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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:	)	
	)	Docket Nos. 50-275-OLA-2
Pacific Gas and Electric Company	)	50-323-OLA
	)	(Construction Period
(Diablo Canyon Nuclear Power	)	Recovery)
Plant, Units 1 and 2)	)	
	)	

PACIFIC GAS AND ELECTRIC COMPANY'S REPLY FINDINGS OF FACT AND CONCLUSIONS OF LAW

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I. INTRODUCTION

On November 19, 1993, the San Luis Obispo Mothers for Peace ("MFP") filed voluminous proposed findings of fact and conclusions of law in this proceeding ("MFP Findings"). In accordance with the schedule adopted by the Atomic Safety and Licensing Board ("Board") on December 3, 1993, Pacific Gas and Electric Company ("PG&E"), hereby replies.

PG&E previously filed its proposed findings of fact and conclusions of law in this proceeding on October 8, 1993.[1] MFP's proposed findings and conclusions do not provide any supportable rationale to change the findings and conclusions previously

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[1] See "Pacific Gas and Electric Company's Proposed Findings of Fact and Conclusions of Law in the Form of an Initial Decision," dated October 8, 1993 ("PG&E Findings").

proposed by PG&E.[2] Rather, MFP largely ignores the testimony of record in this proceeding as well as the appropriate standard of review. MFP focuses instead exclusively on the details of minor, isolated incidents. Without any supporting testimony, it attempts in proposed findings to ascribe to those matters significance far beyond what the record would sustain.

Furthermore, MFP's sweeping conclusions not only mischaracterize the record, but are also directly contrary to evaluations inherent in the very documents on which MFP relies. Those documents demonstrate the isolated nature of each of the incidents involved and state the corrective actions planned or completed. MFP's conclusions are also contradicted by the witnesses' testimony describing the overall success of the maintenance and surveillance programs at Diablo Canyon. This evidence specifically places in context the relatively few, minor incidents relied upon by MFP. Given the existing record, MFP's proposed findings, gross generalizations, and overbroad conclusions are simply not supportable.

PG&E does not believe a detailed reply to each of the various MFP assertions, findings, and conclusions is either warranted or necessary. PG&E stands by its own proposed findings and

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[2] MFP's proposed findings and conclusions are similarly contradicted by those of the NRC Staff. See "NRC Staff's Findings of Fact and Conclusions of Law in the Form of an Initial Decision," dated December 22, 1993 ("NRC Staff Findings").

conclusions, which succinctly and accurately capture the essence of the record in this case. Nevertheless, PG&E offers the following specific reply findings to assist the Board. With respect to Contention I (Maintenance and Surveillance), PG&E focuses primarily on MFP's proposed "General Findings." These findings are, after all, MFP's attempt to give a point to all the documents it introduced into evidence. However, this attempt does not overcome MFP's failure to present its own testimony or to develop an adequate record. See Tr. 696-99, 826 (J. Kline). PG&E shows below how each of these general findings is unfounded as a matter of fact, logic, or law. With respect to MFP's specific findings on the MFP exhibits, Appendix A of PG&E's Findings remains an accurate distillation of the record on the issues. However, some of the more egregious misrepresentations of the record made by MFP are discussed on an issue-by-issue basis in Appendix A hereto. With respect to Contention V (Thermo-Lag Interim Compensatory Measures), MFP has so misjudged the scope of the admitted contention and misrepresented the evidence of record that only a brief reply is warranted.

II. CONTENTION I: MAINTENANCE AND SURVEILLANCE

A. General Perspectives on MFP's Findings

R1. PG&E correctly articulated the standard of review to be applied to this contention. See PG&E Findings at 3-10. As acknowledged by MFP, the standard is one of "reasonable assurance" and not "absolute perfection." MFP Findings 11-12. This MFP

concession is particularly important, and indeed ironic, given that MFP then attempts to found a case, based upon minor occurrences of the type specifically anticipated in the operation of any power plant. Compare Union Electric Co. (Callaway Plant, Unit 1), ALAB-740, 18 NRC 343, 346 (1983); Pacific Gas & Electric Co. (Diablo Canyon Nuclear Power Plant), ALAB-756, 18 NRC 1340, 1344-45 (1983); see also Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit 1), ALAB-729, 17 NRC 814, 827-28 (1983) (citing Na[illegible] v. Ray, 363 F. Supp. 946, 954 (D.C.C. 1973)).

R2. In making a "reasonable assurance" finding, the Board must properly focus on whether there has been any "pervasive" program implementation breakdown that raises a "legitimate doubt" as to the overall integrity of the maintenance and surveillance programs. Callaway, ALAB-740, 18 NRC at 346. Likewise, the Board must focus, at a programmatic rather than microscopic level, on whether there has been demonstrated any "fundamental flaw," i.e., one requiring that an "essential element" of the program be "reassessed and reconceived to a significant extent." Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), ALAB-903, 28 NRC 499, 506-7 (1988). Given the precedent of these benchmark decisions, the relevancy and evidentiary value of the numerous documents introduced by MFP is minimal. These documents, or the portions selectively cited by MFP, address minor, and often trivial, matters -- matters that have been identified, have been

determined to involve minimal safety significance, and for which corrective actions have been planned or taken.

R3. MFP, in almost 300 pages of proposed findings and conclusions, hardly even acknowledges the important programmatic performance evidence of record -- evidence that goes directly to the central issue of this contention. This evidence includes objective plant performance data as well as subjective assessments of maintenance and surveillance activities at Diablo Canyon made by the NRC Staff and an industry expert (Mr. Dillard). In light of Callaway and Shoreham, the greatest weight must be assigned to this evidence of overall program performance. This evidence, which demonstrates quite clearly the effectiveness of PG&E's maintenance of the Diablo Canyon plant, is captured in PG&E Findings M50-M77. See also PG&E Findings M84-M94.

R4. The record is replete with support for the proposition that excellent operating performance cannot be achieved over long periods of time without effective maintenance of equipment. See PG&E Findings M50-M51. Similarly, given the limitations established by plant Technical Specifications with respect to operation with unavailable equipment, reliability of equipment is directly indicated by plant performance. PG&E Finding M52. In its narrow focus on details rather than probative and relevant programmatic evidence, MFP has missed the proverbial forest for the trees. MFP would have the Board extrapolate broad conclusions from

isolated examples of personnel performance or equipment problems. This approach results in an almost surreal picture of the record, distorting the evidence and the facts regarding the performance of the programs at issue. MFP's grim picture simply cannot be squared with the operating record of the plant and the overall assessments that have been made of PG&E's maintenance and surveillance programs. See, e.g., PG&E Findings M55, M63-M67, M69-M71, M76.

R5. In its detailed discussions of individual incidents, MFP repeatedly asks that the Board substitute its judgement for that of the NRC Staff and PG&E -- without the benefit of any supporting expert testimony. MFP would have the Board second guess uncontradicted evidence regarding root causes, specific corrective actions, or the adequacy of particular maintenance tasks or procedures. See, e.g., MFP Findings 203 ("eddy current testing is not being performed with sufficient frequency"), 550 ("PG&E's response to [steam generator] nozzle cracking has been neither adequate nor proactive"). However, MFP called no witnesses of its own, offered no expert testimony, and introduced no documents other than PG&E, NRC, or Institute for Nuclear Power Operations ("INPO") documents. As a result, no evidence supports the highly specific judgments that MFP would have the Board make based on documents alone.

R6. The Board must base its decision on substantial evidence contained in the record. Public Service Co. of Indiana (Marble

Hill Nuclear Generating Station, Units 1 and 2), ALAB-459, 7 NRC 179, 191 (1978). MFP may not rely upon extra-record, non-expert opinion testimony in the guise of proposed findings which lack a basis in the record. See NRC Staff Findings 2, I-43 (citing precedent for the proposition that opinions must be sponsored by experts subject to cross-examination).

R7. MFP urges the Board to base findings upon MFP's reading of the documents. However, a selective reading of documents such as PG&E Non-Conformance Reports ("NCRs") or Licensee Event Reports ("LERs"), uninformed by expert testimony, is simply an inadequate basis for the Board to inject itself into the detailed engineering decisions and judgments that are inherent in the documents. The evidence of record shows that PG&E has a thorough and candid process for evaluating, ventilating, and resolving issues -- often with input from several different qualified licensee organizations. See, e.g., Tr. 1483-84 (Dillard). In this context, the Board should properly defer to the professional determinations of PG&E and the NRC Staff -- often inherent in the very documents MFP introduced -- with respect to the evaluation and resolution of specific matters. A proper focus on programmatic performance evidence also renders unnecessary and unproductive the microscopic inquiry urged by MFP.

R8. MFP asserts, in proposed Finding 13, that "the NRC does not have detailed regulations prescribing conditions for an

adequate maintenance and surveillance program. Likewise, there are not regulations telling us how to judge the performance of PG&E to date. . . . Thus, we [the Board] must articulate our own criteria for judging the adequacy of PG&E's program." This assertion is erroneous and directly contradicted by the record. In fact, numerous NRC regulations and documents specify the detailed elements of an effective and comprehensive maintenance and surveillance program. PG&E Direct Testimony at 21-22 (Giffin). In addition, first-hand NRC inspections and comprehensive evaluations provide an extensive basis for findings regarding the adequacy and effectiveness of PG&E's maintenance and surveillance programs. See PG&E Findings M7, M9, M11, M12, M15-M30, M63-M68.

R9. In its Finding 14, MFP concedes that "the Institute for Nuclear Power Operations (INPO) guidance document, INPO 90-008 (MFP Exhibit 4) is helpful in defining the scope of issues that a maintenance program must address in order to provide adequate protection to public health and safety." However, after mentioning the importance of INPO 90-008 as a standard for evaluating maintenance and surveillance programs -- a point with which PG&E agrees -- MFP's proposed findings never again mention this standard. There is ample and detailed record evidence of PG&E's compliance with the standards set forth in INPO 90-008. See PG&E Findings M15-M30.

R10. MFP proposes four "factors" it considers to be relevant to a general assessment of the adequacy of PG&E's maintenance and surveillance programs. These are: 1) Are essential systems functioning and reliable? 2) Have minor maintenance problems been left uncorrected? 3) Do maintenance problems arise from a breakdown of multiple barriers? and 4) Do the same types of problems repeat themselves? MFP Finding 14. MFP fails to show a programmatic deficiency by at least three of its own standards. (As will be discussed below, we do not agree that the "factor" related to "multiple barriers" is in any way germane to the issues at hand. This "factor" reflects no more than a component of a root cause evaluation, and sheds no light on a program assessment of the type dictated by the contention.)

R11. MFP specifically recognizes, and PG&E agrees, that "the primary indicator of whether maintenance and surveillance is adequate is whether the essential systems relied on for safety are functioning and reliable." MFP Finding 14. With respect to performance of essential equipment, the evidence of record is unequivocal. The performance of Diablo Canyon equipment has been outstanding as demonstrated by consistently high capacity factors, long periods of continuous operation, short refueling outages, and maintenance downtime within Technical Specification limits. See PG&E Findings M50-M56. MFP directs the Board's attention to a relatively few cases in which equipment did not perform as expected. However, these exceptions require context. The

witnesses have provided context and MFP has never confronted, much less contradicted, that context.[1]

R12. With respect to the timeliness and effectiveness of PG&E's corrective actions (MFP's second and fourth "factors"), the record is also clear that PG&E's overall performance is good. MFP again focuses on examples that prove to be the exceptions. The NRC Staff -- which is in the best position to provide an overall assessment on this point -- testified clearly and convincingly that PG&E's performance in this area does not represent a widespread concern. See PG&E Finding M91. In addition, the most important tool a licensee has to reduce repetitive problems is an effective root cause evaluation process. The outside assessments of PG&E's root cause process by the NRC Staff and Mr. Dillard were uniformly enthusiastic. See PG&E Findings M70, M76, M80, M88. In the face of this testimony, it would be illogical to conclude that the relatively few and minor exceptions highlighted by MFP prove that there is a pervasive problem in this area.

R13. MFP glibly and superficially dismisses the programmatic evidence of record in one simplistic proposed finding (see MFP Finding 23). In this case MFP in particular dismisses the NRC

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[1] It is also worth emphasizing that the Board has pointed out previously that the focus of Contention I is equipment performance. Tr. 826 (J. Kline); see also PG&E Findings at 8-9. MFP, in its proposed findings, often diverges into issues far removed from equipment performance (e.g., personnel errors, plant operations).

Staff's assessments embodied in the Systematic Assessment of Licensee Performance ("SALP") program. Contrary to MFP's claims, SALP assessments are relevant and probative. They provide context in which to view the examples cited by MFP. They include an evaluation directed precisely to the maintenance and surveillance functional area and reflect the NRC Staff's informed judgment regarding all recent experiences in this area, including the subset of that experience selected by MFP. See, e.g., Tr. 2215 (Miller).

R14. As PG&E Exhibit 20 demonstrates, the NRC's current SALP evaluation covered the period July 1, 1991 through December 31, 1992, a period during which many of the incidents cited in MFP's proposed findings occurred. Contrary to MFP's proposed Finding 23, the NRC SALP report specifically encompassed these events, as well as NRC inspection reports, PG&E LERs and NRC enforcement correspondence which relate to these events. See, e.g., PG&E Exhibit 20 at 4 (reactor cavity sump wide range level channels); at 4, 8 (improvement in personnel error trends); at 5 (steam generator shot peening); at 8, 14 (containment fan cooler unit backdraft dampers); at 8 (containment personnel airlock); at 8 (control of rigging of cask); at 8 (reactor coolant system leakage); at 14 (steam generator feedwater nozzle cracking); at 14 (erosion/corrosion monitoring program); at 14 (in-service testing program); at 15 (motor operated valve inspection program); at 16 (safety system availability); at 17 (safety analyses). In addition, the NRC Staff testimony in this proceeding specifically

addressed the significance of many events cited by MFP, and concluded that these events did not demonstrate any programmatic weaknesses or problems. See PG&E Findings M68-M71; NRC Direct Testimony at 6-15 (Miller, Narbut).

R15. Furthermore, contrary to MFP's assertion in its Finding 23, all of the evidence of record can be "reconciled." The broad conclusions of the PG&E and NRC Staff witnesses, including those embodied in the SALP scores, easily can be reconciled with the issues reflected "in the details," because the details are precisely that -- details, devoid of context. By inundating the Board with details such as minor operational occurrences, snippets of root cause assessments for individual incidents, and out-of-context assessments of equipment and personnel performance in isolated cases, it is MFP's conclusions that stretch the record and distort the facts.

R16. MFP also attempts to summarily dismiss the testimony of Mr. Dillard (see MFP Finding 24, at 12-13). This cannot be accomplished so easily. Mr. Dillard is a well-qualified expert on the subject. PG&E Finding M73. While he obviously does not know all the details of the Diablo Canyon programs, his testimony must be accepted in the spirit it was offered. See PG&E Finding M75. He provided the Board with an assessment, made with experienced eyes, of the tangible evidence at Diablo Canyon. Contrary to MFP's argument, Mr. Dillard's informed views provide added assurance

regarding the effectiveness of PG&E's implementation of maintenance and surveillance programs. His integrity is supported by his frank and professional views regarding the NRC's maintenance rule. Tr. 1486 (Dillard).

R17. Finally, as a preliminary matter, MFP asserts in its proposed Finding 17 that there is "one factor that clearly will change during the extended lifetime of [Diablo Canyon], and that is that the plant will age -- for a much longer period than was originally contemplated when it was licensed." This statement is simply unsupported in the record. There is no evidence in the record that a full 40-year operating life was not contemplated, nor is there any evidence that there is some unique "aging process" at Diablo Canyon that has not been subject to PG&E's existing maintenance and surveillance programs. In fact, the record demonstrates that the 40-year operating life requested by PG&E was expressly assumed when the plant was originally designed and constructed, and that maintenance and surveillance programs, inspection programs, the plant Technical Specifications, and aging management initiatives ensure that, regardless of the age of the facility, the plant's systems, structures and components will be refurbished or replaced to maintain their requisite safety function over 40 years of operation. See PG&E Findings M3-M5, M30-M38.[4]

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[4] Given the necessarily predictive aspect of assessing future operations at a nuclear power plant in any adjudicatory proceeding, the Board may also properly depend to some degree on future NRC Staff activity through its routine inspection (continued...)

B. MFP's General Findings

1. Failure or Unreliability of Safety Systems

a. Reduction in Safety Margins

R18. MFP's first general finding relates to alleged reductions in safety margins. MFP states: "Most of PG&E's maintenance problems in the last several years have disabled or threatened essential safety systems." MFP Finding 25 at 13. This is a good example of a conclusion that, even if true, would have no bearing on Contention I. There is in this conclusion no indication whatsoever as to the scope or frequency of these alleged "maintenance problems." The proposed finding therefore is immaterial to an assessment of whether the evidence suggests a "pervasive failure" that is "of sufficient dimensions to raise legitimate doubt as to the overall integrity" of the maintenance and surveillance programs. Callaway, ALAB-740, 18 NRC at 346.

R19. Furthermore, the evidence of record does not in any event support the proposed general finding. The examples cited by MFP do not suggest a pervasive problem of failed or unreliable equipment at Diablo Canyon. As discussed above, there was ample evidence introduced as to the excellent operating performance of Diablo Canyon, and the excellent equipment and plant material conditions.

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[4] (...continued)
programs to monitor licensee activities to provide reasonable assurance of continued safe operation. See, e.g., Metropolitan Edison Company (Three Mile Island Nuclear Station, Unit 1), LBP-81-32, 14 NRC 381, 492 (1981).

See, e.g., PG&E Findings M50-M56, M63-M64, M69, M76. This evidence directly refutes MFP's proposed general finding.

R20. Moreover, contrary to MFP's fundamental claim, the examples cited by MFP (see MFP Finding 27) by and large did not involve significant reductions in safety margins as claimed by MFP. For example, MFP cites the incident of a failure of Limitorque valve 2-FCV-37 to close during a routine surveillance test. See PG&E Findings M-A69 - M-A71. MFP then attempts to breath significance into this by assuming (in MFP Finding 27) "the essential role of this equipment in the safe operation of the plant." However, MFP Exhibit 57 at 7-12, specifically documents a detailed evaluation by PG&E showing that the failure of this valve to close will not cause the loss of safety functions, even assuming an additional single failure. MFP is simply "testifying" to a desired result. There is no factual support in the record.

R21. Similarly, MFP includes in the list in Finding 27 several incidents wherein there is uncontroverted evidence that the equipment problems noted by MFP did not affect system operability. Notwithstanding problems with the backdraft dampers in the Containment Fan Cooler Units ("CFCUs"), PG&E's evaluation determined that the CFCU system was operable in the as-found condition. PG&E Direct Testimony at 88 (Giffin); MFP Exhibit 104 at 15-16. MFP includes the incident of the "wrong size motor" installed in an actuator for a motor operated valve ("MOV").

However, the uncontroverted evidence is that even with the wrong motor, the MOV would still have performed its intended function. PG&E Finding M-A20. MFP also includes in this category the example of sheared motor pinion keys in certain Limitorque motor operators. Again, MFP ignores the testimony that the valve operators would have performed their intended function even with sheared keys. PG&E Finding M-A183. These examples illustrate how MFP has repeatedly mischaracterized the record.

b. Analyses of Safety Significance

R22. MFP next engages in one of its more extreme exercises in sophistry. MFP, again with no evidentiary support, claims that PG&E incorrectly evaluated the safety significance of events. MFP states, at 16:

> It is simply unacceptable to argue that there is "no safety significance" when redundancy of a safety system is eliminated through PG&E's error or neglect. Not only do we reject this type of reasoning, it represents a deficiency in PG&E's maintenance program, because it reflects poor judgment and a cavalier attitude by PG&E toward safety.

R23. This proposed finding must be rejected for several reasons. First, as a matter of law and NRC policy, MFP's definition of safety significance is wrong. MFP is attempting to apply a general design criterion (the single failure criterion) to the operating conditions of the plant. Operating conditions are more appropriately governed by Technical Specifications. The standard Technical Specifications incorporated into the Diablo

Canyon operating license inherently conclude that the plant can be safely operated (with sufficient margins of safety to provide "reasonable assurance") for limited periods of time with redundant equipment out of service. See 10 C.F.R. § 50.36(C)(2). MFP's argument is based on a level of equipment performance neither required nor necessary for safe operation.

R24. Similarly, as the record reflects, a defense-in-depth philosophy was specifically incorporated into the design of Diablo Canyon, the plant operating programs, and the maintenance and surveillance programs. This philosophy expressly anticipates and accommodates equipment failures and personnel errors that are essentially random in time and location. See, e.g., PG&E Finding M92. There are redundant trains of equipment; there are surveillance programs to detect problems; operators are trained to recognize and respond to problems; and maintenance tasks are designed to predict, prevent, and correct problems. PG&E Direct Testimony at 7 (Giffin, Crockett), at 38-41 (Ortore). It is simply erroneous to suggest, as does MFP, that any loss of redundancy equals a "safety significant" event. See Washington Public Power Supply System (WPPSS Nuclear Project, Nos. 3 and 5), LBP-78-14, 7 NRC 599, 612 (1978) ("Redundant engineered safety feature components and systems will be provided so that a single failure of any of these components or systems will not result in the loss of the capability to achieve safe shutdown of the reactor.")

R25. Third, as a factual matter, MFP's argument is based on a straw man. PG&E never testified to the definition of safety significance as ascribed to it by MFP. In a rare case in which MFP actually cites the transcript, MFP completely distorts the record. MFP states that PG&E equated a lack of safety significance of an issue with the fact that "no accident occurred as a result." MFP Findings at 15. However, the witnesses simply did not say this. The PG&E witnesses testified that, in performing safety significance evaluations, consideration is specifically given to the potential for safety consequences -- that is, beyond the fact that there were no actual consequences. This includes consideration of the possible effects of other failures or occurrences (that did not happen), the redundancy of equipment, and the capability of the equipment involved to perform the intended function. Tr. 792-93 (Giffin, Crockett); see also Tr. 1107-08 (Giffin).

R26. In addition, no witness of record adopted the view of safety significance now advocated by MFP. To the contrary, the witnesses of record stated that the incidents cited by MFP are minor; they not only involved no actual safety consequences, but involved low potential safety significance. PG&E Direct Testimony at 84; Tr. 2214-15 (Miller). MFP cannot unilaterally change the minor, and often trivial, nature of the matters it relies upon; nor can it change the testimony of record by adopting a definition of

safety significance unsupported by either the witnesses or NRC policy.

R27. Finally, and perhaps most obviously, MFP's attempt to link this illusory issue with Contention I is a red herring. There is no nexus between the semantic issue -- invented by MFP -- and the adequacy of the Diablo Canyon maintenance and surveillance programs. The assault on PG&E's safety ethic is simply unfounded and unwarranted.

2. Untimely or Ineffective Corrective Actions

R28. MFP next attempts to argue that PG&E's programs are deficient because PG&E has not taken timely actions to address certain alleged maintenance deficiencies (MFP Finding 33) and "in many cases" corrective actions were not effective to prevent recurrence of the same or similar problems (MFP Finding 34). Again, however, these proposed findings blithely ignore the evidence of record directly on point. That evidence conclusively contradicts the proposed findings.

R29. As noted above, the NRC Staff witnesses addressed the timeliness and effectiveness of PG&E's corrective actions. The Staff witnesses were well aware of the incidents cited by MFP, and concluded -- with knowledge of the fuller picture -- that PG&E's performance with respect to the timeliness of corrective actions in the maintenance and surveillance area is good. NRC Staff Direct

Testimony at 12-13 (Narbut, Miller); PG&E Finding M91. The Staff senior resident inspector also specifically testified that the "vast majority" of PG&E's corrective actions are effective. Tr. 2203 (Miller). It is simply implausible for MFP to reach, based on a few examples, a contrary programmatic conclusion. MFP's specific assertions are further discussed below.

a. Untimely Response

R30. With respect to the timeliness of actions, MFP continues to ignore the directly relevant testimony cited above. Interestingly, MFP in its proposed Finding 31 on this point also misquotes Commission precedent in an attempt to buttress its argument. Referring to Pacific Gas and Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-756, 18 NRC 1340, 1348 (1983), MFP adds the word "whether" to its quote from the case, creating the false impression that the issue there, and here, is whether deficiencies were corrected "almost from their inception." There is, however, no support for the notion that immediate identification and correction of deficiencies is the standard.[5] In the Diablo Canyon case cited, the Appeal Board found the fact that the deficiencies were corrected immediately to be an important point. It was not, however, a prerequisite to the decision. The determinative issue in the case was whether there were significant

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[5] Compare 10 C.F.R. Part 50, Appendix B, Criterion XVI (whereby adverse conditions are to be identified and corrected "promptly," a subjective standard that inherently requires an assessment of context and safety significance).

uncorrected construction errors or "a breakdown of the construction quality assurance program sufficient to raise legitimate doubt as to the plant's capability of being safely operated." Diablo Canyon, ALAB-756, 18 NRC at 1345 (citing Callaway, ALAB-740, 18 NRC at 346). In light of the Staff's testimony in the present case, it is clear that there has been no such pervasive breakdown at Diablo Canyon with respect to responding to maintenance problems.

R31. In MFP Finding 34, MFP lists 13 issues it believes to be examples wherein PG&E has been "lax and untimely" in responding to maintenance problems. However, the pertinent overall assessment remains that found in PG&E Finding M91. Moreover, the evidence with respect to these specific issues does not support the sweeping general finding. In fact, much of the evidence directly contradicts MFP's position.

R32. For example, in regard to medium voltage underground cable failures, MFP claims that PG&E was slow to take action in the eventual replacement of the cable. See MFP Finding 126. However, as MFP Exhibit 15 clearly states, PG&E promptly replaced the faulted portion of all failed cables with new replacement cable after each event, and even replaced non-failed sections of cable as a prudent measure. Moreover, the PG&E witnesses testified that, even though PG&E has concluded that there was not an imminent problem with the 4 kV safety-related cables, nonetheless the Company is considering additional monitoring techniques for the

cables as part of its corrective actions. Tr. 657 (Giffin, Ortore). There is no probative testimony on the record, including (significantly) from the NRC Staff, suggesting that PG&E's actions on this issue have been untimely.

R33. Similarly, MFP includes here the issue of intergranular stress corrosion cracking ("IGSCC") identified by PG&E in emergency core cooling system accumulator tank sample and fill line nozzles. See PG&E Findings M-A72 - M-A75. PG&E indeed found IGSCC indications during its own surveillances. PG&E made timely repairs and increased inspection frequencies. Id. The NRC Staff witnesses pointedly testified that PG&E's efforts on the issue were "very good work." Tr. 2178 (Miller). MFP's attempt to prove its general finding with this example is incomprehensible.

R34. The rest of MFP's list includes an amalgam of other issues that define the spectrum of the timeliness of PG&E's various corrective actions. PG&E's actions were admittedly not optimal in a very few isolated cases, including the CFCU issue. PG&E Finding M-A143. Likewise, PG&E has acknowledged that an inoperable reactor cavity sump wide range level indicator was not promptly identified by operators. PG&E Finding M-A111. However, these examples have been placed in context by the overall assessments of record. They have been addressed by corrective actions. These relatively few and isolated examples simply do not outweigh either the positive examples or the positive testimony regarding PG&E's overall

responsiveness. MFP's proposed general finding must be dismissed as lacking support.

b. Ineffective Corrective Actions

R35. In MFP Finding 35, MFP lists 17 issues it believes to be examples where PG&E has been "ineffectual" in its corrective actions. Many of these incidents are repeated from MFP Finding 34. Most importantly, MFP again ignores the record cited in PG&E Finding M91. As noted above, the NRC resident inspector specifically testified that the "vast majority" of PG&E's corrective actions are effective. Tr. 2203 (Miller). No witness disagreed. This alone is a compelling basis to reject the proposed general conclusion.

R36. There is no evidence that any of the 17 incidents cited by MFP are related to each other, so MFP is obviously focusing on PG&E's performance on a case-by-case basis. On this basis, the number of incidents (17) is small enough that it can be dismissed out of hand, given the thousands of maintenance and surveillance tasks performed annually at Diablo Canyon. Nonetheless, a close reading of MFP's specific findings related to the 17 incidents, and the record with respect to those incidents, actually refutes MFP's conclusions and calls into question MFP's credibility. The evidence shows that PG&E's maintenance program is thorough, timely, and effective. The few isolated problems that have recurred have been subject to thorough review and appropriate corrective action.

R37. For example, MFP again includes in this category the issue of IGSCC in emergency core cooling system accumulator tank nozzles. MFP argues, in proposed Findings 267, 271, 275, and 276, that PG&E replaced only some, but not all, the nozzles in response to a 1991 NRC Information Notice. However, the record shows that PG&E identified IGSCC indications in Unit 2 nozzles long prior to the NRC Information Notice. PG&E Finding M-A73. At that time, all leaking nozzles were either repaired or replaced, and surveillance frequency was increased. Id. In 1991 and 1992, subsequent to the Information Notice, PG&E identified additional IGSCC indications in Unit 1 and 2 during the increased surveillance. Again, all affected nozzles were repaired. PG&E Finding M-A74. At no time have IGSCC indications or small cracks rendered any of the accumulators inoperable (i.e., unable to perform the intended safety function). MFP Exhibit 60 at 7. There is nothing inadequate or insufficient regarding these corrective actions and no evidentiary support for MFP's suggestion otherwise.

R38. In proposed Findings 283, 289, 294 and 298, MFP claims that PG&E's response to corrosion on underground diesel fuel oil piping, cardox piping, and Auxiliary Salt Water piping (see PG&E Findings M-A76 - M-A85), is an example of untimely and ineffective corrective maintenance. The trouble with MFP's characterization of the record on this item is two-fold. First, MFP's entire conclusion regarding corrective actions focuses on only one issue: PG&E's determination in 1990 that cleaning and recoating the diesel

fuel oil piping, and increasing its surveillance frequency, were adequate responses to the identification at that time of corrosion on the piping. (The corrosion was identified by PG&E during performance of a ten-year Technical Specification-required inspection.) MFP seems to suggest that, based on the 1990 corrosion discovery, PG&E should have discovered corrosion on cardox and ASW piping earlier than 1992 and 1993. However, MFP points to no evidence of corrosion on the ASW and cardox piping prior to this time. And, while it is easy to second-guess PG&E's 1990 decision in retrospect, the only evidence of record is that of PG&E and the NRC Staff, both of whom agreed that PG&E's one decision in 1990 did not evidence a programmatic problem (especially since the corrosion did not affect operability of the piping). See PG&E Finding M-A81. MFP's extra-record second-guessing is of little evidentiary value.

R39. Second, MFP's findings on corrosion issues totally ignore the ample evidence in the record regarding PG&E's comprehensive response to the corrosion problems since 1992, including: repair of piping; raising piping within the trench to minimize potential exposure to standing water; replacing and moving the cardox piping inside to eliminate corrosion; and establishing a multi-disciplinary corrosion task force to inspect susceptible piping for exterior galvanic corrosion. See PG&E Findings M-A77 - M-A79. MFP's only mention of these comprehensive corrective actions is that they are "unsubstantiated" and therefore cannot be considered.

However, MFP cites no authority for ignoring such record evidence. See MFP Findings 302, 303. This evidence in fact illustrates a very effective review and response to the underground piping corrosion issue.

R40. MFP's proposed Findings 318, 323, 329, and 375 assert that PG&E's ineffective corrective actions have failed to prevent recurring problems in the control of Measuring and Test Equipment ("M&TE") used in maintenance. However, these findings rely on no more than a 1991 M&TE problem, for which PG&E received an NRC Notice of Violation, and some minor M&TE documentation deficiencies which PG&E's quality program identified in 1992 and for which PG&E has already implemented corrective actions. See PG&E Findings M-A82 - M-A85. A subsequent PG&E review found no problems, and the NRC Staff resident inspector testified that she had found no recurring deficiencies during follow-up inspections. Id. at M-A84, M-A85. Far from indicating a "pattern" of ineffective corrective actions, the uncontroverted evidence of record on this issue indicates that PG&E's own quality program was effective and thorough in identifying and correcting these minor maintenance-related deficiencies as a follow-up to a previous problem.

R41. MFP's findings on these specific 17 incidents generally reflect a myopic reading of PG&E's NCRs and LERs. As is clear from the documents of record, most NCRs and LERs include a section on "prior similar events." This is an essential part of the root

cause evaluation process, which itself is essential to identifying and implementing effective corrective actions. It cannot be inferred from the mere listing and evaluation of prior events in this process that the root causes are the same. Concomitantly, it cannot be inferred that the corrective actions for those prior events were ineffective simply because a more recent event occurred. The incident of the containment equipment hatch gap is the most extreme example of MFP's approach. This was a 1993 incident of a personnel error in which a maintenance worker failed to fully close the hatch. See PG&E Findings M-A64 - M-A66. MFP claims that PG&E's corrective actions were ineffective because there was a previous similar event ten years before and an NRC Inspection Notice fourteen years before. The record shows that in 1993 the procedure, training, and experience of the worker were all appropriate. PG&E Finding M-A66. There was no showing whatsoever as to how a single worker's personnel error somehow indicated the failure of the corrective action (revision of the maintenance procedure) for a similar event ten years before. MFP has overreached by equating widely disparate personnel errors.

R42. In another example, MFP includes under this purported "pattern" a problem relating to control of lubricants that has occurred at Diablo Canyon over the last seven years (see also MFP Finding 162). The record shows that the cited examples have been widely separated in time (1987, 1991, and 1993) and dissimilar in nature (unlabeled containers, mislabeling of grease guns, wrong oil

added to equipment -- all having little or no safety significance). MFP Exhibit 27 at 1, 10; MFP Exhibit 28 at 2-3. Again, issues such as this, particularly involving continuing personnel performance, provide little basis for sweeping generalizations regarding the effectiveness of corrective actions.

R43. Another example, addressed specifically in MFP's proposed Findings 572 and 579, is MFP's claim that personnel errors have caused five inadvertent Engineered Safety Features ("ESF") actuations at Diablo Canyon, and that these five events demonstrate that PG&E's corrective actions for such errors have been ineffective. Similarly, MFP's proposed Findings 663 and 674 conclude that personnel errors have caused six Containment Ventilation Isolation ("CVI") events and that these six events indicate that PG&E's corrective actions for the errors have been ineffective. However, the record shows that these ESF and CVI events have been isolated events involving failures by different individuals at different times to perform self-verification during particular surveillances or inadvertent errors during work around energized instrumentation. See PG&E Findings M-A174, M-A200, M-A202. In the overall context of thousands of maintenance and surveillance activities performed at Diablo Canyon annually, these isolated errors simply do not indicate a programmatic failure of corrective actions. Id. In the absence of evidence to the contrary, expert or otherwise, the uncontroverted evidence in the record is that these events are unrelated and do not reflect a

systemic problem with PG&E's maintenance and surveillance program. MFP's sweeping conclusions cannot be sustained.

R44. Finally, the evidence of record also shows that PG&E has implemented a root cause analysis program (PG&E Finding M29), and that the program is very thorough and effective (PG&E Findings M70, 76, 80, 88). This provides further assurance that PG&E has and will continue to identify effective corrective actions. The Board need not engage in an exercise of issue-by-issue "Monday-morning quarterbacking."

c. Aging Effects

R45. Next, MFP alleges the untimely detection and correction of "aging effects." MFP Findings 36-37. This general finding starts, however, from an unstated and unsupported premise that all "aging effects" can be forestalled by maintenance and surveillance. PG&E has recognized that plant structures, systems and components ("SSCs") can deteriorate as service life increases. PG&E Direct Testimony at 6 (Giffin, Crockett). Accordingly, PG&E has established maintenance and surveillance programs for the express purpose of (1) minimizing deterioration through routine maintenance, (2) predicting the rate of deterioration, (3) detecting deterioration, and (4) responding to unacceptable conditions by repair or replacement. Id. at 7; PG&E Findings M4-M5. PG&E has also specifically established aging management initiatives to mitigate the effects of age-related degradation on

SSCs. PG&E Findings M31-38. With maintenance and surveillance, including replacements and repairs, SSCs can operate safely indefinitely. See, e.g., Tr. 1741-42 (Giffin). It is unwarranted to presume, as does MFP, that simply because aging effects such as corrosion have occurred in a few cases, PG&E has acted untimely.

R46. The examples identified by MFP in proposed Finding 37 illustrate the lack of evidentiary support for MFP's global opinion that existing surveillance is not adequate to detect "corrosion" and "aging." The evidence of underground cable problems, for example, in fact relates to only two failures associated with safety-related cables. PG&E Finding M-A10. The facts show that cable problems of this sort can be and have been identified by high potential testing or, prior to any in-service failure, by a ground fault alarm. PG&E Finding M-A11. The expert testimony of record is that present surveillances are adequate. PG&E Finding M-A14. Similarly, with respect to issues subsumed within MFP's "Corrosion" category, there is no evidence of specific surveillances that should be done that are not already being done. In the cases cited in the record, PG&E specifically found and corrected the corrosion at issue before equipment operability was affected. PG&E Findings M-A75 - M-A81. MFP also relies here on degradation of the Fuel Handling Building ventilation system, another issue specifically identified and corrected by PG&E. The evidence shows that the building is subject to Technical Specification surveillance tests and that the ventilation leakage paths at issue were identified

precisely as a result of these tests. PG&E Direct Testimony at 104-5 (Crockett); PG&E Finding M-A41. Corrective actions were taken. PG&E Finding M-A42 - M-A43. With this record, it is not at all clear what MFP seeks by way of further surveillances. In sum, the evidence contradicts the proposed general finding.

R47. Other examples cited by MFP in this category are similarly irrelevant to the proposed general finding or contradicted by the evidence. The isolated failure of Limitorque valve 2-FCV-37 (due to an incorrectly installed quad ring) was not a corrosion or aging issue. See MFP Finding M-A69. The issue of IGSCC indications in emergency core cooling system accumulator tank sample and fill line nozzles was identified by PG&E and was not an exterior "corrosion" issue that could be attributed to the "salt air and water environment" as suggested by MFP. See PG&E Findings M-A72 - M-A75. The fretting of the component cooling water heat exchanger tubes was identified by PG&E during eddy current testing. See PG&E Findings M-A52 - M-A53. The "Reactor Coolant System Leakage" listed by MFP (MFP Exhibits 84 and 85) was specifically the subject of Technical Specification surveillance testing. This matter only became an issue because of a personnel error in performing that test. See PG&E Finding M-A106 - M-A107. The steam generator feedwater nozzle cracking was again not an issue connected in any way to the ocean environment. It was identified during a surveillance test. See PG&E Finding M-A159. MFP's theory that PG&E is not detecting "problems of corrosion, degradation and

aging of equipment" does not hold up under even a cursory comparison to the evidence of record. See also PG&E Reply Finding R17, above.

3. Breakdown of Multiple Barriers

R48. MFP continues its focus at the microscopic, incident-specific level with its next series of general findings related to alleged "breakdowns" in "multiple barriers." MFP Findings 38-42. In search of anything that might reach the Callaway threshold for a pervasive program breakdown, MFP attempts to find in specific cases evidence of such a breakdown. MFP's sophism in this case is that, in order for the incident to have occurred, several specific "barriers" intended to detect or prevent the problem failed. Because the incident itself occurred, there was, by MFP's lights, a "programmatic deficiency in PG&E's maintenance program." MFP Finding 38.

R49. This approach fails as a matter of law and simple logic. Of course if an incident occurred, no matter how trivial, some barriers to that incident have failed. However, it is erroneous to suggest that a breakdown of barriers at the incident-specific level equals a "programmatic deficiency" of the type envisioned by Callaway and similar cases. The Appeal Board in Callaway explicitly recognized that "defects" and "lapses" are going to occur. Callaway, ALAB-740, 18 NRC at 346. In this light, and as stated above, the Appeal Board looked to whether there was "a

pervasive failure to carry out the . . . program." Id. (emphasis added). This requires a look at programmatic, or overall, performance -- not performance in a few isolated cases. To conclude otherwise would mean that a few isolated incidents, regardless of significance and overall context, would dictate the Board's "reasonable assurance" finding. This flies in the face of logic and Commission precedent.

R50. Most of the examples cited by MFP in this context specifically involved personnel errors. PG&E has acknowledged, and it is no great surprise, that personnel errors occur. Tr. 903 (Giffin). However, from an overall perspective there is no evidence that the error rate at Diablo Canyon is excessive or has had any undue symptomatic effect (e.g., plant trips). See, e.g., Tr. 2272-73 (Miller, Narbut). In fact, the record shows that PG&E has instituted an aggressive campaign to reduce personnel errors over the last three to four years, and that PG&E devotes considerable effort to evaluating and preventing such occurrences. Tr. 892 (Giffin); Tr. 1572-75 (Vosburg). The record also shows that the error rate for 1993, as of the time of the testimony, was 1.7 per 1,000,000 hours worked, and that there has been a continuous decrease since 1989. PG&E Direct Testimony at 170-71 (Giffin, Miklush). This record does not suggest a pervasive failure of any kind.

R51. MFP's approach in these general findings, and especially with respect to the specific incidents referenced therein, also turns inside out the PG&E root cause analyses documented in the NCRs and LERs of record. The record shows that PG&E performs root cause determinations for all quality problems. These include several analysis techniques, such as cause and effect analysis, change analysis, task analysis, human factors surveys, and barrier analysis. PG&E Direct Testimony at 59 (Giffin). Stated more plainly, PG&E evaluates all the factors that could have contributed to the event as well as the barriers that are or can be provided to prevent it. Tr. 892 (Giffin); Tr. 1572-73 (Vosburg). The fact that NCRs reflect that certain barriers (e.g., self verification procedures) failed in specific cases, as alluded to by MFP, reflects no more than the fact that the event occurred and that PG&E has documented a proper root cause analysis. It simply proves nothing of programmatic significance to cite a few NCRs documenting that failed barriers occurred in specific cases.

R52. MFP's first example (MFP Finding 39) that allegedly supports the general finding is a missed surveillance for Auxiliary Salt Water ("ASW") Pump 1-2. MFP appears to be referring to a personnel error, on August 21, 1991, in which a test reviewer used an incorrect pump curve in evaluating ASW pump surveillance test results. PG&E Finding M-A97; MFP Findings 370-371. MFP would draw programmatic significance from the fact that the error was not identified by the shift foreman or the test reviewer. PG&E

addressed the personnel error by adding an independent verification to the data sheet. Tr. 1152 (Crockett). This incident, clearly isolated to its facts and addressed by procedural modifications, does not suggest a program-wide failure to carry out surveillance tests. MFP's other examples (there are six) involve similar errors. These cases do not, individually or in combination, add up to a program-wide performance problem.

4. Repetitive Patterns of Failure

R53. MFP's next attempt to find broad significance in the specific incidents it has cited focuses on "patterns of failure". MFP has combed the documents to find similar root causes, or has assigned its own similar root causes. MFP then leaps to the conclusion that incidents that share these causes are related and that this evidences ineffective corrective actions. See MFP Findings 43-61. With regard to the effectiveness of PG&E's corrective actions and its root cause evaluations, MFP has of course again ignored the overall assessments of record cited above. Furthermore, simply reciting broad root cause descriptions (e.g., personnel error) does not establish a link between incidents. There is no testimony of record with respect to any of MFP's categories of documents that supports the notion that corrective actions for one category should have prevented an incident addressed in another category.

R54. Even accepting the groupings of these incidents or categories into the "patterns" MFP perceives, the evidence does not add up to a finding of a pervasive program implementation problem. MFP's argument here is truly a "numbers game." See PG&E Findings M84-M95. Counting beans in each jar is, of course, an approach completely devoid of substance. It precludes recognition of the minor nature of the individual items and disallows intelligent consideration of the overall context. But even so, the numbers MFP has provided for each of its "patterns" are woefully insufficient to suggest programmatic implementation problems. The very few cases cited -- drawn from two operating units -- truly are the exceptions when one considers the vast number of maintenance and surveillance tasks performed each year. See PG&E Finding 85.

a. Lack of Communication and/or Coordination

R55. MFP suggests, in Finding 44, that "PG&E's maintenance and surveillance program is deficient in its communication and coordination between different groups of individuals and/or departments." There is of course no testimony or assessment of record that suggests such a program deficiency, and MFP cites none. The NRC Staff inspectors never testified to such a systemic problem. No SALP report includes such a finding. And Mr. Dillard did not observe this alleged condition. In fact Mr. Dillard made several observations that are directly contrary. He noted that the plant staff he spoke with were well aware of various responsibilities. PG&E Direct Testimony at 124 (Dillard). He also

observed that the "efficient outages Diablo Canyon has had show how effective PG&E has been, as this is a major effort coordinating several thousand activities in a sixty-day period." Id. Mr. Dillard also cited several specific programs wherein PG&E coordinates people and organizations very effectively. Id. at 156-58. MFP's proposed finding simply lacks support in the record.

R56. MFP would circumvent the problem of a lack of record support by focusing on minor incidents for which a PG&E NCR may have referenced a lack of communication, coordination, or management involvement to be a factor. MFP Finding 46. However, the purported grouping does not work. At the threshold, the concepts of coordination, communication, and management involvement are by definition very broad. The factual circumstances of the cases cited by MFP, the people and the organizations involved, and the issues raised, are simply too diverse to sustain such a grouping. Without any evidentiary support, it is impossible for the Board to conclude that issues as diverse as the motor pinion keys in Limitorque motor operators (PG&E Findings M-A182 - M-A184), radiological controls during steam generator shot peening (PG&E Findings M-A162 - M-A166), and the control of lifting and rigging devices (PG&E Findings M-A185 - M-A191), are somehow related or somehow reflect a common deficiency. The evidence of record fails to establish even any connection between the two incidents within the last category above (lifting and rigging). PG&E Finding M-A190.

R57. Moreover, even MFP implicitly recognizes in proposed Finding 46 that communication, coordination, and management involvement were not necessarily root causes of the incidents it cites; they may (according to MFP) have only "played a role." For example, in Finding 45 MFP cites an isolated inoperability of the Auxiliary Building Ventilation System. The fact that PG&E may have referenced -- as part of a thorough analysis -- that a personnel error involved in part "poor communication" has little generic importance. The circumstances were unusual. PG&E Finding M-A58. Moreover, communications was not the root cause of the event. PG&E Finding M-A59. There is no basis to draw a connection between this issue and any of the other issues that MFP alleges establish a pattern. Absent a connection, there is no basis to suggest a general program deficiency.

R58. Finally, it is again worth noting that the evidence of record does not even establish that many of the incidents included here by MFP were significant "problems." For example, the condition of the "seismic clips not installed" was shown to have no effect on system performance. PG&E Finding M-A133. The incidents involving unsecured electrical panels were also evaluated and determined to have no potential safety impact. PG&E Findings M-A61, M-A62. MFP's reliance on such minor matters (and these are not the only two) to make global programmatic findings is simply misplaced.

b. Previous Maintenance Errors Caused Undetectable Problems

R59. MFP would have the Board conclude that "PG&E has demonstrated a pattern of creating undetectable failures through improper maintenance." MFP Finding 47. MFP cites five cases in which it alleges that this occurred. However, even if one were to accept the factual premise regarding the five incidents, the conclusion MFP draws does not follow. Five incidents in the overall context hardly creates a "pattern." And even more importantly, it does not suggest "a pervasive failure to carry out the . . . program. . . ." Callaway, ALAB-740, 18 NRC at 346. Nor does MFP -- or any witness of record -- find behind this alleged "pattern" any specific, unifying "fundamental flaw" in the Diablo Canyon maintenance or surveillance program. Compare Shoreham, ALAB-903, 28 NRC at 505-6 (minor or isolated problems do not constitute a fundamental flaw unless associated with a particular program element that must be "reassessed and reconceived to a significant extent"). Absent such a showing on the record, MFP cannot in findings breathe programmatic significance into these isolated occurrences.

R60. The factual premise cited by MFP for this general finding also has significant difficulties -- difficulties that seriously undermine the integrity of MFP's findings. MFP alleges that improper maintenance led to "undetectable failures" (MFP Finding 47), but then concedes that some of these "failures" were in fact detected "through testing" (MFP Finding 48). For example, the

failure of Limitorque 2-FCV-37 to close was detected during a routine surveillance. This issue is an example of surveillance working as intended. PG&E Finding M-A69. Similarly, the issue addressed in the category "Diesel Generator Failed to Achieve Rated Voltage" was detected by PG&E during post-maintenance surveillance testing. This was another example of the program working as intended. PG&E Findings M-A93 - M-A94. Also, the "Limitorque Valve Failure" included in this "pattern" was in fact detected during surveillance testing. PG&E Finding M-A178; MFP Finding 590. The Board on this record obviously cannot find a pattern of "undetectable" failures.

R61. The testimony of record also does not support MFP's findings on the inoperable high pressure turbine stop valve (MFP Findings 356-358) or its inclusion as part of this purported "pattern" (MFP Finding 48). Contrary to MFP's findings, the testimony is clear that this condition, regardless of the root cause, was <u>not</u> the result of a maintenance activity. Tr. 1126-28 (Vosburg); PG&E Finding M-A90. MFP's proposed Finding 356 cites the transcript (Tr. 1133-34), but mischaracterizes that testimony in suggesting that the witness testified that the condition could have been caused during maintenance. He did not. Furthermore, MFP's proposed Findings 357 and 358 ("PG&E may have caused . . .") are blatantly speculative and without evidentiary basis. Again, the record simply does not support the general findings MFP proposes.

c. Inadequate/Improper Surveillance

R62. MFP next proposes that "routine surveillances, tests and inspections at [Diablo Canyon] are inadequate to ensure the continued safe operation of the plant." MFP Finding 49. This finding can be dismissed out of hand. There is no evidentiary support for the notion that some further surveillance programs beyond those presently required by Technical Specifications or existing procedures is necessary. PG&E described its existing programs and no witness stated that those programs were insufficient. See PG&E Findings M9-M12.

R63. MFP also argues that the various documents of record show a "pattern" of "missed surveillances, improperly performed tests and a lack of monitoring activities," citing 17 categories. MFP Finding 50. MFP has again grouped some very diverse circumstances under one very broad umbrella. Again there is no evidence of record that links these categories, such as by a common and fundamental surveillance program flaw. For lack of a unifying bond, the "pattern" theory does not hold.

R64. Even when viewed individually, these incidents do not suggest fundamental surveillance deficiencies. PG&E has evaluated each of the incidents listed under this finding. PG&E's Findings on each issue reference the record that establishes the isolated nature of the various incidents or issues, the lack of safety significance, and, where necessary, the adequacy of existing

surveillance practices. See generally PG&E Findings at Appendix A. This is particularly true with respect to issues such as check valve testing (PG&E Findings M-A6), underground cable failures (PG&E Findings M-A14, M-A18), steam generator feedwater nozzle cracking (PG&E Findings M-A158 - M-161), and Chemical and Volume Control System valve leakage (PG&E Findings M-A243 - M-A246). There is no need to repeat those PG&E findings here.

R65. MFP also includes in this alleged "pattern" such disparate issues as a minor typographical error in a procedure (PG&E Findings M-A100 - M-A101), an intermittent equipment problem with a reactor cavity wide range level indicator that reflected only peripherally on the surveillance program (PG&E Findings M-A110 - M-A116), a broken testcock valve on a diesel generator with no safety significance or programmatic implications (PG&E Findings M-A216 - M-A219), and the radiological controls implemented as a health physics activity during steam generator shot peening (PG&E Findings M-A162 - M-A165). These matters can be dismissed summarily under the relevant standard of review.

R66. MFP also includes in this list several isolated instances involving missed Technical Specification surveillances. These instances likewise do not suggest a "pervasive failure" to implement a surveillance testing program. Callaway, ALAB-740, 18 NRC at 346. The missed surveillances cited by MFP, often attributable to personnel errors, are in fact very few in number in

the overall context and very minor in their significance. See, e.g., PG&E Findings M-A45 - M-A51; M-A95 - M-A99; M-A125 - M-A129. These matters are entitled to no weight at all on the relevant programmatic issue.

d. Personnel Errors

R67. MFP's next purported "pattern" rests on the purported "occurrence of many personnel errors during the past several years." MFP Finding 54. This finding, however, is devoid of evidentiary support and programmatic significance. As discussed above in Reply Finding R24, personnel errors are an anticipated occurrence in the operation of the plant. The occurrence of a few such errors does not suggest a systemic program problem. Nor does this suggest, in and of itself, a negative "pattern." In the case of Diablo Canyon, as cited above, there is no testimony suggesting a personnel performance problem. See Reply Finding 50, above. Likewise, there is no evidence that the incidents cited by MFP in its proposed Finding 54 were repeat occurrences, involved any common link, or had more than very low potential safety significance. See generally PG&E Findings at Appendix A. The Board must conclude that MFP has not shown any "pattern" beyond what might be expected, has not shown any common thread suggesting a particular program flaw, and has not shown in these incidents any programmatic significance.

R68. The Board should also note here that the alleged "pattern" on personnel performance is in reality an attempt to admit through the back door a contention previously rejected in this proceeding. In LBP-93-1, dated January 21, 1993,[9] the Board rejected proposed Contention II, noting that "unrelated and widely disparate personnel incidents do not appear to amount to a failure of either the personnel program or related training programs." 37 NRC at 23. The same is true with the present incidents involving personnel errors, particularly given the evidence with respect to PG&E's very good programmatic performance.

e. Inadequate Procedures

R69. The next alleged "pattern" concerns supposedly inadequate procedures or work instructions. MFP Finding 55. MFP, citing several categories of the documents it introduced relating to specific isolated incidents, claims "that in recent years, a significant number of incidents have been identified in which inadequate procedures, instructions or guidelines were provided to the personnel performing the maintenance activities and which contributed to the occurrence of these events." MFP Finding 56. This proposed finding, however, is also premised on faulty logic and is undermined by contrary evidence.

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[9] "Prehearing Conference Order (Ruling Upon Intervention Petition and Authorizing Hearing)," LBP-93-1, 37 NRC 5 (1993).

R70. First, MFP's theory rests primarily on numbers (i.e., the "numbers game"). See MFP Finding 56 (which explicitly rests on "the number" of incidents). However, as discussed previously, the evidence is quite clear that MFP's numbers do not add up. PG&E's performance in maintenance and surveillance has been quite good as reflected in the overall program assessments. In context, the incidents that have occurred -- whether due to inadequate procedures or to any other cause -- are neither "pervasive" nor particularly safety significant. See PG&E Findings M84-M94; see also Reply Findings R3-R4, R11, above. It is not logical to conclude that PG&E's high level of operational performance, as well as departmental performance, could have been achieved with pervasively inadequate work instructions or procedures. The general evidence in this case directly refutes the conclusion MFP would draw from the specific. See also PG&E Direct Testimony at 136-137 (Dillard).

R71. Second, MFP's listing of specific incidents to support this purported "pattern" significantly distorts the record. As stated previously, the testimony and evidence shows that PG&E has a very aggressive root cause evaluation process. See Reply Finding R12, above. In some of the NCRs and LERs introduced by MFP, particularly those involving personnel errors, the root cause analysis indeed references "inadequate" procedures or instructions. However, the PG&E witnesses specifically explained the philosophy inherent in these evaluations. PG&E closely examines an incident

to learn from the experience and to incorporate procedure changes where possible to help prevent a similar occurrence. Tr. 1572-74 (Vosburg). However, this does not mean that the procedure was defective the way it was. Id. at 1574. In fact, in many cases, such as that involving an auxiliary feeder breaker failure due to a misalignment during an overhaul, a procedure was improved based on the experience, but in fact had been successfully performed many times previously. Id. at 1594-95 (Ortore, Vosburg); see also Tr. 902-4; 906-7 (Giffin), 909-10 (Giffin, Vosburg) (describing procedural enhancements to address personnel error in closing the containment equipment hatch). The type of self improvement documented repeatedly in the exhibits introduced by MFP does not suggest a systemic problem, but rather a strength. Tr. 1483 (Dillard).

R72. The "Limitorque Valve Failure," MFP Exhibits 128 and 129, also illustrates the error in MFP's proposed general finding. This issue involved a failure of a Limitorque valve operator during a test due to an improperly assembled spring pack. PG&E Findings M-A176 - M-A178. The root cause of the incident was, on the face of the exhibits, a personnel error. MFP Exhibit 128 at 4; MFP Exhibit 129 at 4. Procedures for performing the assembly were listed only as a contributing factor. Id. To minimize future errors, the procedures were enhanced; they were not reassessed or reconceived to any extent. The Board cannot conclude on this

record that procedures are pervasively inadequate, much less fundamentally flawed. See Shoreham, ALAB-903, 28 NRC at 505-6.

R73. MFP also includes in this alleged "pattern" incidents that on their face are isolated, such as a Limitorque motor operator failure that occurred in May 1990 during a valve test ("SI-1-8805A Failed to Cycle on Actuation Signal") due to the incorrect installation of a dec ork in the operator. See PG&E Findings M-A235 - M-A239. The MER on the incident finds that the error was "an isolated incident." MFP Exhibit 210 at 6. Absent any expert testimony to the contrary, imply attempts to stretch the facts of minor incidents too reach a generic conclusion.

R74 Finally, MFP includes under this general finding several broad issues, such as "Corrosion" or "Cont of Foreign Material," that require continuing personnel vigilan These matters have been addressed by PG&E from a programmatic perspective. See PG&E Findings M-A76 - M-A81, M-A145 - A156. Issues such as identifying and addressing corrosion and minimizing foreign material involve much more than procedures. There is no evidence that there is any continuing procedural deficiency in these areas. Compare Shoreham, ALAB-903, 28 NRC at 505-6. Specific corrosion issues discussed at the hearing were identified by PG&E (PG&E Finding M-A81) and further measures have been taken and/or are under study to address this issue (PG&E Finding M-A79). With respect to debris issues, it

is very clear that MFP has grouped some very different issues and that each of these issues has been addressed at a programmatic level (e.g., PG&E Finding M-A156). MFP has provided no specific suggestions -- with expert support -- on how a specific perceived problem would be addressed by a specific procedure change. There is no basis on which to conclude that PG&E's existing procedures are pervasively inadequate.

f. Manufacturing Deficiencies and Internal Defects

R75. MFP's next proposed general finding is that "PG&E does not have an effective program for detecting manufacturing deficiencies or internal defects." MFP Finding 57. To the extent this finding relates to "manufacturing and/or vendor deficiencies," it can be dismissed out of hand. This is not a maintenance or surveillance issue of the type contemplated when the Board admitted Contention I. The focus of the basis for Contention I, and the Board's focus in admitting the contention, was on whether PG&E is adequately conducting maintenance and surveillance with respect to installed structures, systems, and components. LBP-93-1, 37 NRC at 15-16, 19-20. The Board specifically excluded from litigation a proposed contention directed at the surveillance and control processes involved in the procurement of replacement parts. Id. at 24. There was and remains no basis for the assertion that the current procurement process is insufficient.

R76. With respect to continuing surveillance to detect internal defects and failures, the proposed finding is not supported by the record. There is no evidence to support MFP's premise that all internal "defects" can or need to be detected. Surveillance tests such as those required by Technical Specifications are intended to establish equipment operability. These tests assure that safety-related equipment failures or substandard equipment performance will not remain undetected, and that the equipment will remain capable of its intended function. PG&E Direct Testimony at 11-12 (Crockett, Giffin). There are over 10,000 such Technical Specification-required tests performed each year at Diablo Canyon. Id. at 11. If an internal condition does not cause an operability problem, it may not be detected, but it is also of no safety significance.

R77. MFP's list of incidents specifically includes several incidents wherein the alleged internal defect in fact had no operability effect. The potential for sheared motor pinion keys in certain Limitorque motor operators is one example. PG&E determined that even with sheared keys the operator would perform its function. See PG&E Finding M-A183. The Limitorque operator with the mis-installed declutch fork is another example. The operator worked properly for approximately eight years. PG&E Finding M-A237. When the internal conditions in this case finally led to an operability problem, the failure occurred and was detected during a surveillance test. PG&E Finding M-A236.

R78. The proposed general finding is also overbroad in scope, suggesting no specific procedures that need be adopted. In contrast, it is based on a list of incidents (MFP Finding 59) that is indeed very short when viewed in the overall context. No witness testified to a programmatic surveillance deficiency in this area or suggested areas where improvements were needed. In fact, if internal defects were a problem, one would expect a high rate of component failures. The NRC Staff witness observed that the component failures of record at Diablo Canyon do not stand out in any way, and that in fact they reflect a much lower level of significance than for other plants. Tr. 2273 (Miller).

R79. MFP also lists as support for this general finding the episode involving a broken testcock on a diesel generator cylinder. See PG&E Findings M-A216 - M-A219. This is simply a very minor issue; one that would not significantly affect operation of the diesel generator and one that by no rational stretch can be said to indicate a program deficiency. Id. at M-A219.

R80. MFP's own exhibits also help to disprove this general finding. MFP includes as part of this "pattern" the July 1992 incident involving the hold down motor bolts in Centrifugal Charging Pump 2-1. This case involved a manufacturing discrepancy that was identified by PG&E during preventive maintenance. It was corrected. PG&E Finding M-A103. This example of a surveillance and maintenance program working as intended, in itself disproves

MFP's theory. Similarly, the Limitorque valve failure addressed in MFP Exhibits 128 and 129 (which was the result of an isolated error during maintenance), occurred precisely during a surveillance test. PG&E Findings M-A176 - M-A178. It is certainly misleading, if not disingenuous, to suggest that these examples somehow prove a "pattern" of insufficient surveillance.

g. Financial Considerations

R81. MFP's next proposed general finding, and indeed a recurring theme throughout its document, is that PG&E's maintenance program is "unduly influenced by economic considerations." MFP Finding 60. This proposed finding addresses an issue outside the scope of this proceeding. PG&E for this reason moves that it, and all similar specific findings, be stricken. Furthermore, the proposed finding is in any event simply not supported by any reasonable reading of the record.

R82. Financial issues in general are outside the scope of this proceeding. See, e.g., 10 C.F.R. § 50.33(f).[7] Similarly, PG&E's rate agreement -- a constant MFP subtext in its proposed findings -- is a matter outside the NRC's jurisdiction. See, e.g.,

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[7] In promulgating its financial qualifications rules in 1984, the Commission eliminated financial qualifications reviews for electric utilities, such as PG&E, in connection with operating license reviews. The NRC found no proven link between financial issues in the abstract and operational safety, given the assumption that funds would be available or plant operation would be stopped. See 49 Fed. Reg. 35,747, 35,749 at col. 1 (1984).

Tennessee Valley Authority (Watts Bar Nuclear Plant, Units 1 and 2), ALAB-413, 5 NRC 418, 1420-21 (1977); (economic and rate interests are outside zone of interest protected by the Atomic Energy Act); see also Tr. 815 (J. Bechhoefer) (Board disallowed MFP questions regarding the rate structure for Diablo Canyon and purported impacts on department budgets); Tr. 2119-20 (J. Shon) (Board excluded evidence related to ratemaking). For these reasons alone, the proposed findings can be summarily rejected.

R83. Also, even assuming financial constraints were causing inadequacies in maintenance and surveillance, it would be incumbent upon MFP to show such a specific inadequacy. This it has failed to do. Again, the programmatic evidence shows a well-functioning maintenance program at Diablo Canyon. There is nothing "undue" or improper in the mere fact that the Maintenance Services Department has a budget. See, e.g., Tr. 810-11 (Giffin).

R84. The examples given by MFP of allegedly "undue" financial constraints (MFP Finding 61) simply do not show improper consideration of costs or inadequate maintenance or surveillance. None of the examples involves a situation in which cost dictated actions (or lack of actions) contrary to regulations, the license, or safety. As stated by the PG&E Manager of Maintenance Services in the context of the emergency core cooling system accumulator tank IGSCC issue (relied upon here by MFP), PG&E did not "put off required maintenance." Tr. 940 (Giffin). A specific option that

was discussed internally, and eventually not selected based on, among other things, cost, was specifically evaluated. The witness testified that "it was determined that we didn't have to do this at that time and we didn't." Id. The evidence is quite clear, including the testimony of the NRC Staff witnesses, that PG&E in fact addressed the technical issue in this case very well. PG&E Finding M-A75. The fact that different, and more costly, actions were not taken is simply irrelevant.

R85. Another good example of the specious nature of MFP's argument here is the incident involving a fire in an electrical panel in 1990. The uncontroverted evidence is that this was an isolated occurrence due to one faulty compression termination. The compression termination technique involved has in fact been used, without other incidents, for ten years. PG&E Findings M-A240 - M-A242. Yet MFP mischaracterizes the record in MFP Finding 767 by describing the terminations generically as "the faulty connectors." Then MFP faults PG&E for not replacing these connectors for "financial reasons." However, in light of the evidence of the very low failure rate (PG&E Finding M-A241), the low safety significance (MFP Exhibit 216 at 6), and the other actions taken by PG&E to prevent recurrence (PG&E Finding M-A242), it is MFP's logic and proposed findings that are faulty.

R86. Interestingly, MFP also includes as support for this general finding at least two findings where there is no evidence

cited by MFP anywhere that suggests financial pressures as a factor, much less an "undue" factor, leading to alleged inadequate maintenance. In Finding 61 MFP includes the CFCU issue. However, MFP's specific findings on that issue (MFP Findings 473-508) do not discuss or draw any link to costs. Similarly, MFP Finding 61 cites the Fuel Handling Building issue, but MFP's specific findings on that issue (MFP Findings 167-184) do not cite any evidence suggesting a lack of action that occurred due to cost considerations. The Board can only conclude that this is a misleading attempt to bolster an unsupported proposed finding.

C. MFP's Specific Findings

R87. With respect to the individual incidents addressed in the documents introduced by MFP, the record includes discussions of root causes, safety significance, and corrective actions planned or completed for each. See generally PG&E Findings at Appendix A; see also Tr. 696-8 (J. Kline). Without contrary evidentiary support, the Board need not, as MFP proposes, go beyond the four corners of the documents to make independent findings with respect to these matters. Under the Callaway and Shoreham precedents, the Board need focus only on whether the documents demonstrate either a pervasive implementation failure or some fundamental program flaw for which corrective actions are not being taken. These material issues have already been addressed for each category of MFP exhibits in PG&E's Findings, particularly in Appendix A.

R88. MFP in its proposed findings has abandoned ten issues that were addressed at the hearings and were discussed in PG&E's Findings, Appendix A. These are: High Radiation Area Entries (PG&E Findings M-A23, et seq.); Reactor Coolant System Hydrogen Sampling (PG&E Findings M-A30, et seq.); Auxiliary Feedwater Pump Discharge Valve (PG&E Findings M-A35, et seq.); Testing of CVI Response Time (PG&E Findings M-A37, et seq.); Inadvertent Dilution of Boron (PG&E Findings M-A55, et seq.); Overtime Restriction Violations (PG&E Findings M-A86, et seq.); Shelf Life Non-Issue (PG&E Findings M-A130, et seq.); Auxiliary Feeder Breaker Failure (PG&E Findings M-A179, et seq.); Low Vacuum Turbine Trip (PG&E Findings M-A204, et seq.); and Maintenance Personnel Qualifications (PG&E Findings M-A220, et seq.). These issues should be deemed to be waived. This leaves only 45 NCR/LER issues raised by MFP.

R89. There is no basis to conclude from the exhibits introduced by MFP that there has been a "pervasive failure" to implement appropriate maintenance and surveillance programs at Diablo Canyon. Callaway, ALAB 740, 18 NRC at 346. The vast majority of issues cited by MFP are minor matters for which the NRC Staff did not even take enforcement action. Moreover, the number of issues cited is, in context, relatively small. Likewise, there is no basis to conclude from the documents introduced by MFP that there is some "fundamental flaw" in the program that would require any aspect of the program to be "reassessed and reconceived to a significant extent." Shoreham, ALAB-903, 28 NRC at 505-6. To the

contrary, the documents show an effective process at Diablo Canyon for identifying program enhancements and for implementing corrective actions when necessary. See PG&E Findings M84-M95.

R90. Moreover, because MFP's general findings fail to substantiate any overarching theme in the exhibits introduced by MFP, no purpose is served by analyzing each of the individual incidents addressed in the documents. Nonetheless, although not necessary to reach a decision on this contention, detailed reply findings on an issue-by-issue basis are included in Appendix A attached hereto. These reply findings address some of the more egregious errors and mischaracterizations made by MFP.

III. CONTENTION V: THERMO-LAG COMPENSATORY MEASURES

R91. The scope of Contention V is correctly stated in PG&E's Findings T1-T3. The issue admitted in this proceeding is whether PG&E is adequately implementing and adhering to the interim compensatory measures required by the NRC in connection with the use of Thermo-Lag as a fire barrier. See, e.g., "Memorandum and Order (Discovery and Hearing Schedules)," dated February 9, 1993, at 2.

R92. MFP's proposed findings on this contention (MFP Findings 798-838) are a long and irrelevant discourse on minor incidents that allegedly created "a significant reduction in PG&E's defense-

in-depth fire protection program." MFP Finding 838. There is, however, no meaningful or factually correct nexus ever drawn between these alleged "reductions" and the Thermo-Lag compensatory measures at Diablo Canyon.

R93. PG&E's Thermo-Lag compensatory measures are, as at other nuclear plants, primarily fire watches. The fire watch is either continuous or roving depending upon the availability of fire detection in a given area. PG&E Finding T10. MFP, however, does not in any way confront the success of PG&E's implementation of fire watches in the Thermo-Lag areas (and indeed in all fire areas of the plant). The evidence on these points is unequivocal and uncontroverted. PG&E Findings T23-T26. MFP's proposed findings effectively concede that the record demonstrates PG&E's successful implementation of compensatory fire watches in Thermo-Lag areas.

R94. Instead, in proposed Finding 789, with a deft stroke of the word processor, MFP leaps from the narrow contention as admitted, and a related Board evidentiary ruling, to an expanded view of the contention that would include "all aspects of the fire protection program" at Diablo Canyon. Contrary to MFP's argument, however, the compensatory measures at Diablo Canyon are what they are, as reflected in the record; they are <u>not</u> the entire fire protection program. MFP may not by wishful thinking rewrite either Contention V or the evidence.

R95. MFP's entire argument on the contention nonetheless reduces to a relatively few incidents and temporary fire protection impairments as referenced in five exhibits (MFP Exhibits F1A, F2, F3, F5, and F6). The incidents relate, for example, to a damaged ceiling tile, temporarily impaired sprinklers, detectors, and barriers, and a malfunction of the fire protection computer. These exhibits provide no basis to question the success of PG&E's implementation of interim compensatory measures. None involve a failure to perform a compensatory fire watch in a Thermo-Lag area. PG&E Finding T34. Nor do any suggest other programmatic fire protection problems at Diablo Canyon. See PG&E Findings T35-T39. MFP's proposed findings on these relatively minor incidents are misguided and must be summarily rejected.

IV. CONCLUSIONS OF LAW

For the reasons stated above, PG&E's previous proposed findings of fact with respect to both Contention I and Contention V are based upon the correct standard of review to be applied, upon a proper reading of the contentions at issue, and upon a correct weighing of the relevant evidence. Given their proper focus and perspective, PG&E's proposed findings of fact accurately and succinctly reflect the record in this proceeding. MFP has provided no supportable basis for relief.

At several places in its proposed findings, MFP expresses a lack of confidence that future or ongoing actions mentioned by PG&E will be taken or completed. However, none of these actions are essential to the Board's required programmatic findings. Moreover, as a matter of law, regulatory mechanisms exist to assure that licensee commitments are met. See, e.g., Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), ALAB-788, 20 NRC 1102, 1124-26 (1984). These matters can properly be left to the NRC Staff for confirmation in the normal regulatory process. Id. at 1159-60.

Accordingly, PG&E's proposed conclusions of law, as set forth at pages 81-82 of its proposed findings, can be adopted without change.

Respectfully submitted,

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Dated in Washington, DC
this 30th day of December, 1993

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:	)	
	)	Docket Nos. 50-275-OLA
Pacific Gas and Electric Company	)	50-323-OLA
	)	(Construction Period
(Diablo Canyon Power	)	Recapture)
Plant, Units 1 and 2)	)	
	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of "PACIFIC GAS AND ELECTRIC COMPANY'S REPLY FINDINGS OF FACT AND CONCLUSIONS OF LAW" in the above-captioned proceeding have been served on the following by deposit in the United States mail, first class, this 30th day of December, 1993. A copy of this document in WordPerfect 5.1 format has also been provided to Judge Bechhoefer.

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:	)	
	)	Docket Nos. 50-275-OLA
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	)	(Construction Period
(Diablo Canyon Nuclear Power	)	Recovery)
Plant, Units 1 and 2)	)	
	)	

PACIFIC GAS AND ELECTRIC COMPANY'S
REPLY FINDINGS OF FACT AND
CONCLUSIONS OF LAW

APPENDICES

APPENDIX A: DETAILED REPLY FINDINGS -- SPECIFIC INCIDENTS AND ISSUES RAISED BY MFP

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APPENDIX A

DETAILED REPLY FINDINGS -- SPECIFIC
INCIDENTS AND ISSUES RAISED BY MFP

The following are specific reply findings directed at MFP's proposed Specific Findings on Contention I (Findings 62-784). These reply findings are not intended to be all inclusive. Rather, reference should be made to PG&E's initial proposed findings on each incident or category cited by MFP (see PG&E Findings, Appendix A). Furthermore, these reply findings highlight only some of the more egregious errors and mischaracterizations made by MFP. Failure to address a specific MFP proposed finding here should not be viewed as acceptance of that finding.

Maintenance of Environmental Qualification of Electrical Equipment

R-A1: Apart from NCR/LER issues, MFP dwells at length on a matter related to environmental qualification of electrical equipment. MFP Findings 62-107. At the outset, it is clear that the design and analytical aspects of environmental qualification are inadmissible in this proceeding. See, e.g., LBP-93-9, 37 NRC at 449. MFP nonetheless focuses, under the guise of maintenance, on the use at Diablo Canyon of telatemp monitoring stickers to address local temperatures. This is a matter for which the sole maintenance function is to read, remove, and replace the stickers during refueling outages. PG&E Finding M44; Tr. 1847, 2041 (Ortore). Without evidentiary support, MFP attempts in findings to imbue this program with heightened significance and with precision

that far exceeds what is required by regulation or by prudent engineering. Moreover, MFP has failed to provide any evidence that affirmatively establishes that there is electrical equipment not qualified by virtue of local temperature effects.

R-A2: As explained by the witnesses, PG&E has proactively addressed the operating environment for electrical equipment required to be environmentally qualified. The Diablo Canyon plant was designed as a large and uncongested plant, with design features such as ventilation and routing of power cables that mitigate the likelihood and impact of temperature "hot spots." PG&E Finding M45. Nonetheless, even before the NRC generic Information Notice referenced by MFP, PG&E hired Sargent and Lundy to identify any temperature "hot spots." PG&E Finding M41. As a result, areas of localized temperature conditions were addressed early in the life of the plant. Id. The telatemp monitoring program was adopted as a confirmatory measure and has proven to be precisely that. PG&E Finding 45.

R-A3: In Finding 65, MFP states that "[i]f the normal operating temperature exceeds the temperature assumed in originally qualifying the equipment, the qualified life must be shortened and the equipment must be changed out earlier than originally expected. Tr. at 1843-44." This statement, however, is erroneous. The use of the words "the qualified life must be shortened" in the proposed finding is a misquote of the transcript reference, where the PG&E

witness responded affirmatively to a question which asked only whether the qualified life of equipment "may need to" be reduced in the event the operating temperature exceeds the temperature assumed when the equipment was environmentally qualified. Tr. 1843 (Ortore). Whether the qualified life in fact needs to be changed as a result of the operating temperature data is dependent on analyses by Engineering personnel (not Maintenance personnel), considering all factors which enter into the calculation of qualified life. Tr. 2041 (Ortore). The uncontroverted record shows that PG&E's experience has been that very few changes in the existing qualification of equipment have been required based on the telatemp data. PG&E Finding M45.

R-A4: MFP argues in its proposed Finding 76 that, "[a]nother reason for the need for conservatism in evaluating the temperature readings is that some safety equipment is extremely vulnerable to temperature changes. As the NRC noted in Information Notice 89-10, 'Electrical cables are vulnerable to degradation when exposed to high temperatures that exceed their design EQ temperature even for a short period.'" However, this MFP "testimony" is irrelevant. Aside from the fact that MFP failed to introduce NRC Information Notice 89-30 (not 89-10) into evidence, there is no evidence in the record that indicates that any specific electrical cables at Diablo Canyon have been vulnerable to degradation due to operating temperatures, or have suffered actual degradation due to such temperatures, or have been exposed to high

temperatures which have exceeded their design qualification temperatures without appropriate engineering analysis and revision to their qualified life. In fact, as discussed above and contrary to the implication of this proposed finding, PG&E witnesses testified that PG&E has addressed possible qualification effects of localized temperatures at Diablo Canyon, beginning even before the issuance of Information Notice 89-30. See PG&E Findings M40-M42, M45.

R-A5: MFP argues (in Finding 77) with PG&E's testimony that there have been "very, very little changes in temperature over our operating experience." Tr. at 2043 (Ortore). MFP's proposed finding, however, is an opinion conclusion unsupported in the record. MFP cites, out of context and with no explanation of record, selected telatemp temperature reading variations for certain valves and conduits. Without any expert opinion or other record support, MFP then argues that the variations are significant enough to contradict the unrebutted testimony to the contrary by PG&E's witnesses. See Tr. 1864-5 (Ortore). However, MFP's extra-record attempt to characterize unilaterally the significance of random and unexplained telatemp readings must be disregarded.[1]

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[1] If MFP had intended to impeach the testimony of the witness regarding temperature variations, it should have confronted the witness with the purportedly impeaching evidence. This would have allowed a proper opportunity for explanation or rehabilitation on redirect. Cf. FED.R.EVID 613(b); see 98 C.J.S. § 642 (1977).

R-A6: MFP also questions the reliability and accuracy of the telatemp stickers. See MFP Findings 78-79, 81-91. However, by and large, MFP never focused on a global theory with respect to this data at the hearing or offered testimony to interpret the telatemp sticker data which it introduced. Cf. Tr. 697-8 (J. Kline) (emphasizing MFP's burden of pointing out a theory as the record is developed). In fact, MFP's request for telatemp stickers (beyond those for a few components requested in discovery) was not even made until the day of the hearing. See NRC Staff Findings 5-8; I-61 (discussing the need to identify documentary evidence supporting its theories prior to hearing). MFP effectively left the parties in the dark as to its opinions on this data. MFP did not seek an explanation, nor did it introduce or ask questions about other information on qualified equipment that might have been available, such as the component maintenance histories or any continuous temperature monitoring data. In its failure to develop a record, MFP has not convincingly made any case with the selected telatemp records introduced. See also NRC Staff Finding I-119.[2]

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[2] MFP, which effectively invited the "hole" in the record it now alleges by its failure to present direct testimony and to conduct fair cross-examination, cannot now complain that there are unanswered questions or unexplained inconsistencies. In an analogous appellate context, it is hornbook law the "[P]arties must abide by the consequences of their own acts and cannot seek a reversal of a case upon appeal for errors which they had committed or invited." Hudson v. Wylie, 245 F.2d 435, 448 (9th Cir. 1957), quoting Noble v. Miles, 129 Cal. App. 724, 19 P.2d 265, 266.

R-A7: When MFP did focus the witness's attention on specific temperature data variations in the telatemp records, the witness was able to explain. For example, in MFP Finding 78, MFP addresses variations in telatemp readings for valve FCV-38. However, the witness explained that valve FCV-38 is not in the environmental qualification program, rendering the discussion irrelevant. Tr. 1882 (Ortore). MFP also focuses now on temperature data for valve 8000B versus valve 8000A. The PG&E witnesses explained, however, that telatemp stickers register only the highest temperature recorded, without regard to how long the temperature lasted. Tr. 1851-52 (Ortore). Certain valves are subject to very high temperature for a very short time while the valves are being "burped." Tr. 1864-65 (Ortore). This experience will not, upon evaluation, affect qualified life of the equipment. PG&E also explained that where data is ambiguous, it will use continuous temperature recording devices for some period of time to complete the qualification analysis. Tr. 1851 (Ortore). Other temperature variations on a single component are explainable by the fact that the stickers are placed on more than one location on the component. Tr. 1850 (Ortore).

R-A8: MFP also argues (MFP Finding 92) that PG&E's procedures for telatemp sticker installation are "confusing." MFP offered no expert testimony on this subject, and no PG&E or NRC Staff witness testified that PG&E's telatemp procedures were "confusing." In fact, PG&E's witnesses testified repeatedly that

any confusion by MFP's counsel in reading the telatemp records was not attributable to the procedure itself, but to the fact that, in the normal course of the program, the procedure has gone through several revisions, only the latest of which was introduced into evidence by MFP. See Tr. 1884, 1891, 1898-9 (Giffin, Ortore). This also contributed to variations between the procedure introduced and the packages of stickers introduced. Id.

R-A9: The sole evidence of record is that of PG&E witnesses as to the manner in which PG&E electrical maintenance procedure MP E-57.8A (MFP Exhibit T-2) has been implemented effectively over time. See PG&E Findings M43-46. The witnesses also testified from a programmatic perspective that the temperature monitoring program is confirmatory in nature, and that any isolated imperfections in the data collection process are not significant, given the initial conservatisms in qualification of the equipment and the design of the plant itself. See PG&E Findings M45-M46. MFP's reliance on random data gleaned from copies of telatemp stickers must be discounted. See NRC Staff Findings I-56; I-65. MFP has proven nothing with that data. Asking questions after the record is closed does not substitute for presenting a case. Based on the record in its entirety, the Board can conclude that PG&E proactively established a program to address localized temperature effects on qualified equipment, and that PG&E is implementing that program. There is in this issue no "fundamental flaw" in the maintenance program.

Check Valves

R-A10: MFP claims that PG&E has identified a "multitude" of deficiencies in the check valve in-service testing ("IST") program (MFP Finding 98), and that Diablo Canyon "operated for years without adequate assurance that these valves were operable and could be relied on for their safety functions" (MFP Finding 106). These proposed findings, however, are either overstated or directly contradicted by record evidence.

R-A11: Each of the specific check valve testing issues identified by PG&E and cited by MFP (there are only 6, not a "multitude") has been addressed in PG&E Findings M-A1 - M-A7. The claim that Diablo Canyon has operated "for years without adequate assurance that these valves were operable" is flatly at odds with the safety analyses contained in the very documents MFP cites in support of its claim. See generally MFP Exhibits 6-11, 13. In most cases, the check valves in question had been subject to other periodic inspections which established their operability; in all cases, when an IST inspection deficiency was identified, the check valve in question was subsequently tested satisfactorily. Tr. 608 (Crockett). Even if the identified check valves were conservatively assumed inoperable, PG&E's safety analyses included in the documents of record demonstrate that inoperability would have had no effect on the ability to safely shut down the plant or mitigate the consequences of an accident.

R-A12: For example, valves SI-8900A-D, SI-8905A-D, and SI-8919A-D were determined to have been adequately tested to meet post-accident flow rates, and therefore, the IST program requirements were met and the event was not reportable. This is directly contrary to MFP's proposed Finding 102. See MFP Exhibit 10 at 1 ("...[D]uring a review of STP V-18 it was discovered that valves SI-8900A through D, SI-8905A through D, and SI-8919A through D were not individually measured for full flow, contrary to the recommendations of GL 89-04. However, through the performance of STP V-15/V-4A the subject valves were verified to stroke open to pass the post-accident flow rates, and therefore the InService Testing (IST) requirements were met and this event was not reportable.")

R-A13: MFP's proposed Finding 103 characterizes MFP Exhibit 9 as supporting a finding that "...during 1R5, when testing of SI-8981 was required under the new program, it was not clear during review of results that SI-8981 was fully stroked" -- a finding that is directly contradicted by the very next sentence in MFP Exhibit 9. The exhibit expressly states: "Further investigations and calculations determined that the commitment to the NRC was met and a full stroke was performed during 1R5." MFP Exhibit 9 at 7.

R-A14: Likewise, another valve cited by MFP in proposed Finding 104, CVCS-8440, had been inspected satisfactorily during

the Unit 1 fourth refueling outage (1R4) in 1991, and review of the maintenance history of CVCS-8440 and 15 similar valves revealed no significant maintenance problems. In addition, even assuming backleakage past the valve, the small amount of backleakage involved would have had no adverse effect on the public health and safety. See MFP Exhibit 13 at 6-8.

R-A15: The same type of safety analysis determined that the seven check valves cited in MFP Proposed Finding 100 had been capable of performing their intended safety function, and even if they had not, any small amount of leakage past the valves would have been insignificant, isolated, and within the assumptions of dose calculations. See MFP Exhibit 11 at 7-10.

R-A16: MFP's mischaracterizations of the record extend to its proposed Finding 105, relating to four Safety Injection pump discharge valves discussed in MFP Exhibit 7. Prominently omitted from the proposed finding is any reference to the safety analysis in MFP Exhibit 7, at 11-13, which finds that Technical Specification-required periodic surveillances of Emergency Core Cooling System injection flow for single pump operation, coupled with the good corrective maintenance histories for the valves in question, ensured that the valves were operable and capable of performing their intended safety function during the entire period.

R-A17: In summary, the check valves in question tested satisfactorily and were promptly added to the IST program plan. MFP has repeatedly omitted key facts in the record regarding PG&E's IST program, facts that directly contradict its proposed findings.

Underground Cable Failures

R-A18: MFP's proposed findings on underground cable faults are again filled with errors and mischaracterizations. The record is accurately reflected in PG&E's Findings M-A8 - M-A18. See also Reply Findings R32, R46, R64.

R-A19: One example of MFP's cavalier approach to the record is contained in proposed Findings 115 and 118. MFP opines that "PG&E has not identified the root cause of the three 4kV cable failures and cannot justifiably claim that they are random occurrences. . . . In failing to find the root cause of the 4kV cable failure, PG&E has been unable to rule out the possibility that they are susceptible to common cause or common mode failure, in which two redundant trains of 4kV cable might fail at the same time. This would violate the Single Failure Criterion and sharply raise the safety risk to the public." This opinion, however, is unsupported by any testimony and is directly contradicted by the record.

R-A20: Although PG&E had not completed its root cause analysis of the 4kV cable failures at the time of the hearing, the analysis had ruled out many hypothesized root causes, including the type of chemical degradation experienced by the 12kV cables. PG&E Findings M-A12; MFP Exhibit 15 at 8-10. In addition, the record evidence supports PG&E's conclusion that the 4kV cable failures indicate no risk of a common mode failure, because: (1) the failures were remote in time and location, and only one of the 4kV cable failures was an in-service failure; (2) examinations of the failed cables and additional non-failed cables showed no evidence that additional failures were imminent; (3) the failed sections of the cables have been replaced, as have other sections of non-failed cable; and (4) the 4kV safety-related cables have not been subject to the same chemical degradation and water intrusion as the non-safety-related 12kV cables. See PG&E Findings M-A12, M-A14; MFP Exhibit 15 at 9, 11; PG&E Direct Testimony at 109-110 (Ortore); Tr. 665-668 (Ortore, Giffin, Vosburg). Moreover, the cables are subject to high potential testing, there are ground fault alarms, and there are redundant trains of equipment. PG&E Findings M-A11, M-A13. MFP introduced no evidence, expert or otherwise, which contradicts PG&E's analysis of the cable failures. In light of the extensive evidence in the record and the lack of any evidence to the contrary, MFP's proposed Findings 115 and 118 must be disregarded.

R-A21: In its proposed Finding 119, MFP argues that "[a]lthough PG&E has replaced portions of the 4kV and 12kV cables, they were replaced with the same construction material. This was an inadequate corrective response because there is some question as to the acceptability of this material for the conditions under which it is operating." This opinion is also unsupported in the record. MFP has in fact selectively quoted -- to very misleading effect -- from reports by two PG&E consultants.

R-A22: MFP quotes (MFP Finding 121) a portion of a report by Okonite, the cable manufacturer, which suggested that "it would be prudent" if PG&E replaced its 1972 vintage 4kV cables with new, current vintage cables. However, the quote selected by MFP conveniently leaves out the sentences immediately before and after the quote. The sentences before the quote include Okonite's conclusion that:

> In summary, all of the data collected show that the cable sections examined are in excellent condition. The neoprene jacket has aged as one would expect after 18 years. Electrically and physically the insulation is in 'as new' condition. We conclude that the failure was an isolated incident possibly caused by installation damage.

MFP Exhibit 16 at 6. The sentences after MFP's quote include the following qualifier on Okonite's "prudent" recommendation:

> This could be done on a regular maintenance schedule. It is by no means implied that an emergency situation exists.

Id. In addition, the PG&E witness testified that PG&E replaced the failed 4kV cable with cable of more recent vintage. Tr. 661 (Ortore).

R-A23: The second report selectively quoted by MFP to support its theory in proposed Finding 119 is a preliminary analysis of the 12kV and 4kV cable failures by Altran Materials Engineering. Conspicuously omitted from the quote cited by MFP is the portion of Altran's analysis that concluded that the 4kV cable samples showed no signs of chemical attack or degradation similar to that experienced by the 12kV cables, and showed no signs of any mechanical damage whatsoever. In fact, Altran found that the 4kV cable jackets exhibited significantly higher tensile strength than even undamaged 12kV cable specimens from the warehouse, thus indicating the 4kV cables are more resistant to chemical degradation. See MFP Exhibit 21 at 1-2. The PG&E witnesses testified that PG&E is considering the Altran cable replacement recommendation as part of its final decision on corrective actions after completing its root cause analysis. See Tr. 663 (Ortore). Thus, contrary to MFP's proposed findings, PG&E's decision to replace the 4kV cables with the same replacement material (of more recent vintage) was supported by the analysis of the two consultants. PG&E's decision also was supported by its own expert

opinion -- unrebutted in the record -- that there was no reason to believe that there was any design deficiency in the 4kV cable that was installed in 1972, even though some cable products of current vintage may be of higher quality. See Tr. 651 (Ortore).

R-A24: In proposed Finding 128, MFP finds fault because "PG&E has not improved its monitoring system." See also MFP Finding 130, citing Tr. 657. However, the record (indeed cited by MFP) makes clear that two grounds of unknown cause, separated by several years, do not suggest an imminent problem. Nonetheless, as part of its continuing evaluation, the witnesses stated that monitoring techniques were being examined. Tr. 657 (Giffin, Ortore). This again illustrates the comprehensive and thorough nature of PG&E's root cause analysis for the cable failures. See also MFP Exhibit 18 at 3 (listing the ten separate root cause studies and investigations undertaken by PG&E and its contractors regarding the cable failures).

R-A25: In proposed Findings 131 and 134, MFP argues: "...[S]ubmergence of the 4kV . . . cables for extended periods of time . . . may have contributed to the 4kV cable failures. . . . PG&E has yet to establish the root cause for the 4kV cables." This is another attempt to lump the 12kV non-safety related cable failures with the 4kV cable failures. This again, however, is a proposed finding directly contradicted by the only evidence of record. The evidence in the record indicates that the 4kV cables

were not subject to degradation due to submergence in water, chemical attack, or both. See MFP Exhibit 15 at 8-9; MFP Exhibit 16 at 2; MFP Exhibit 18 at 13-15; MFP Exhibit 21 at 1; Tr. 662 (Giffin). The record indicates that submergence, and actions or omissions that could have caused submergence, did not contribute to the 4kV cable failures. See MFP Exhibits 15 at 8-9, 16 at 2, 18 at 13-15, 21 at 1; Tr. 662 (Giffin).

R-A26: At bottom, MFP assigns overstated significance to two safety-related 4kV cable failures and three non-safety-related cable failures. MFP argues (in proposed Finding 142): "We are particularly concerned about the vulnerability of 4kV cable located in a harsh environment. We find that, under the circumstances, there is an unacceptable risk that the added stress of accident conditions could lead to failure of one or both trains of 4kV cable which supplies an essential safety system." The evidence, however, does not justify this "concern." The failed 4kV cables were promptly replaced with new cable, the sumps and sump pumps have been repaired and formally included in PG&E's preventive maintenance program, and no other 4kV cables in the plant are subject to potential submergence. See PG&E Findings M-A12, M-A14, M-A18; Tr. 663 (Ortore). In addition, the cables in question are not subject to environmental qualification and are not subject to the "added stress of accident conditions."[1] Finally, as discussed

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[1] The lack of connection of these cables to environmental qualification was thoroughly established in connection with (continued...)

above, the record contains uncontroverted evidence that the 4kV cables are not vulnerable to a common mode failure. The evidence does not support a finding that there is some fundamental program flaw in this area or that a significant issue is being left uncorrected.

Motor Installed on MOV Actuator

R-A27: This issue has been adequately addressed in PG&E Findings M-A19 - M-A22, and in Reply Finding R21.

R-A28: It should be emphasized, however, that MFP liberally sprinkles its proposed findings on this incident with "testimony" and opinions that have no analogue in the record. For example, MFP Finding 150 gratuitously comments on MFP Exhibit 24 and suggests, without citation, that "[t]he closing of the valve in such a short period would be a marginal, if not unlikely, proposition". Similarly, MFP's speculation in Finding 151 that the "margin of error" in PG&E's safety analysis is too small is unsupported. These unsupported statements and opinions must be rejected.

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[3] (...continued)
MFP's third late-filed proposed contention. See, e.g., "Pacific Gas & Electric Company's Response to San Luis Obispo Mothers for Peace Third Late-Filed Contention," dated April 27, 1993; see also LBP-93-9, 37 NRC at 448-49.

R-A29: We also note MFP's attempt to introduce extra-record information on NRC Generic Letter ("GL") 89-10, Supplement 5. MFP had an opportunity to introduce this document at the hearings and/or to cross-examine based on its information. MFP did neither. There is no reason to take official notice of the document now. Even if there were, there is no evidence that NRC inspections of PG&E's GL 89-10 implementation have found any significant programmatic deficiencies.

R-A30: The only evidence of record on this issue is the PG&E NCR, MFP Exhibit 24, which concluded that the personnel error was isolated and not a programmatic deficiency. See MFP Exhibit 24 at 9-10. MFP specifically concedes that the NCR concludes that the valve would have been able to fully close and perform its intended safety function even with the wrong size motor. In addition, as MFP also concedes, there are manual valves in line that can be closed if the MOV failed to close. See MFP Exhibit 24 at 4-5. And, the error itself was self-identified and evaluated by PG&E less than a month after installation of the wrong size motor. See MFP Exhibit 24 at 3.

Storage and Handling of Lubricants

R-A31: MFP claims in its proposed Finding 162 that there have been recurring problems over seven years relating to control

of lubricants. These "problems" are addressed in PG&E Findings M-A25 - M-A29. See also Reply Finding R42.

R-A32: The record on this issue shows several minor lubrication control issues widely separated in time (1987, 1991, 1993) and dissimilar in nature (unlabeled containers, mislabeling of grease guns, and wrong oil added to equipment). See MFP Exhibit 27 at 1, 10; MFP Exhibit 28 at 2-3. While the control of lubricants is an issue that may need constant management vigilance to assure personnel performance, corrective actions have been adequate and existing procedures are sufficient. See PG&E Finding M-A29.

R-A33: MFP engages in extra-record speculation as to the "potential" for safety significance of these issues in the future. MFP Finding 165. However, contrary to this speculation, the evidence indicates that the referenced incidents involved small amounts of oil or lubricants, with no impact on equipment operability. PG&E Findings M-A27, M-A28. In addition, existing preventive maintenance tasks assure that oil is periodically changed and sampled, and equipment monitored for excessive wear. PG&E Finding M-A29. These measures minimize any "potential" safety impacts.

R-A34: PG&E in June 1993 self-identified the latest incident (use of wrong type of oil) and initiated appropriate

management review of the lubricants program in general in order to identify further improvements. Tr. 734 (Giffin); PG&E Finding M-A27. That PG&E's corrective actions were not complete at the time of the hearing in August 1993 has no bearing on the adequacy of the overall program, especially where, as here, the issue arose only weeks before the hearing. What is important is that PG&E self-identified the issue, evaluated the found condition as having no adverse impact on the safe operation of the plant or the equipment to which the oil had been added, and promptly initiated root cause analysis and corrective actions under its problem resolution program.

Fuel Handling Building

R-A35: The pertinent facts regarding this issue are addressed in PG&E Findings M-A40 - M-A44. MFP's principal argument (in proposed Finding 180), that there is insufficient surveillance of the Fuel Handling Building ("FHB") to detect "aging effects," is also addressed in Reply Findings R45-R46, and R86.

R-A36: The record shows that PG&E has tested and monitored the FHB sealing capability since prior to commencement of operation. This has been done through a surveillance test, performed every 18 months in accordance with Technical Specifications. See MFP Exhibit 39 at 2. It was precisely this surveillance test which, in 1989, detected the low negative

pressure attributable to FHB sealing problems. As a result, PG&E improved the sealing capability and re-sided the building. Id. at 17-19 Moreover, when PG&E first detected the problem, it increased the surveillance test frequency to assure the operability of the FHB ventilation system, and then initiated a corrective action to install permanent differential pressure instrumentation to allow for more frequent monitoring. Id. at 9, 18.

R-A37: MFP's quarrel with these corrective actions seems to be that MFP does not believe PG&E's instrumentation is accurate enough to detect sealing problems, and that a surveillance test designed to detect sealing problems is no substitute for adding the entire building to the preventive maintenance program. See MFP Findings 170, 172, 177 and 180. However, MFP offered no evidence, expert or otherwise, to support this position or to rebut PG&E's uncontradicted testimony regarding the adequacy of the current surveillances, corrective actions, and preventive maintenance programs. See, e.g., Tr. 807-8 (Giffin). There is no basis on which to conclude contrary to the judgments contained in the record.

Tests of Containment Personnel Airlock

R-A38: MFP claims (in proposed Finding 199) that "the repeated occurrence, on three occasions," of missed post-maintenance surveillances for a containment personnel air lock

indicates a significant deficiency in the Diablo Canyon maintenance and surveillance program. Based on these three occurrences, MFP also leaps to an overall conclusion (proposed Finding 190) that PG&E's method of counting missed surveillances is misleading and undermines the overall credibility of the surveillance program at Diablo Canyon.

R-A39: As for the missed containment air lock surveillances, MFP offered no evidence, expert or otherwise, to rebut PG&E's testimony and documentation that the three occurrences were isolated and did not indicate a pervasive problem with the surveillance program. See PG&E Findings M-A45, M-A46, M-A49. PG&E Reply Findings R62-R66 also address PG&E's overall effectiveness in implementing surveillance tests.

R-A40: As for PG&E's method of counting missed surveillances, it is entirely consistent with NRC regulatory practices and PG&E's own problem resolution system. PG&E Finding M-A50; NRC Staff Finding I-106 - I-107. The methodology does not undermine the credibility of PG&E's overall surveillance program; even with missed surveillances counted as MFP wishes, the record evidence amply demonstrates that the absolute percentage of missed surveillances at Diablo Canyon is historically low, when compared with the 10,000 surveillances performed every year (many of which actually involve multiple separate surveillances which, if missed, would be a "missed surveillance"). PG&E Finding M50.

Component Cooling Water ("CCW") Heat Exchanger

R-A41: MFP (in proposed Findings 203 and 206) asserts that PG&E is not performing eddy current testing of CCW heat exchanger tubes with sufficient frequency, and that limits on the numbers of tubes that can be plugged means that maintenance and surveillance activities cannot assure the efficiency of the CCW heat exchangers during periods between eddy current tests. Moreover, MFP proposed Finding 213 claims that PG&E is exceeding or planning to exceed the maximum flow rates for the CCW system, thus causing further degradation. These findings, MFP asserts, support general findings regarding PG&E's programmatic failure to detect "aging effects" and a "pattern" of inadequate monitoring of essential safety equipment.

R-A42: PG&E has addressed MFP's general findings regarding detection of "aging effects" in Reply Findings R17, and R45-R47. PG&E has addressed MFP's general findings regarding surveillances in Reply Findings R62-R66.

R-A43: PG&E has addressed the specific issue of CCW heat exchanger surveillance in PG&E Finding M-A54. PG&E concludes that the evidence demonstrates this to be a case of successful detection and correction of an issue. Specifically, and contrary to MFP, the record is clear that after identifying the issue of "fretting" of CCW heat exchanger tubes, PG&E increased the scope of its eddy

current tests from 30 percent of the tubes to 100 percent of the tubes, and is actively considering mid-cycle eddy current testing. See MFP Exhibit 47 at 1. In addition, the record is also clear that PG&E incorporated the design basis maximum flow limits of the heat exchangers into its operating procedures. Id. Therefore, MFP's speculations that the frequency of eddy current tests is insufficient, and that PG&E "plans to continue to exceed the maximum flow rates for CCW," are not only unsupported by any expert testimony, they are also directly contradicted by evidence in the record.

Auxiliary Building Ventilation System ("ABVS")

R-A44: In this category MFP identified one incident in which human error, during a preventive maintenance task, rendered the ABVS temporarily inoperable. See PG&E Findings M-A57 - M-A59. MFP claims (proposed Finding 220) that two personnel errors were involved; that the two errors indicate a programmatic deficiency in PG&E's work instructions and communications; and that the deficiency created an unacceptable safety risk. According to MFP, this event supports its general findings regarding failures of multiple "barriers" and regarding "inadequate" communication and procedures that cause the disabling of safety systems. MFP Findings 27, 41, 46, 55.

R-A45: PG&E has addressed MFP's general findings regarding "multiple barriers" (Reply Findings R48-R52), alleged "inadequate communications" (Reply Findings R55-R58), and alleged "inadequate procedures" (Reply Findings R69-R74). All are completely baseless.

R-A46: MFP's proposed findings on this particular issue take a characteristically huge leap in logic in asserting that an isolated event caused by a personnel error leads to the overall conclusion that PG&E's maintenance program "may create dangerous conditions in DCNPP when complex maintenance tasks are performed during plant operation." MFP Finding 221. MFP also asserts that PG&E's corrective actions in this case are "vague." MFP Finding 222. The MFP exhibits show, however, that: (1) the incident had no safety significance; and (2) PG&E has initiated comprehensive, precise corrective actions for the event, including revising its recurring task work order to specifically identify the dampers to be closed and the clearance required. See PG&E Findings M-A57 - M-A59; MFP Exhibit 49 at 7-8, 11-14. Clearly, in light of this record evidence, it is MFP's speculations which are "vague" and unsupported.

Electrical Panel Covers

R-A47: MFP, in proposed Findings 227 and 230, would draw sweeping programmatic conclusions from two separate, minor

incidents in 1993 that have been addressed. See PG&E Findings M-A60 - M-A63.

R-A48: First, the Board cannot programmatically conclude from this issue that PG&E routinely implements ineffective corrective actions. See Reply Findings R12, R28-R44 (addressing and discrediting MFP's proposed general findings regarding PG&E's corrective actions). In this specific case, corrective actions for a single previous event in 1989 involving loose or missing fasteners in electrical equipment could not have prevented the two events in 1993 involving reinstallation of fasteners on electrical panels following maintenance, as noted in the NCR. MFP Exhibit 52 at 9. (The 1989 corrective actions involved programmatic guidance for resolving fastener problems after they occur, not guidance for preventing the problems before they occur. See MFP Exhibit 52 at 9.) While one can second-guess whether further corrective actions were appropriate in 1989, one must retain perspective. This was not a major issue in 1989, either in terms of the scope of the "problem" or its safety significance. PG&E implemented corrective actions at that time. The NCR process in 1993 should be applauded for its openness and thoroughness in evaluating those 1989 actions.

R-A49: The corrective actions for the first discovered 1993 event would not have prevented the second discovered 1993 event. The first 1993 event (fasteners not installed on Unit 1 RHF panel) was discovered in April 1993, whereas the second discovered

1993 event (covers not installed on Unit 1 and 2 hot shutdown panels) actually relates to work done in refueling outages prior to April 1993. See MFP Exhibit 51 at 7-8; MFP Exhibit 52 at 1.

R-A50: Contrary to MFP, one cannot reasonably infer from this issue that PG&E "shows a misunderstanding or disregard for the safety principles underlying its maintenance responsibilities" (MFP Finding 231). MFP on this issue (in proposed Findings 231-235) is engaging in extra-record "testimony" regarding the safety significance of these issues. Reply Findings R22-R27 also address the specious nature of this entire issue.

R-A51: In proposed Finding 234, MFP quibbles specifically with the safety assessment inherent in the document of record, finding it "glib and unsupported." However, MFP has no record on which to base this opinion, nor does MFP ever explain the basis for it. MFP Exhibit 52 -- the only record evidence -- specifically concludes that the vital 4kV bus and its associated diesel generator were capable of performing the intended functions before and after a seismic event. PG&E Finding M-A62. MFP's non-expert opinion is immaterial. See also NRC Staff Finding I-119 (explaining MFP's burden of developing a case at the hearing rather than in proposed findings).

R-A52: Finally, the fact that the root cause evaluations for incidents documented in April and June 1993 were still ongoing

in August 1992 is neither surprising nor unreasonable. See PG&E Finding M-A63.

Containment Equipment Hatch Gap

R-A53: By any reasonable measure, this issue already is adequately addressed in PG&E Findings M-A64 - M-A66.

R-A54: MFP (in proposed Findings 238 and 243) specifically cites this issue for the proposition that PG&E fails to take effective corrective actions. In this case, MFP's argues that, despite a prior similar incident ten years earlier, and an NRC Information Notice issued fourteen years earlier, PG&E failed to prevent a personnel error in 1993. However, as discussed in Reply Findings R41 and R71, above, the record shows that the 1993 incident was the result of an isolated personnel error -- the worker failed to follow a verification procedure. PG&E Finding M-A65; MFP Exhibit 53 at 6, 11, 15-18. The uncontroverted evidence is that the procedural guidance, as well as the training and experience of the worker, were all appropriate. See PG&E Finding M-A66. MFP simply ignores the record. There is no evidence that something else should have or could have been implemented years ago to avoid the 1993 error. There is no basis to conclude that this incident somehow reflects a systemic problem.

Manual Reactor Trip Caused by Fuse Failure

R-A55: This issue involves a personnel error by a contract electrician in replacing fuses in 1989. The contract electrician was to replace old-style fuses, which had been identified as unreliable in 1987, with newer fuses. However, he replaced fuses in the wrong cabinet by mistake. As a result, in 1991, one of the "old style" fuses failed, requiring a manual reactor trip. See PG&E Findings M-A-67, M-A68. According to MFP, this is an example of a breakdown in PG&E's maintenance program, because "[i]t is reasonable to expect that the maintenance and surveillance personnel should have been able to conduct a simple act of fuse replacement without mishap." MFP Finding 249. This extra-record opinion, however, in effect denies the possibility of personnel errors and would elevate every such error to programmatic significance. As discussed in Reply Findings R50, and R67-R68, there is no evidence of pervasive personnel performance problems at Diablo Canyon.

R-A56: MFP also cites this event as an example of "previous corrective action failed to prevent recurrence." However, there is also no record support for this proposition. This is because the two events are in fact different events, not similar events. The first event -- reliability problems with "old style" fuses -- was attributable to an equipment problem; the corrective actions were to replace the fuses with new, more

reliable ones. The second event -- the failure of one of the "old style" fuses, causing a manual reactor trip -- had as its root cause a personnel error by an electrician in failing to replace the "old style" fuses in 1989. The unreliability of the fuse itself was not the root cause. See MFP Exhibit 56, at 4-5. This is not an example of a failure to identify appropriate corrective actions in 1989. It, therefore, does not bear at all on programmatic capabilities with respect to identifying corrective actions.

Limitorque 2-FCV-37 Failure to Close

R-A57: This issue has been adequately addressed in PG&E Findings M-A69 - M-A71. In addition, PG&E's Reply Findings above respond to the three areas of generic significance MFP would assign to the issue. See Reply Findings R17, R45-R47 (detecting "aging effects"); R59-R61 (creating "undetectable" failures by maintenance); R69-R74 ("inadequate" work instructions).

R-A58: MFP's proposed Findings 260, 263 and 265 also mischaracterize the record. For example, MFP cites the March 23, 1993 minutes from PG&E's Technical Review Group ("TRG") meeting in support of its finding that 2-FCV-37 was inoperable between 1990 and 1993; however, MFP neglects to cite later minutes from the TRG, reported in the same NCR, which concluded that the valve had in fact been capable of performing its intended safety function. See MFP Exhibit 57 at 24-25, compared to Exhibit 57 at 23. Moreover,

MFP's assertion that PG&E's response to the problem was inadequate once it was identified is contradicted by MFP's own findings themselves, which confirm that PG&E maintenance personnel actively and comprehensively investigated the problem between the time it was discovered (January 31, 1993) and the time the source of the problem was determined (March 12, 1993). See MFP Findings 251-254.

Emergency Core Cooling System Accumulator Tanks

R-A59: This issue has been adequately addressed in PG&E Findings M-A72 - M-A75, and Reply Findings R33, R37, R47, and R84. It bears emphasizing, however, that at no time have IGSCC indications or small leaks rendered any of the accumulators at issue inoperable. See MFP Exhibit 60 at 7. PG&E and the NRC Staff witnesses both testified that PG&E's investigations and corrective actions for this matter have been appropriate and, in the words of the NRC Staff witness, "very good work." PG&E Finding M-A75. In contrast, MFP can cite no evidence or expert opinion in the record to support its extra-record and unsubstantiated conclusion that "[T]he weight of the evidence demonstrates that this ad hoc approach to IGSCC is insufficient" (MFP Finding 171).

Corrosion of Underground Piping

R-A60: This issue has been adequately addressed in PG&E Findings M-A76 - M-A81, Reply Findings R28-R39 (addressing

specifically MFP's assertion that this incident indicates untimely and ineffective corrective actions), and Reply Findings R45-R46 (addressing "aging" effects). See also Reply Finding R74.

R-A61: It is worth noting that MFP would disregard PG&E's operability determinations with respect to this equipment, claiming that this is merely "an indication that PG&E was lucky this time." MFP Finding 304. PG&E, however, has never relied upon operability and safety significance determinations to establish the effectiveness of the Diablo Canyon maintenance and surveillance programs. There is ample other evidence establishing that effectiveness, evidence that goes directly to the material findings the Board must make. See PG&E Findings M3-M82. Operability and safety significance determinations merely highlight the minor nature of the issues MFP would puff into major issues. Moreover, as observed by Mr. Dillard, the success PG&E has experienced in operating and maintaining Diablo Canyon has been the result of dedication, hard work, and competence -- not luck. See PG&E Direct Testimony at 154-156, 158-9 (Dillard).

Control of Measuring and Test Equipment

R-A62: This issue has been adequately addressed in PG&E Findings M-A82 - M-A85. In addition, Reply Finding R40 specifically responds to MFP's claim that this issue is part of a "pattern" of untimely or ineffective corrective actions. PG&E

received a violation in this area and took corrective actions. This does not mean that PG&E's quality assurance program will stop looking for minor documentation problems in the area. The fact that PG&E recently found a minor problem (PG&E Finding M-A85) shows the system is working well.

Degraded Coupling on Centrifugal Charging Pump ("CCP")

R-A63: As discussed in PG&E Finding M-A88, this 1993 incident evidences the effectiveness of PG&E's predictive maintenance program. As a result of this program, PG&E found a degraded equipment condition and corrected it. PG&E Finding M-A89.

R-A64: MFP would nonetheless find fault. In its proposed Findings 350 and 353, MFP argues that corrective actions for a degraded coupling experienced in a CCP motor in 1989 failed to preclude the excessive coupling wear discovered on the same CCP motor in 1993 by predictive maintenance monitoring. But MFP ignores two key facts in the record. First, PG&E's maintenance program indeed detected the problem in 1993 before it affected operability of the component. MFP Exhibit 73 at 2. Second, the 1993 event cited by MFP is not only evidence of the strength of PG&E's predictive maintenance program, it is also evidence of the open and self-critical nature of PG&E's problem resolution process. The very weakness which MFP cites in its finding, i.e., PG&E's conclusion that its corrective actions for the 1989 event did not

preclude equipment wear in 1993, is in fact a demonstrated strength of PG&E's overall maintenance program. See PG&E Finding M-A89; M80 (citing Tr. 2270-2 (Miller, Narbut)).

Inoperable High Pressure Turbine Stop Valve

R-A65: MFP Exhibit 74 is an LER documenting a unit shutdown -- in accordance with Technical Specifications -- due to an inoperable high pressure turbine stop valve. This was an isolated case of equipment failure, with absolutely no evidence that the failure was attributable to a maintenance deficiency. PG&E Findings M-A90 - M-A91.

R-A66: MFP asserts (Finding 357) that improper maintenance by PG&E "may have" caused this "undetectable failure." PG&E has responded to this speculative finding in Reply Finding R61, above. There is no evidence that maintenance caused this failure. See PG&E Finding M-A90. In light of the record evidence, MFP's speculations regarding "improper maintenance" and "undetectable failures" are unsupportable.

Diesel Generator Failure to Achieve Rated Voltage

R-A67: In this category MFP identified one incident in which an inappropriate equipment condition was created by a personnel error during maintenance. The condition was detected

during a post-maintenance surveillance test. The incident has no generic significance, other than that it shows a properly functioning post-modification test program. PG&E Findings M-A92 - M-A94; Reply Finding R60.

R-A68: In proposed Finding 368, MFP asserts that it was "more a matter of luck than 'good maintenance'" which caused PG&E to discover the condition during the post-modification test. This represents no more than extra-record speculation and opinion. The fact is that the surveillance worked as intended.

R-A69: In proposed Finding 365, MFP claims that this event demonstrates a programmatic deficiency in PG&E's maintenance coordination and training. However, the record indicates that the root cause and contributory cause of the event were <u>not</u> lack of training or inadequate communication, but an inadequate procedure and the fact that the maintenance work involved was an unusual, one-time evolution performed at the request of the Engineering staff. <u>See</u> MFP Exhibit 75 at 5. PG&E has responded to the root cause and contributing factors identified in the NCR. PG&E Finding M-A94. MFP cannot, without evidence, change the root cause to make it fit a global theory. <u>See also</u> Reply Findings R48-R52, R55-R58 (regarding MFP's "multiple barriers" and "inadequate coordination" theories).

Missed Surveillance Tests

R-A70: This issue, involving two unrelated issues of missed surveillance tests (and exactly three missed tests and one improperly performed test), has been adequately addressed in PG&E Findings M-A95 - M-A99 and Reply Finding R52. See also Reply Findings R62-R66 (regarding the successful implementation of the surveillance test program at Diablo Canyon). MFP is simply overstating the weight that can be assigned to this evidence in a programmatic assessment of PG&E's surveillance program.

Auxiliary Feedwater ("AFW") Pump Test Procedure

R-A71: In its proposed Findings 387 and 389, MFP suggests that a typographical error in a surveillance test procedure indicates a fundamental weakness in PG&E's surveillance program. The record demonstrates that this one typographical error was minor, did not affect the successful performance of the surveillance test in question, and was corrected promptly when found. See PG&E Findings M-A100, M-A101. This issue has little evidentiary value in a programmatic assessment.

R-A72: The NRC Notice of Violation cited by MFP in support of its proposed findings did not concern the minor procedural deficiency in question, or PG&E's timeliness in addressing the deficiency. The violation related to the failure of

the system engineer who discovered the procedural deficiency to issue an "Action Request" to track the correction of the procedural deficiency and to ensure that tests conducted while the error existed had in fact been done properly. See PG&E Finding M-A102.

Hold Down Motor Bolts on Centrifugal Charging Pumps

R-A73: MFP asserts (in proposed Findings 393, 399, and 400) that PG&E was untimely in identifying in 1992 certain manufacturing deficiencies in hold down bolts on centrifugal charging pumps ("CCPs"). These deficiencies had existed since original procurement of the items in the 1970's. Therefore, according to MFP, this event supports general findings regarding a "pattern" of untimely responses to maintenance problems and an inability to detect manufacturing or procurement deficiencies. MFP Findings 34, 58. PG&E has responded to these general findings. See Reply Findings R28-R34, R45-R47 and R75-R80.

R-A74: MFP's characterization of this event misses an important point: this event is an example of a successful rather than inadequate maintenance program, because PG&E's proactive preventive maintenance program did discover the equipment problem and did so before the problem would have had any effect on operability of the system. This is exactly how a maintenance program should work. See PG&E Finding M-A103.

R-A75: The manufacturing and procurement of the component in the 1970's is irrelevant to an assessment of PG&E's current preventive maintenance program, which found and fixed the problem. (In addition, the procurement issue is outside the scope of this proceeding. See PG&E Finding M-A104; see also NRC Staff Finding I-175 (regarding the lack of relevancy of procurement issues).) That PG&E's maintenance program could have found and fixed the problem in 1986 in response to a Westinghouse technical bulletin is a debatable issue which was raised first, not by MFP, but by PG&E itself in its thorough root cause analysis of the event. MFP offered no additional evidence, expert or otherwise, to support its conclusion that PG&E should have found the problem in 1986; the only record evidence is PG&E's own analysis, which ultimately identified original procurement and vendor deficiencies as the root cause. See MFP Exhibit 83 at 4.

R-A76: MFP Proposed Finding 401 references several other PG&E NCRs listed in MFP Exhibit 83, and concludes from this listing alone, without further evidence, that PG&E has a programmatic problem with discovery of material discrepancies and procurement defects in general. However, these other reports were not offered into evidence, and the record is devoid of support for a finding that they somehow indicate a programmatic problem in PG&E's procurement program. See PG&E Finding M-A105. This is simply a vivid example of MFP's myopic approach to the NCRs it introduced into evidence. See Reply Finding R41.

Reactor Coolant System ("RCS") Leakage

R-A77: In addressing this issue, MFP focuses on excess RCS leakage identified by PG&E in 1991. PG&E Finding M-A106. In proposed Findings 409, 414, 417 and 419, MFP asserts that PG&E's preventive maintenance program should have identified at an earlier time certain valve bolting corrosion which led to the leakage. These proposed findings also claim that PG&E's corrective actions for the corrosion (replacing the carbon steel bolts with stainless steel not subject to boric acid corrosion) are unacceptable, because PG&E is implementing them as "prudent actions" rather than as NRC commitments. (MFP draws no significance from a math error involved in this issue. See PG&E Finding M-A107. Accordingly, this issue can be ignored.)

R-A78: MFP cites two NRC communications and two INPO documents issued between 1984 and 1988 in support of its claims that PG&E should have identified the corrosion earlier. However, the NRC and INPO documents were not introduced into evidence and MFP conducted no cross-examination of PG&E witnesses on the subject. See Tr. 1180-87. The only mention of these documents is in PG&E's NCR (MFP Exhibit 84 at 20-21), which only listed the documents and does not discuss or characterize them as being the root cause or a contributory cause of the event. In the absence of any evidence to the contrary, MFP's speculative attempt to link

these documents by title alone to the incident at issue is unsupported and not persuasive.

R-A79: MFP's attempt to distinguish between the effects of "prudent" corrective actions and corrective actions which are licensing commitments is immaterial. MFP cites no evidence that would indicate that PG&E's corrective actions are either incomplete or unlikely to be implemented. The evidence supports the opposite conclusion: PG&E's corrective actions are on track and will result in every susceptible valve bolt being replaced with stainless steel and added to PG&E's preventive maintenance program. See MFP Exhibit 84 at 1, 18-20.

Inoperable Reactor Cavity Sump Wide Range Level Channel

R-A80: This issue concerns the intermittent failure of an indicator and a repeat failure by Operations to identify the equipment failure. See PG&E Findings M-A110 - M-A116.

R-A81: In proposed Finding 425, MFP attempts, without evidentiary support, to draw this incident into Contention I. MFP claims that additional training provided to operators in 1990, when operators first did not detect that a reactor cavity sump wide range level channel indicator had failed low, was ineffective. It did not preclude the event in 1991 when the same channel indicator failed low and went undetected by the operators for some time.

However, no matter how hard MFP tries, it cannot cite any evidence to contradict the record evidence that this event relates to an Operations failure, not a failure to maintain equipment. See PG&E Finding M-A111. And even if the event is interpreted to reflect in some sense on PG&E's surveillance program, the issue has been resolved to the satisfaction of PG&E and the NRC Staff, and does not reflect a current problem with PG&E's surveillance program. PG&E Findings M-A111, M-A116; Reply Finding R65.

R-A82: MFP also attempts to use the equipment problem involved in this incident as evidence of a global maintenance problem. MFP Findings 429-430. Unfortunately for MFP, these proposed findings are no more than ex..a-record musings. There is no evidence that suggests that in this case there was a failure to adequately maintain equipment. The NRC Staff certainly did not find an equipment/maintenance problem to be a significant concern. See PG&E Findings M-A111 - M-A114. Nor is there any evidence to support MFP's assertion that the "SPDS is not maintained in a sufficiently reliable condition" (MFP Finding 429).

Design Criterion Memorandum ("DCM") Requirements

R-A83: PG&E Findings M-A117 - M-A118 describe PG&E's initiative to upgrade design documentation. MFP Exhibit 90 is a PG&E NCR addressing a part of this effort, involving a review of

design documents against existing maintenance and surveillance activities. PG&E Finding M-A119.

R-A84: MFP proposes (Findings 449 and 450) that the Board not issue the 40-year license amendment to PG&E unless and until PG&E has completed the effort to enhance consistency between design documentation and the maintenance and surveillance program. MFP's proposed findings also assert that the discrepancies between design documents and PG&E's surveillance program indicate a weakness in the current overall surveillance program. MFP's findings in this regard, however, are unsupported by the record.

R-A85: The uncontroverted record indicates that PG&E's design documentation review initiative is a program enhancement, not a prerequisite to PG&E's surveillance program being adequate. See PG&E Finding M-A120; Tr. 1206 (Giffin). Neither the NRC Staff nor Mr. Dillard found this upgrade effort to reflect any fatal deficiency in the current surveillance program.

R-A86: The issue that appears to bother MFP is whether the NRC will be able to adequately oversee the program. See MFP Proposed Finding 449. However, there has been no showing that this PG&E initiative is even necessary to meet regulations. See NRC Staff Finding I-192. Furthermore, this matter is precisely the type of issue which should be left to the NRC Staff in its exercise of day-to-day inspection and enforcement authority. In the absence

of any evidence of safety-significant gaps in PG&E's current surveillance program, this issue is not an issue that in any way affects the Board's findings regarding the adequacy of that program.

Isolated Pipe Support Snubber Damage

R-A87: This issue concerns one occurrence of a damaged snubber. PG&E Finding M-A121. The damaged snubber has been repaired and other comprehensive corrective actions were taken to address various causes and contributory factors. PG&E Finding M-A123.

R-A88: MFP asserts (in proposed Findings 454 and 455) that PG&E's maintenance and surveillance program failed to prevent or detect a defect in the snubber that contributed to the damage. MFP would conclude that the isolated incident indicates that PG&E experiences an excessively high number of equipment defects which cannot be detected with ordinary surveillance measures. This, according to MFP, supports its general findings regarding "repetitive" examples of manufacturing and vendor deficiencies at DCPP. See MFP Findings 57 and 58.

R-A89: The record, however, contradicts MFP's interpretation of this event. First, as addressed in Reply Findings R78-R80, there has been no repetitive "pattern" of

manufacturing or vendor deficiencies at Diablo Canyon. The record shows only a few examples, which have generally been detected in surveillance tests and subsequently fixed.

R-A90: Second, in this specific case, PG&E found the snubber damage, the damage did not in any way affect the operability of any safety system, and corrective actions were promptly identified and implemented to replace the types of snubber involved with a new type. PG&E Findings M-A121, M-A123; MFP Exhibit 91 at 6. This isolated example of an equipment failure does not lead to an overall conclusion that Diablo Canyon experiences excessive equipment failures. In fact, the record indicates that there is a program to inspect and test snubbers, and that PG&E's response to this one snubber failure was comprehensive. See PG&E Finding M-A124.

Gas Decay Tank Missed Surveillance

R-A91: This issue has been adequately addressed in PG&E Findings M-A125 - M-A129. This was a surveillance "missed" one time by virtue of being two hours late. PG&E Findings M-A126, M-A128. Its lack of significance in an overall surveillance program assessment is well established. See Reply Findings R62-R66.

Seismic Clips

R-A92: This issue is addressed in PG&E Findings M-A132 - M-A134, and Reply Finding R58. As shown there, in October 1992, PG&E discovered that seismic clips had not been installed on certain Unit 1 breakers. PG&E investigated, determined that no inoperable condition existed, and identified corrective actions.

R-A93: MFP's proposed Finding 469 claims that corrective actions for a 1988 event in which seismic clips were not installed on reactor trip and bypass breakers should have precluded the 1992 incident (in which seismic clips were not installed on the same breakers). However, MFP blatantly mischaracterizes the record on this issue. MFP Finding 470 quotes only page 11 of PG&E's NCR on the subject (MFP Exhibit 98), while omitting the key portion of the quote which refers to another section of the document for further detail. The referenced other section of the document concludes that "the two events are actually different events with different causes." MFP Exhibit 98 at 14. Accordingly, the corrective actions for the 1988 event <u>would not</u> and <u>could not</u> have precluded the 1992 event. Previous corrective actions "dealt with the original installation and communication of design information being inadequate, whereas the current event is concerned with checking that the clips are reinstalled after routine testing." <u>Id</u>.

Containment Fan Cooler Unit ("CFCU") Backdraft Dampers

R-A94: By any reasonable measure, this issue has been adequately ventilated. See PG&E Findings M-A135 - M-A144; Reply Findings R21, R34. However, for emphasis, a few additional reply findings are warranted.

R-A95: MFP's complaints (and extra record speculations) focus again on what MFP describes as ineffective and untimely corrective actions. See MFP Findings 476, 479, 486. PG&E has noted that its timeliness in identifying these issues in early 1992 was sub-par. See PG&E Findings M-A139, M-A144. However, the record amply demonstrates that PG&E's maintenance deficiencies in this case did not affect the operability of the CFCUs, and that PG&E's most recent corrective actions have comprehensively addressed the maintenance deficiencies to the satisfaction of the NRC Staff. See PG&E Findings M-A138, M-A142, M-A143. The NRC Staff witnesses concluded that this one "black mark" did not change the Staff's overall conclusion that PG&E's maintenance program is superior. See Tr. 2214-15 (Miller, Narbut); Tr. 2220 (Miller); see also Reply Findings R12, R28-R29 (regarding MFP's general corrective actions arguments).

R-A96: MFP proceeds (e.g., Findings 494, 500, 502 and 504) to find in this episode numerous other failures that it would characterize as programmatic. However, this is simply a variation

on its recurring "multiple barriers" argument. See Reply Findings R48-R52. Sub-par performance in this case is reflected in the various NCRs, LERs, and enforcement documents introduced into evidence. These thorough and candid assessments show that the problems that occurred in this case have been identified, evaluated, and corrected. MFP's Contention I fails because, among other reasons, there are so few episodes of this type. MFP wants one experience to represent the program. The evidence does not bear this out.

Debris Issues

R-A97: This issue also has been carefully and accurately summarized and evaluated in PG&E Findings M-A145 - M-A156. See also Reply Finding R74. In contrast, in its proposed Findings 511, 521, and 534, MFP continues to mislead and misdirect, arguing that there is a longstanding, continuing, and non-specific problem with control of foreign material "and debris" at Diablo Canyon. MFP lumps every conceivable type of debris and housekeeping problem together. But MFP blithely ignores the record evidence which demonstrates that the exhibits relate to at least three separate debris control issues, each of which involves separate personnel, procedures, problems and corrective actions. See PG&E Finding M-A146; see also PG&E Finding M-A156 (concerning a fourth issue, "housekeeping"). None of these issues reflect a fundamental flaw.

In combination, they certainly do not reflect a common or pervasive failure.

R-A98: The record indicates that PG&E's corrective actions for minor problems with respect to each of the three "foreign material" and "debris" problems have been successful. See PG&E Findings M-A148 (problem with debris inside containment RHR recirculation sump has not recurred since 1989); M-A150 (1992 problem with debris in containment but outside sump did not recur during 1993 Unit 2 fifth refueling outage); M-A153 (corrective actions for 1988 foreign material exclusion issues have enhanced already successful program). Moreover, the NRC Staff witness and Mr. Dillard both testified as to the current excellent condition of the plant in a general housekeeping sense. See PG&E Finding M-156. As stated elsewhere, the fact that an issue of this type may require continued management vigilance to assure continued personnel performance, does not suggest that corrective actions have been insufficient or that existing procedures are in any sense flawed.

Steam Generator Feedwater Nozzle Cracking

R-A99: MFP proposed Findings 549, 552, and 553 claim that PG&E's response to steam generator feedwater nozzle indications identified in 1992 was inadequate. MFP cites similar inspections of the nozzle welds in response to an NRC Information

Notice issued thirteen years earlier. This event, according to MFP, is an example of PG&E's programmatic inability to detect and correct "aging effects." MFP Finding 37.

R-A100: PG&E addressed the specifics of this issue in PG&E Findings M-A157 - M-A161. The incident most compellingly evidences a proactive and effective maintenance and surveillance program. PG&E Finding M-A161. The problem was identified before the indications exceeded code allowables and would have been detected during even a normal surveillance interval. PG&E has addressed the general "aging effects" arguments in Reply Findings R5, R17, and R45-R47.

R-A101: MFP's specific proposed findings on this issue can best be described as an attempt to recast the record. MFP's argument relies on the unfounded speculation that previous incomplete radiography of the nozzles, although concededly not safety significant, nonetheless was "so blatant" and "could have led to a serious safety risk had the rate of cracking been more rapid," that it indicts the entire PG&E maintenance program. MFP Finding 552. The simple answer is that MFP's "could haves" have no place in findings, and certainly have no support in the record. The bottom line on this event was best expressed by the record evidence MFP consistently ignores, the NRC's SALP report, where PG&E's actions on this matter were described as "strong," "state-of-the-art," and "conservative." See PG&E Exhibit 20 at 14.

Procedural Controls During Shot Peening

R-A102: As discussed in PG&E's Findings M-A162 - M-A166, this incident is only peripherally related to maintenance. It is entitled to no evidentiary weight.

R-A103: MFP attempts to draw this issue into the scope of Contention I by arguing as to the effectiveness of various corrective actions (see MFP Findings 561). However, these arguments are beside the point. Contention I is a maintenance and surveillance contention, not a "corrective actions" contention. No problem relating to equipment was involved, and the NRC Staff and PG&E witnesses agreed that the issue was health physics-related, not maintenance-related. PG&E Findings M-A162 - M-A164; see also Reply Findings R56, R65.

R-A104: Even if this incident is held to be peripherally related to maintenance, it was isolated. Moreover, similar problems did rot recur when steam generator shot peening was performed during the next outage (PG&E Findings M-A165, M-A166), illustrating effective corrective actions.

Unplanned Engineered Safety Features ("ESF") Actuations

R-A105: This issue has been adequately addressed in PG&E Findings M-A167 - M-A172, and in Reply Finding R43.

Limitorque Valve Failure

R-A106: This issue has been adequately addressed in PG&E Findings M-A176 - M-A178, and in Reply Finding R72.

Motor Pinion Keys in Limitorque Motor Operators

R-A107: This issue has been adequately addressed in PG&E Findings M-A182 - M-A184, and in Reply Findings R21, R56, and R77.

Control of Lifting and Rigging Devices

R-A108: In this category MFP combines two separate events that have no clear link: (1) a 1991 loss-of-offsite power ("LOOP") event caused by a mobile crane coming too close to an energized 500kV transmission line, and (2) an incident in the rigging and adjusting of the lid on a waste shipping cask. PG&E Finding M-A185. The two issues have been thoroughly analyzed in PG&E Findings M-A185 - M-A191.

R-A109: MFP's analysis of the LOOP event (in proposed Findings 606-621) is an excellent example of MFP's microscopic approach to the exhibits. MFP has found in the NCRs, LERs, inspection reports, and other correspondence, every different characterization of causes and contributory factors. MFP then uses this as a basis to claim that there was a programmatic breakdown.

PG&E has addressed this "multiple barrier" argument in Reply Findings R48-R52. The MFP approach focuses too heavily on a "breakdown" in one case, as opposed to focusing on a "pervasive failure" to implement the maintenance program as discussed in the Callaway case. The specific example, without more, does not prove the general finding MFP would make.

R-A110: MFP also lists (in proposed Findings 619-621) all the systems that were affected by the LOOP. This, however, is not germane to the question of whether PG&E has implemented "an effective and comprehensive surveillance and maintenance program" (see Contention I).

R-A111: MFP's proposed findings with respect to the waste shipping cask incident (Findings 622-630) focus on trying to identify a link to maintenance. MFP identifies that a Mechanical Maintenance foreman supervised the activity, and that Maintenance personnel were involved in the post-incident discussions. MFP Finding 626. This tangential involvement, however, does not change the fact, as testified to by two witnesses, that the activity involved was not a maintenance activity. Tr. 1628-29 (Giffin); 2249 (Miller).

R-A112: MFP also applies its microscope to this incident and cites it as an example of poor communication, coordination, and lack of recognition of shared responsibility. MFP Finding 626.

These charges are particularly ironic, because they are based on PG&E's own correspondence referencing Maintenance's involvement in the corrective actions -- an obvious recognition by PG&E of shared responsibility, as well as an example of communication and coordination. See also Reply Findings R55-R58.

R-A113: Finally, MFP attempts to link these two issues together. MFP Findings 629-633. However, there remains no evidence linking the two. See PG&E Finding M-A190. Moreover, there is no evidence linking this to any other incident addressed in the record. Therefore, there is no basis on which to conclude that there is a pervasive problem in the area of control of lifting and rigging devices for heavy loads. See PG&E Finding M-A191.

Main Feedwater ("MFW") Pump Overspeed Trip

R-A114: In proposed Finding 643, MFP asserts that the recurring failure of a non-safety-related inverter between May 1990 and March 1992 indicates that PG&E's corrective maintenance for such failures was ineffective. The circumstances are explained in PG&E Findings M-A192 - M-A197.

R-A115: MFP fails to cite any support to contradict the record evidence which indicates that this issue was not a maintenance or surveillance issue at all, but a design engineering issue. See PG&E Finding M-A195. Furthermore, throughout the

sequence of events, PG&E was diligently pursuing corrective maintenance to fix the problems with the inverters as they occurred, even though the ultimate solution was a design change. See PG&E Finding M-A194. Similarly, MFP has completely failed to confront the record evidence that this matter -- involving a non-safety-related component -- was, according to the NRC, at a "very low level" of significance. See PG&E Finding M-A197.

Containment Ventilation Isolation ("CVI") Signals

R-A116: This issue has been adequately addressed in PG&E Findings M-A198 - M-A203, and in Reply Finding R43.

Reactor Trip on Steam Generator Low Level

R-A117: This issue involves a personnel error by a carpenter while erecting a scaffold in 1991. It is accurately and succinctly described in PG&E Findings M-A208 - M-A211. It has little value in a programmatic assessment.

R-A118: MFP asserts (in proposed Finding 702) that prior corrective actions, to protect sensitive plant equipment when scaffolding is being erected, were ineffective in that they did not prevent this incident. In support of this finding, MFP cites PG&E's own analysis of a similar previous event which had resulted in new procedures controlling scaffolding. See MFP Finding 703;

MFP Exhibit 156 at 8-9, 13. This is the type of argument -- turning the root cause process inside out to attack PG&E -- addressed generally in PG&E's Reply Findings R41 and R51. In this case, however, MFP fails also for lack of support for its thesis in the NCR itself. The 1991 incident resulted from a personnel error, not from ineffective corrective actions in 1989.

R-A119: PG&E concluded in the 1991 NCR (MFP Exhibit 156) that the revised procedures had not precluded the 1991 event because they did not define sensitive equipment that would require additional review before use of scaffolding. MFP Exhibit 156 at 9, 13. However, PG&E's analysis also concluded that this procedural deficiency was only a contributory cause, not the root cause of the 1991 event. The root cause was personnel error; the personnel involved clearly understood the general requirements that they stay 2' to 3' away from piping, but nonetheless the carpenter inadvertently hit and closed a valve with the scaffolding. Id. at 15. This single incident, fundamentally caused by a personnel error, simply does not support an overall finding of ineffective corrective actions for maintenance problems.

R-A120: MFP Proposed Finding 693 concludes that this event also indicates "multiple maintenance deficiencies" in such areas as personnel errors, deficient planning, equipment weakness, insufficient maintenance, and communication and procedure inadequacies. These multiple deficiencies, MFP says, support its

general finding that PG&E is subject to a "pattern" of repetitive problems relating to insufficient communication, personnel errors, and inadequate procedures. PG&E has responded to these general findings in Reply Findings R48-R52 ("multiple barriers"), and R55-R58 ("inadequate coordination"). The record evidence on this one incident also indicates that it raises no programmatic concerns regarding PG&E's overall maintenance program. See PG&E Finding M-A211.

Auxiliary Saltwater ("ASW") Pump Crosstie Valve

R-A121: This issue is addressed in PG&E Findings M-A212 - M-A215. It involved rust on the hand wheel for an ASW pump crosstie valve. The condition was corrected. PG&E Finding M-A212. The valve was capable of remote operation from the control room. PG&E Finding M-A213. Surveillance procedures were revised and the frequency of preventive maintenance increased. PG&E Finding M-A215. There is nothing of programmatic significance here.

R-A122: In proposed Findings 706, 715, and 720- 722, MFP nonetheless asserts variations on its proposed general findings that PG&E's responses to maintenance problems, including responses to "aging effects," are untimely and its surveillance program is inadequate. See MFP Findings 34, 37, 50. Moreover, MFP proposed Findings 710-715 claim that PG&E's safety analysis of this event

was deficient, contributed to PG&E's untimely response, and therefore is an example of PG&E's improper safety analyses generally. See MFP Findings 29, 30. All of these general findings are shown to be without merit in PG&E's Reply Findings.

Testcock Valve on Diesel Generator

R-A123: This issue has been adequately addressed in PG&E Findings M-A216 - M-A219. See also Reply Findings R65, R79.

R-A124: It is worth noting, however, that MFP claims that this one very minor issue supports multiple general findings, including those regarding untimely detection of "aging" (MFP Finding 37); "repetitive" examples of insufficient communication (MFP Finding 46); inadequate surveillance (MFP Finding 50); and failure to detect manufacturer or vendor deficiencies (MFP Finding 59). However, nowhere in the specific findings on this issue does MFP cite its rationale or record support for why this event supports these general findings.

R-A125: The only similar event cited by MFP in its specific discussion of this issue is the event in which PG&E found a defect in motor pinion keys in certain Limitorque motor operators. These two incidents, MFP proposed Finding 727 seems to argue, indicate a weakness in PG&E's overall surveillance program because, although both involved conditions detected by surveillance

tests, they were detected by serendipity rather than intent. The argument seems entirely irrelevant. The evidence of record indicates that both of these issues were isolated, minor maintenance matters which PG&E, whether serendipitously or not, found and fixed. In contrast, there is no evidence of "vendor defects" or "aging effects" that have not been detected. Likewise, there is no evidence of particular surveillances PG&E should be performing to detect these hypothetical conditions. On this record, it is impossible to conclude that there is a generic program inadequacy.

Leaking Main Feedwater Check Valve

R-A126: MFP proposed Findings 735, 738, 743, 746, 749, and 750 assert that PG&E was untimely in performing corrective maintenance on a leaking check valve during 1990, and that this untimeliness was attributed in part to poor communication between operators and maintenance personnel. These issues have been thoroughly addressed in PG&E Findings M-A225 - M-A231.

R-A127: MFP's proposed findings boil down to a concern not with maintenance, but with PG&E's decision to continue operating the plant with the leaking check valve. This is a concern which is outside the scope of Contention I. Moreover, no evidence suggests that this decision was inappropriate in any way. PG&E Finding M-A227.

R-A128: The NRC Staff's concern with this issue also was unrelated to maintenance. See PG&E Finding M-A229. However, even if maintenance were at issue, the record is clear that the valve leakage was known, corrective maintenance was scheduled and performed, and the problem was fixed. See PG&E Finding M-A230. MFP cites nothing in the record to support its argument that this event somehow indicates a programmatic breakdown in PG&E's maintenance program.

ASW Pump Vault Drain Check Valves

R-A129: This issue is appropriately addressed in PG&E Findings M-A232 - M-A234. MFP repeatedly characterizes this issue as a problem, breakdown, or deficiency. However, the record is clear that the issue of debris in a check valve in the drain line was not significant in any sense. PG&E Finding M-A233. And the reason the NCR was initiated in the first place (work on two drain lines at the same time) was not a non-conformance at all. PG&E Finding M-A234. In its discussion (proposed Findings 754-757) of breakdowns, multiple errors, and failed barriers, MFP seems to lose sight of the conclusion of the documents on which it relies. (Moreover, the specious "multiple barrier" argument has been addressed in detail in Reply Findings R48-R52.)

Failed Limitorque Operator due to Misinstalled Declutch Fork (SI-1-8805A)

R-A130: This issue has been adequately addressed in PG&E Findings M-A235 - M-A239, and in Reply Findings R73 and R77.

Fire in Electrical Panel

R-A131: This issue has been adequately addressed in PG&E Findings M-A240 - M-A242, and in Reply Finding R85.

Chemical and Volume Control System ("CVCS") Leakage

R-A132: PG&E Findings M-A243 - M-A244 accurately describe two issues (one in 1991 and one in 1992) of leakage from a CVCS valve bonnet. The record shows that the two issues derived from separate root causes, that corrective actions for the first were adequate and could not have prevented the second, and that corrective maintenance has been performed. PG&E Findings M-A244 - M-A246. There is in this issue no programmatic significance. See also Reply Findings R4, R11 (regarding the overall performance of Diablo Canyon equipment) and I 12, R28-R29 (regarding PG&E's root cause capability and corrective action performance).

R-A133: MFP takes these same two valve leakage occurrences as a basis to conclude that the preventive maintenance program is insufficient (Finding 773) and that the program is

"plagued with an array of problems" (Finding 784). MFP, however, is well out ahead of the evidence. MFP is again engaging in a microscopic review of an NCR -- with its thorough assessments of root causes and contributory factors -- to find evidence of purported macroscopic problems. This approach is contrary to the Board's standard of review (see Reply Findings R1-R2) and a sound reading of an NCR (see Reply Findings R41, R51). The Board cannot assign programmatic significance to operational experience of low safety significance that has been identified by PG&E and corrected.

R-A134: MFP argues also that this one incident, in and of itself, has "safety significance." This opinion is contradicted by testimony in the record. See NRC Staff Finding I-311.

APPENDIX B

INDEX TO FINDINGS ON SPECIFIC
INCIDENTS AND ISSUES

Topic	PG&E Findings	PG&E Reply Findings
Telatemp Monitoring	M12, M39-M48	R-1 - R-A9
Check Valves	M-A1 - M-A7	R-A10 - R-A17
4 kV and 12 kV Cable Failures	M-A8 - M-A18	R32, R46, and R64; R-A18 - R-A26
Motor Installation/MOV Actuator	M-A19 - M-A22	R21; R-A27 - R-A30
Handling Lubricants	M-A25 - M-A29	R42; R-A31 - R-A34
Fuel Handling Building	M-A40 - M-A44	R46 and R86; R-A35 - R-A37
Containment Airlock Tests	M-A45 - M-A51	R-A38 - R-A40
CCW HX Fretting	M-A52 - M-A54	R47; R-A41 - R-A43
Aux. Building Ventilation	M-A57 - M-A59	R57; R-A44 - R-A46
Electrical Panel Covers	M-A60 - M-A63	R58; R-A47 - R-A52
Equipment Hatch Gap	M-A64 - M-A66	R41 and R71; R-A53 - R-A54
Fuse Failure	M-A67 - M-A68	R-A55 - R-A56
Limitorque 2-FCV-37 (quad ring)	M-A69 - M-A71	R20, R47 and R60; R-A57 - R-A58
ECCS Accumulator Tanks	M-A72 - M-A75	R33, R37, R47 and R84; R-A59
Piping Corrosion	M-A76 - M-A81	R38-R39, R46 and R74; R-A60 - R-A61
M&TE	M-A82 - M-A85	R40; R-A62
Charging Pump Degraded Coupling	M-A88 - M-A89	R-A63 - R-A64
Turbine Stop Valve Inoperable	M-A90 - M-A91	R61; R-A65 - R-A66
DG 2-2 Voltage Failure	M-A92 - M-A94	R60; R-A67 - R-A69
Missed Surveillance Tests	M-A95 - M-A99	R52; R-A70
AFW Pump Test Procedure	M-A100 - M-A102	R65; R-A71 - R-A72
Charging Pump Hold Down Bolts	M-A103 - M-A105	R80; R-A73 - R-A76

Topic	PG&E Findings	PG&E Reply Findings
RCS Leakage	M-A106 - M-A109	R47; R-A77 - R-A79
Reactor Cavity Sump Wide Range Level	M-A110 - M-A116	R34 and R65; R-A80 - R-A82
DCM Requirements	M-A117 - M-A120	R-A83 - R-A86
Isolated Snubber Damage	M-A121 - M-A124	R-A87 - R-A90
Gas Decay Tank Surveillance	M-A125 - M-A129	R66; R-A91
Seismic Clips	M-A132 - M-A134	R58; R-A92 - R-A93
CFCUs	M-A135 - M-A144	R21, R34 and R86; R-A94 - R-A96
Debris Issues	M-A145 - M-A156	R74; R-A97 - R-A98
SG Feedwater Nozzle Cracking	M-A157 - M-A161	R47; R-A99 - R-A101
Shot Peening Rad. Controls	M-A162 - M-A166	R56 and R65; R-A102 - R-A104
ESF Actuations	M-A167 - M-A175	R43; R-A105
Limitorque Valve Failure (spring pack)	M-A176 - M-A178	R60, R72 and R80; R-A106
Limitorque Motor Pinion Keys	M-A182 - M-A184	R21, R56 and R77; R-A107
Lifting and Rigging Controls	M-A185 - M-A191	R-A108 - R-A113
MFW Pump Overspeed Trip (inverter)	M-A192 - M-A197	R-A114 - R-A115
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Reactor Trip - SG Low Level	M-A208 - M-A211	R-A117 - R-A120
ASW Pump Crosstie Hand Wheel	M-A212 - M-A215	R-A121 - R-A122
DG Testcock Valve	M-A216 - M-A219	R65 and R79; R-A123 - R-A125
Leaking MFW Check Valve	M-A225 - M-A231	R-A126 - R-A128
ASW Pump Vault Drain Valves	M-A232 - M-A234	R-A129
Failed Limitorque (declutch fork)	M-A235 - M-A239	R73 and R77; R-A130
Electrical Panel Fire	M-A240 - M-A242	R85; R-A131
CVCS Valve Leakage	M-A243 - M-A246	R-A132 - R-A134