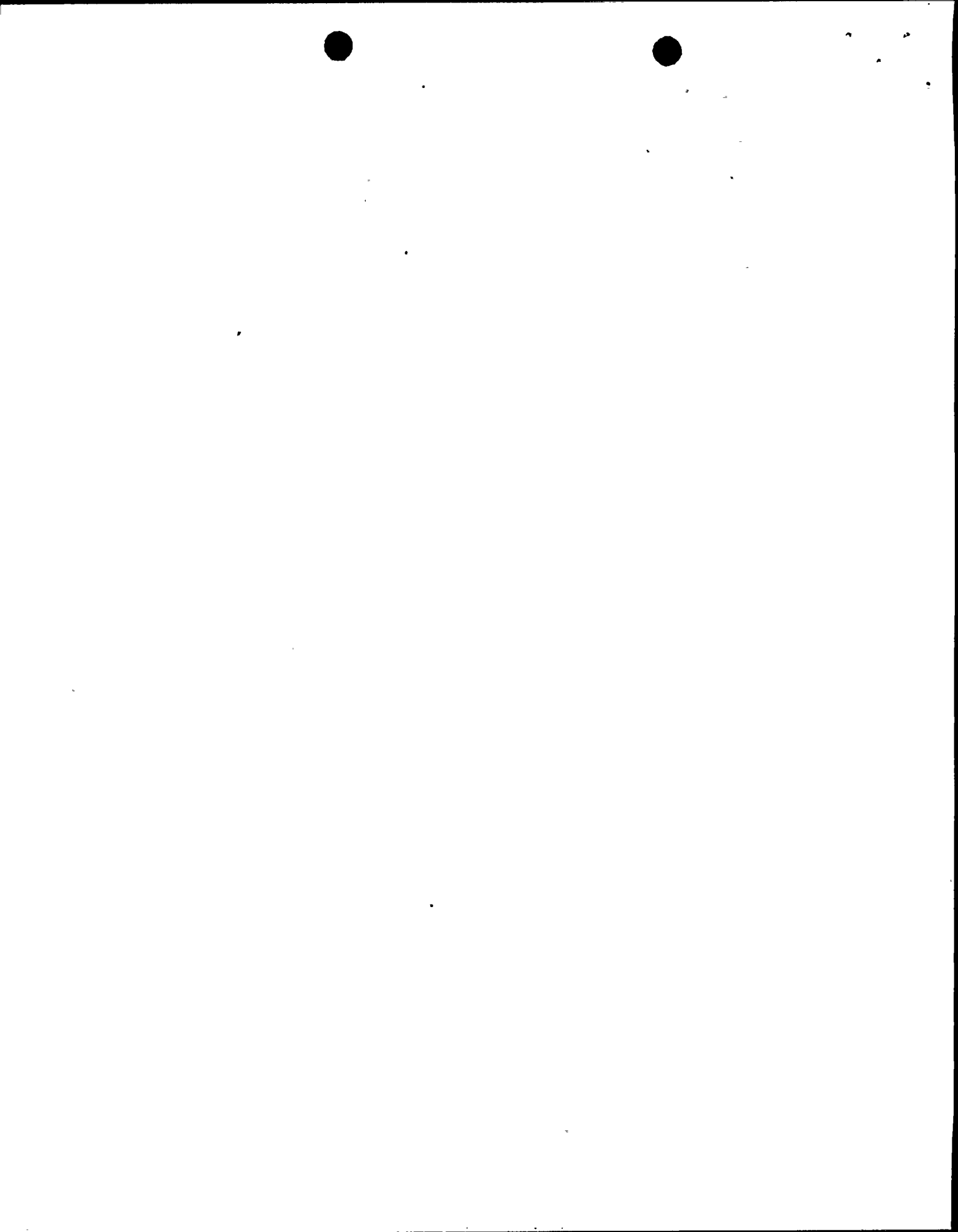
- 1. Should be environmentally qualified in accordance with the applicable standards and criteria.
- 2. Should be seismically qualified to demonstrate that before, during and after a safe shutdown earthquake:
 - (1) closed breakers will remain closed (energized circuits will remain energized),
 - (2) open breakers will remain open (deenergized circuits will remain deenergized), and
 - (3) breakers which are required to be remotely operated (opened or closed) are so operable.

Seismic qualification of breakers need not demonstrate actual fault current interruption capability during a seismic event.



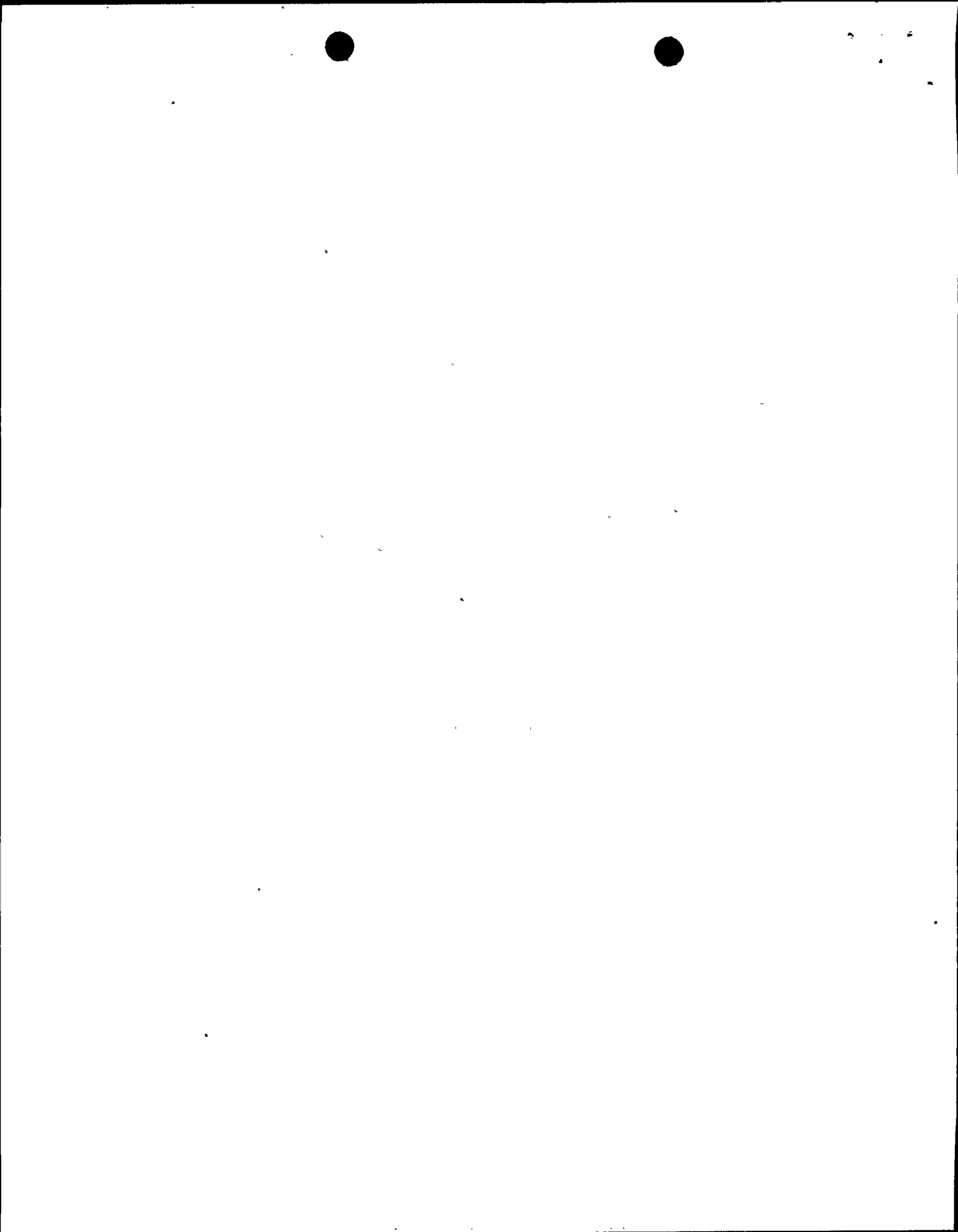
Non-Class 1E Systems and Components

1. No formal environmental or seismic qualification is required. However, the equipment should be of high industrial quality which should be verifiably by appropriate procurement documentation.
 2. The seismic capability should as a minimum assure that the systems remain operable during an operating basis earthquake.
- C. The circuit breaker protection system trip set points and breaker co-ordination between primary and backup protection shall have the capability for test and calibration. Provisions for test under simulated fault conditions should be provided. For designs where protection is provided by a combination of a breaker and a fuse or two fuses in series, provisions shall be provided for testing fuses.
- D. No single failure shall cause excessive currents in the penetration conductors which will degrade the penetration seals.
- E. Where external control power is used for actuating the protective systems, signals for tripping primary and backup system devices shall be independent, physically separated, and powered from separate sources.



600 Volt Containment Power Penetrations

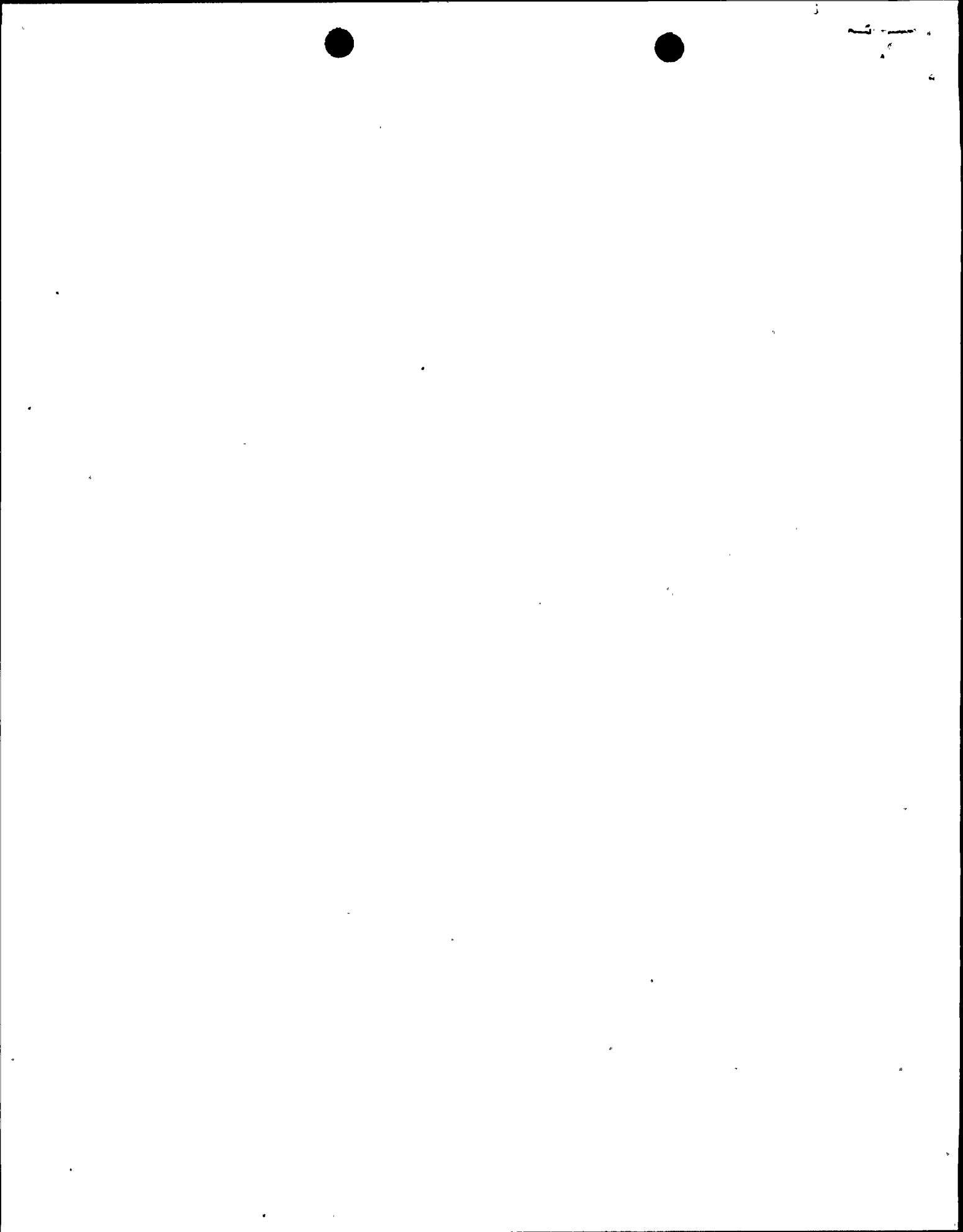
Indiana and Michigan Power Company shall modify the 600 volt containment electrical power penetrations circuits to meet the requirements of Regulatory Guide 1.63 prior to startup following the first regularly scheduled refueling outage. This modification consists of the installation of redundant circuit breakers in the 600 volt switchgear breakers in the event of a failure of the molded case circuit breakers.



ENCLOSURE NO. 5

Section 10.3.12.2 of amendment 62 to the FSAR, provides seismic qualification information in regard to devices mounted on instrument panels PIA, PIB and PIC. These devices included ~~nam~~^{Moore} DCA current alarms, a TCT thermocouple transmitter and SRT square root transmitters. These devices are not required to function during but are required to function after to provide the plant operator with reliable information to assess the status of the safeguards systems.

Information as to the electric function monitored before and after seismic shaking with results has not been provided in the FSAR. Provide this information.



MEETING SUMMARY DISTRIBUTION

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