

LICENSEE EVENT REPORT (LER)

FACILITY NAME (11)	DOCKET NUMBER (12)	PAGE (13)
DIABLO CANYON UNIT 1	0151010275	1 OF 07

TITLE MISSED SURVEILLANCE WHEN THE ESF TIME RESPONSE TEST FREQUENCY WAS NOT FOLLOWED DUE TO MISINTERPRETATION OF TECHNICAL SPECIFICATION REQUIREMENT

EVENT DATE (8)			LER NUMBER (9)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (6)		
MONTH	DAY	YEAR	YEAR	NUMBER	NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		
11	20	87	87	029	00061888						
									DOCKET NUMBER (3)		
									01510101		
									01510101		

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (11)

OPERATING MODE (1)

POWER LEVEL (10) 100

10 CFR 50.73(a)(2)(1)(B)

OTHER (Specify in Abstract, above and in Part, NRC Form 254)

LICENSEE CONTACT FOR THIS LER (12)

MARTIN HUG, REGULATORY COMPLIANCE ENGINEER

TELEPHONE NUMBER

AREA CODE: 805 595-7351

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC (14)	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC (14)

SUPPLEMENTAL REPORT EXPECTED (15)

YES (IN THE SUPPLEMENTAL REPORT) EXPECTED SUBMISSION DATE: _____

NO

EXPECTED SUBMISSION DATE (16)

MONTH DAY YEAR

ABSTRACT (18)

On November 20, 1987, and January 16, 1988, the time interval requirement specified by Technical Specification (TS) 4.3.2.2, Table 3.3-3, "Engineered Safety Features Actuation System Instrumentation," Functional Unit 1.f., "Steam Flow in Two Steam Lines-High," was exceeded, including the allowed extension of TS 4.0.2. Technical Specification 4.3.2.2 was exceeded when Unit 1 steam flow channels 512 and 513, and 522 and 523 were not time response checked on November 20, 1987, and January 16, 1988 respectively.

On May 12, 1988, management determined that the Unit 1 surveillance requirement for time response testing of the "Steam Flow In Two Steam Lines - High" surveillance interval was exceeded.

The cause of the event was personnel error, in that TS 4.3.2.2 was improperly interpreted and implemented.

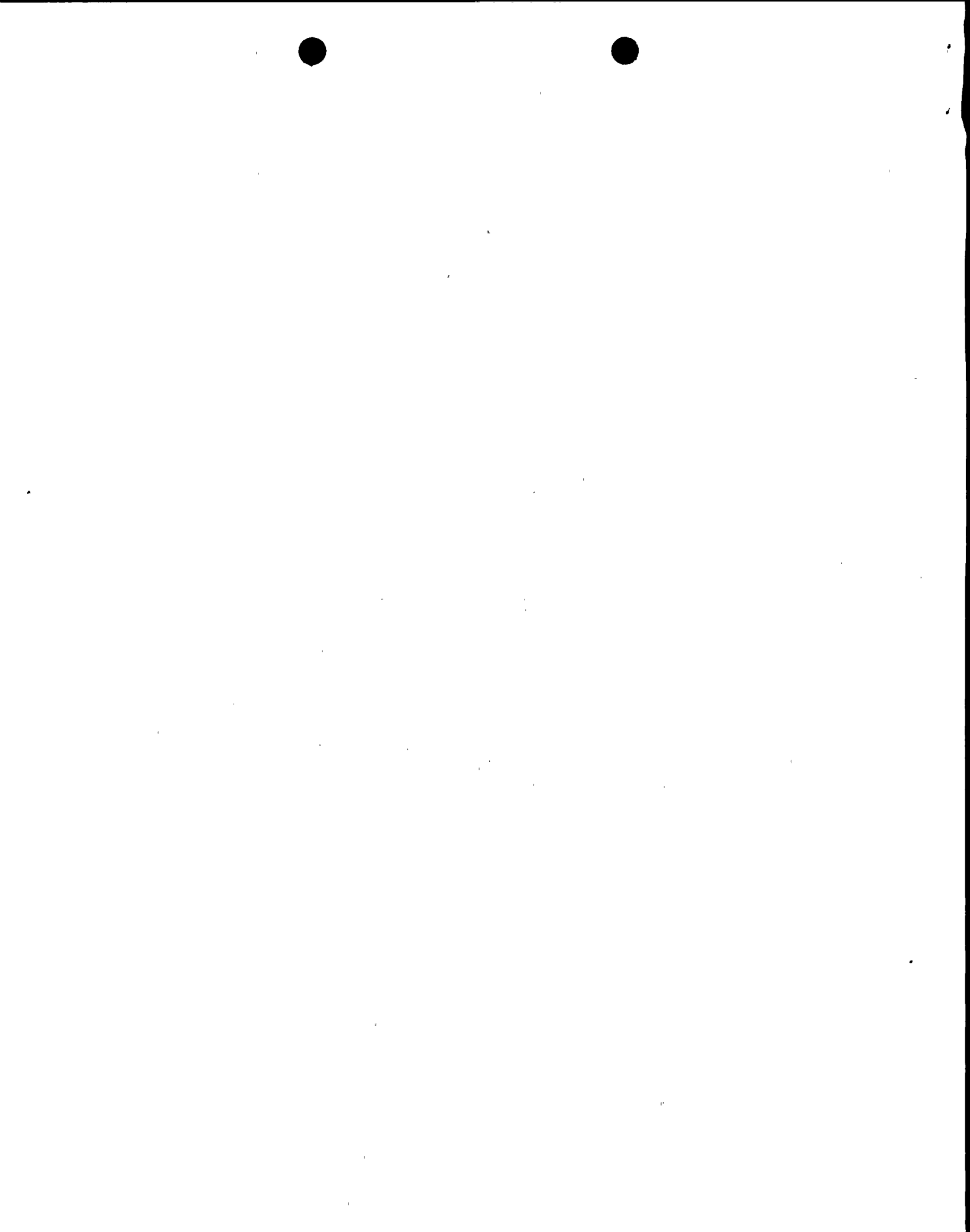
A review of past calibration history verified that the affected channels would have performed their intended function. Also, other ESF functions were available to provide an ESF signal for this type of accident. Therefore, the health and safety of the public has not been affected by this event.

To prevent recurrence, Surveillance Test Procedure (STP) I-33A "Reactor Trip and ESF Time Response Testing," will be revised to correct the sampling frequency as required by the TS.

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TEXT (If more space is required, use additional NRC Form 388A's) (17)

I. Plant Conditions

Unit 1 was in Mode 1 (Power Operations) at 100% power.

II. Description of Event

On November 20, 1987, and January 16, 1988, the time interval requirement specified by Technical Specification (TS) 4.3.2.2, Table 3.3-3, "Engineered Safety Features Actuation System Instrumentation," Functional Unit 1.f., "Steam Flow in Two Steam Lines-High," was exceeded, including the allowed extension of TS 4.0.2. Technical Specification 4.3.2.2 was exceeded when Unit 1 steam flow channels 512 and 513, and 522 and 523 were not time response checked on November 20, 1987, and January 16, 1988, respectively.

Technical Specification 4.3.2.2, Table 3.3-3, Functional Unit 1.f, requires one channel per function to be tested once every N times 18 months, where N is the total number of channels specified in the "Total Number of Channels" column of Table 3.3-3. For this functional unit the total number of channels specified in the "Total Number of Channels" column is 2/steam line. Therefore, all channels are required to be sampled once every 2 X 18 (N X 18) or 36 months. In accordance with STP I-33A, "Reactor Trip and ESF Time Response Testing," all 8 channels were being tested once every 72 months (N was assumed to be 4 instead of 2), therefore the sampling frequency was not in accordance with the TS 4.3.2.2.

B. Inoperable structures, components, or systems that contributed to the problem:

None

C. Dates for major occurrences:

- November 20, 1987: Under the allowed extension of TS 4.0.2, TS 4.3.2.2 was exceeded including the allowed extension of TS 4.0.2 when Unit 1 steam flow channels 512 and 513 were not time response checked.
- January 16, 1988: Under the allowed extension of TS 4.0.2, TS 4.3.2.2 was exceeded including the allowed extension of TS 4.0.2 when Unit 1 steam flow channels 522 and 523 were not time response checked.

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3. May 12, 1988: Discovery Date. Plant Management determined that the Unit 1 TS 4.3.2.2 time interval was exceeded.

4. May 24, 1988: Conference call with NRR to discuss TS 4.3.2.2 surveillance requirements.

D. Other systems or secondary systems affected:

None

E. Method of discovery:

The appropriateness of the ESF time response testing program sequence, and the fact that the testing frequency for steam flow channels 512, 513, 522, and 523 may not be in accordance with the requirements of TS 4.3.1.2 and 4.3.2.2, was identified by I&C and brought to the attention of Plant Engineering.

F. Operator actions:

None

G. Safety system responses:

None

III. Cause of Event

A. Immediate Cause

STP I-33A, "Reactor Trip and ESF Time Response Testing," contained the wrong test frequency.

B. Root Cause

Personnel error (cognitive) in that TS 4.3.2.2 was improperly interpreted and implemented. This misinterpretation was the result of the functional trip logic drawing being used to determine the number of redundant channels instead of the requirement outlined in the TS. The number of redundant channels was then used to determine the test frequency for the TS.

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IV. Analysis of the Event

A. Analysis of Consequences of Event

1. Past calibration history

A review of past calibration history for the affected channels showed that the channels are highly stable. This review verified that the affected channels would have performed their intended function if called upon during Unit 1 operation.

2. Rupture of a main Steam Line

The ESF instrument for the "Steam Flow in Two Steam Lines-High" is provided to detect a rupture of a main steam line (FSAR Update 15.4.2.1) and to initiate an ESF if the high flow is in coincidence with either low-low RCS average temperature or low steam line pressure in any two lines. Had a degradation in time response of the channels not been detected other ESF actuations, such as two-out-of-four low pressurizer pressure signal, would have been available to initiate the ESF (FSAR Update 15.4.2.1.1).

Since the calibration review determined that the affected channels would have performed their intended functions and other ESF were available to detect a rupture of a main steam line, the health and safety of the public has not been affected by this event.

B. NRC Requested Information

A conference call was held between Diablo Canyon Power Plant (DCPP) and Nuclear Reactor Regulation (NRR) to discuss the TS 4.3.1.2 and 4.3.2.2 surveillance requirements on May 24, 1988. During this phone conversation, NRR requested that certain information pertaining to these surveillance requirements be included in the LER. This information is provided below.

1. Slave Relay Testing

Slave relays (RLY) which control the actuation of the ESF valves (V) are not time response tested, but are assigned a conservative time response time of 12 milliseconds. The basis for not time response testing these relays is provided in Regulatory Guide 1.118 (Rev. 2, 1978) and IEEE Standard 338-1977. Regulatory Guide 1.118 states that requirements and recommendations contained in IEEE Standard 338-1977

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are considered acceptable methods for the periodic testing of electric power and protection systems. IEEE Standard 338-1977, Section 6.3.4, Paragraph 3 states:

Response time testing of all safety related equipment, is not required if, in lieu of response time testing, the response time of safety system equipment is verified by functional testing, calibration checks or other tests, or both. This is acceptable if it can be demonstrated that changes in response time beyond acceptable limits are accomplished by changes in performance characteristics which are detectable during routine periodic tests.

The IEEE criteria above is supported by the following basis:

- a. All slave relays are functionally tested on a quarterly frequency and the coil-side circuits are tested for continuity on a bimonthly frequency. These functional tests will determine if a slave relay has failed.
- b. The slave relays have few moving parts, therefore, degradation will normally be exhibited as a catastrophic failure of the device caused by a broken contact, coil failure, armature jam, broken wire or loose connection which would be detected during a routine periodic test.
- c. The vendor's literature for the slave relay documents a normal operation time in the range of 5 to 12 milliseconds. DCPD has used a constant of 12 milliseconds. The TS required response times of the systems that contain these devices vary from 7 to 66 seconds. Therefore, degradation of the time response of a slave relay will not cause a perceptible increase in a systems response time.

Based on the above criteria, DCPD has not time response tested the slave relays. However, DCPD management has reassessed the time constant used for slave relays in STP I-33A and has decided to either test the slave relays to determine the actual closing time or assume a response time of 1 second. There is no credible degradation scenario that would cause the response of a slave relay to exceed 1 second. The slave relay would fail before this type of time response would be attained. Failure of the slave relay would then be detected

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during a routine periodic functional test. In addition to the revision of the time constant above, DCPD will be placing additional requirements in the STP M-16, "Safeguards Active Component Operation by Slave Relay Operation," series of procedures. These additional requirements in this quarterly functional test of slave relays, will require the operator performing the test to verify that the slave relay responds promptly once the test switch has been pressed.

2. Problems Associated with Functional Units Tavq Low-Low and Steam Line Pressure - Low

Both of these functional units have one detector in each loop or steam line supplying input for the logic circuit. For both of these functional units the "Total Number of Channels" column of Table 3.3-3 lists one as the number of channels. DCPD has interpreted this as meaning N equal to four. Westinghouse has supported this interpretation. This interpretation is based on the number of redundant channels making up the logic for these functions being four. The functional redundancy is provided by four sensors, one in each loop or steam line.

3. Instrument Sampling.

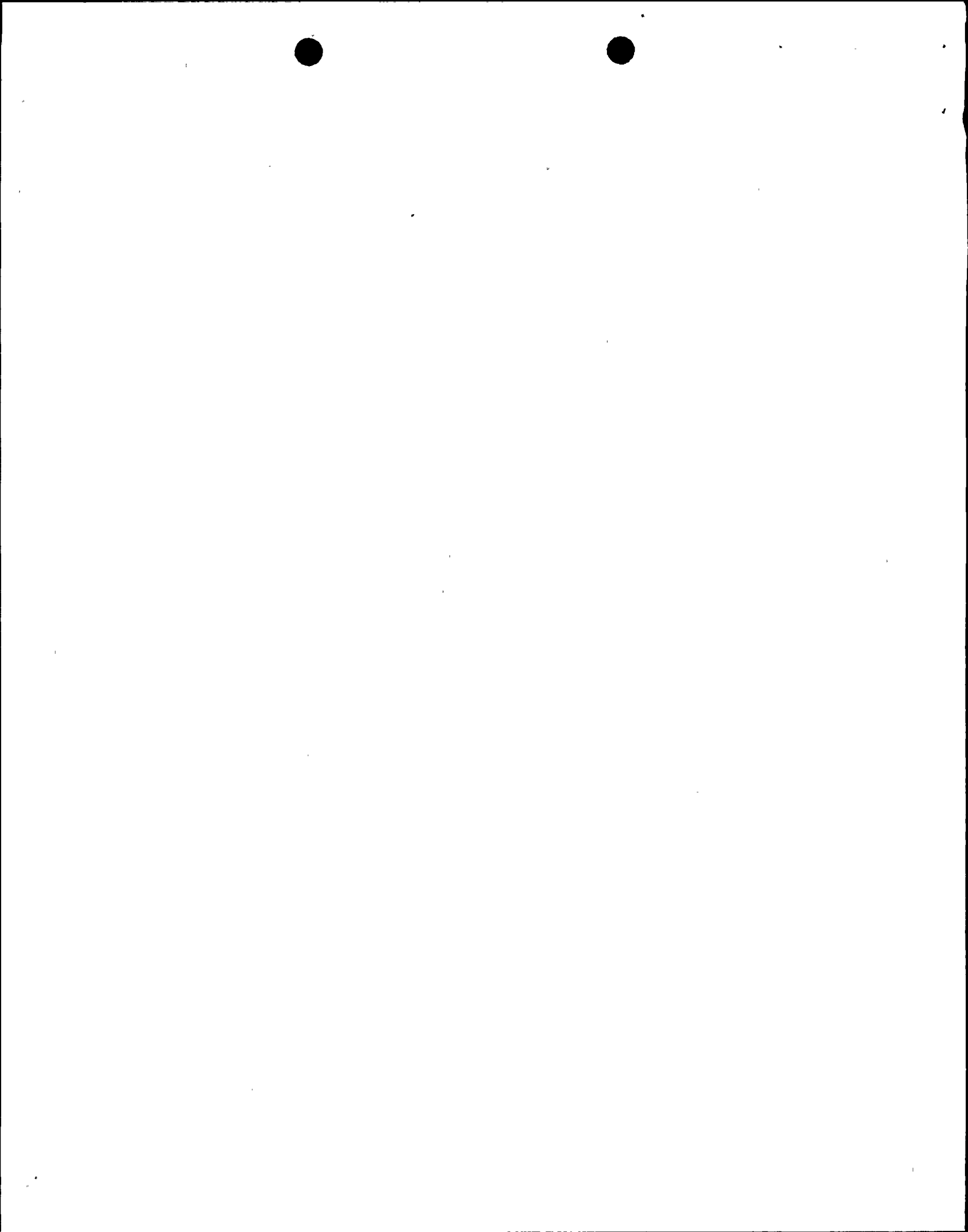
Both TS 4.3.1.2 and 4.3.2.2 require one channel per function to be tested such that all channels are tested in a period of N X 18 months. DCPD had been performing time response testing on a per loop or per steam generator basis. Each 18 month period all of the detectors in a loop or steam generator were tested. The procedure was implemented in this fashion because the functional trip logic was used to determine the frequency or the number of redundant channels. DCPD management has reassessed the methodology of performing these tests and will revise the sampling plan to require at least one of the detectors associated with a protection set to be sampled in each 18 month period.

V. Corrective Actions

A. Immediate Corrective Actions:

1. To determine which surveillance tests were missed, past records associated with TS 4.3.1.2 and 4.3.2.2 were reviewed to determine the last time this surveillance was performed for each component for a functional unit. Based on this review, a new testing frequency was determined for each component.

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- 2. Additional functional units on Unit 1 are being time response tested during the present refueling outage to ensure proper phasing into the new sampling plan.

B. Corrective Actions to Prevent Recurrence:

- 1. STP I-33A will be revised to correct the sampling frequency as required by the TS.
- 2. Time response testing will be performed on functional units on Unit 2 during the upcoming outage, to ensure the new testing frequencies are consistent with TS requirements.

VI. Additional Information

A. Failed Components:

None

B. Previous LERs on similar problems:

None

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James D. Shiffer
Vice President
Nuclear Power Generation

June 13, 1988

PG&E Letter No. DCL-88-154



U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

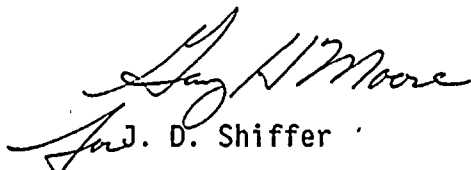
Re: Docket No. 50-275, OL-DPR-80
Diablo Canyon Unit 1
Licensee Event Report 1-87-029-00
Missed Surveillance when the ESF Time Response Test Frequency
was not followed due to Misinterpretation of the Technical
Specification Requirement

Gentlemen:

Pursuant to 10 CFR 50.73(a)(2)(i)(B), PG&E is submitting the enclosed Licensee Event Report, concerning a missed surveillance when the ESF time response test frequency was not followed due to misinterpretation of the Technical Specification requirements.

Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it in the enclosed addressed envelope.

Sincerely,


James D. Shiffer

cc: J. B. Martin
M. M. Mendonca
P. P. Narbut
B. Norton
H. Rood
B. H. Vogler
CPUC
Diablo Distribution
INPO
DCO-88-TN-N052

Enclosure

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