

Enclosure
Attachment 5
PG&E Letter DCL-10-028

**Summary Statement of Diablo Canyon Power Plant PRA Model Capability for Use
in TS 3.8.1 Completion Time Extension submittal**

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Completion Time Extension submittal**

Introduction

Pacific Gas & Electric Company (PG&E) employs a multi-faceted approach to establishing and maintaining the technical adequacy and plant fidelity of the PRA model for the operating PG&E nuclear generation plant. This approach includes both a proceduralized PRA maintenance and update process, and the use of self-assessments and independent peer reviews. The following information describes this approach as it applies to the Diablo Canyon Power Plant (DCPP) PRA.

PRA Maintenance and Update

The PG&E risk management process ensures that the applicable PRA model remains an accurate reflection of the as-built and as-operated plants. This process is defined in the PG&E risk management program, which consists of a governing procedure PRA-ADM. This procedure delineates the responsibilities and guidelines for updating the full power internal events PRA models at the Diablo Canyon Power Plant. The overall PG&E risk management program, including PRA-ADM, defines the process for implementing regularly scheduled and interim PRA model updates, for tracking issues identified as potentially affecting the PRA models (e.g., due to changes in the plant, errors or limitations identified in the model, industry operational experience), and for controlling the model and associated computer files. To ensure that the current PRA model remains an accurate reflection of the as-built, as-operated plant, the following activities are routinely performed:

- Design changes and procedure changes are reviewed for their impact on the PRA model.
- New procedures and procedure changes are reviewed for their impact on the PRA model.
- New engineering calculations and revisions to existing calculations are reviewed for their impact on the PRA model.
- Equipment unavailabilities are captured, and their impact on CDF is trended.
- Plant specific initiating event frequencies, failure rates, and maintenance unavailabilities for equipment that can have a significant impact on the PRA model are updated approximately every 6 years. The last update was completed in March, 2003.

In addition to these activities, PG&E risk management procedures provide the guidance for particular risk management and PRA quality and maintenance activities. This guidance includes:

- Documentation of the PRA model, PRA products, and bases documents.
- The approach for controlling electronic storage of Risk Management (RM) products including PRA update information, PRA models, and PRA applications.
- Guidelines for updating the full power, internal and external events PRA models for the Diablo Canyon Power Plant.
- Guidance for use of quantitative and qualitative risk models in support of the On-Line Work Control Process Program for risk evaluations for maintenance tasks (corrective maintenance, preventive maintenance, minor maintenance, surveillance tests and modifications) on systems, structures, and components (SSCs) within the scope of the Maintenance Rule (10CFR50.65 (a)(4)).

In accordance with this guidance, regularly scheduled PRA model updates nominally occur on an approximately 4-year cycle; longer intervals may be justified if it can be shown that the PRA continues to adequately represent the as-built, as-operated plant. PRA model updates were also performed in shorter intervals in the past to incorporate design changes, procedure changes and/or newly developed industry data and models that may have a significant impact on the plant risk results. The most recent update of the DCCP PRA model (designated as DC01) was completed in June 2006. This year PG&E has committed to complete the Internal Fire PRA, component database update and identify plant and procedural changes and perform a screening to determine their significance with respect to the potential impact on the PRA.

PRA Self Assessment and Peer Review

Several assessments of technical capability have been made, and continue to be planned, for the DCCP PRA models. These assessments are as follows:

- An independent PRA peer review (certification) was conducted using the Westinghouse Owners Group (WOG) Peer Review Certification Guidelines in May, 2000 and the final report for the peer review was published in August, 2000 [Reference 1].
- In addition to the WOG Peer Review, recent limited scope and independent assessments of the DCCP Level 1 and Level 2 PRA models have been performed by leading industry PRA experts (i.e., Gap Analyses) to support several risk-informed applications, including the MSPI calculations and DCCP's transition to the National Fire Protection Association (NFPA) 805 Standard [Reference 2]:

1. Scientech/Jacobsen Engineering reviewed the Diablo Canyon Internal Flood PRA [B3] to identify any specific weaknesses in its approach or implementation which might impair its ability to be used for risk informed decision making [Reference 3]. The approach for the review was to compare the method of implementation and documentation of the existing Internal Flooding PRA with the requirements of the ASME PRA standard Addendum B (March 17th 2005 Draft) [Reference 4].
 2. A self-assessment of the Diablo Canyon Level 1 Internal Events PRA was conducted by ERIN Engineering and Research, Inc. and the results were published in December 2006 [Reference 5] and then updated in January 2008 [Reference 6]. One aim of the self-assessment is to identify Supporting Requirement (SR) for which the DCPD PRA may not meet the ASME PRA STD RA-Sb-2005 Capability Category II requirements.
 3. A follow-on peer review of the upgraded Human Reliability Analysis (HRA) was performed by ABS Consulting, Inc. The upgrade of the HRA was performed in response to the findings of the WOG Peer Review. The findings were published in July 2007 [Reference 7].
 4. The Level 2 portion of the DCPD PRA model was assessed by Westinghouse in support of the RITSTF Initiative 5-b. The findings and their resolution/disposition for DCPD was published in November 2007 [Reference 8].
- The DCPD PRA model results were evaluated in the PWR Owners Group PRA cross-comparisons study performed in support of the implementation of the mitigating systems performance indicator (MSPI) process [Reference 9]. DCPD did not have any identified outliers as a result of the review.
 - PG&E also track issues/problem/errors associated with the PRA model and plant design and procedure changes that affect the PRA model that were identified by the PRA engineers. These issues were recorded in the PRA Action Tracking Database. Depending on the safety significance of these issues, some of them were either addressed by updating the affected portion(s) of the PRA model immediately or disposed off during the periodic update of the PRA model. Open items will be addressed in future model updates.

Two "A" F&Os from the WOG Peer Review, related to the human reliability analysis (HRA) were addressed by upgrading the methodology used for the evaluation. The upgraded HRA analysis was subjected to a focused peer review as indicated above. The "B" F&Os from the WOG Peer Review were addressed during model updates in support of the EDG Completion Time Extension (CTE) license amendment request (LAR), the LAR effort to extend the Completion Times (CTs) for several emergency core cooling system (ECCS) components, and the MSPI calculations. All the "B" F&Os had therefore been addressed and closed out with the completion of the current model of record (DC01 PRA model) and there are no outstanding issues ("B" F&Os) from the WOG Peer Review.

The results of the independent assessments of the DCPD Level 1 and Level 2 PRA models (that is, Gap Analyses) by leading industry PRA experts are presented below.

Most of the review comments/finding from the review the DCPD Internal Flood PRA was on the lack of documentation. There were a few issues/deficiencies from the review and recommendations for improvement in some of the areas of the DCPD Internal Flooding PRA for the PRA to meet at least the Capability Category II requirements were provided by the reviewer. The impact of these issues on the application is also provided in Attachment A.

All the findings of the self-assessment of the Diablo Canyon Level 1 Internal Events PRA performed by ERIN Engineering and Research, Inc. have been resolved and with the exception of the three supporting requirements associated with the human reliability analysis. These HRA related findings were also confirmed via the focused HRA peer review performed by ABS Consulting, Inc.

The focused HRA peer review identified eighteen issues that did not meet category level II of the PRA Standard Seven of these were documentation issues or did not affect the results of the application. The remaining eleven were subsequently either dispositioned or were demonstrated to have a negligible effect on the results of this application as discussed in Attachment A.

There were several findings from the review (by Westinghouse) of the Level 2 portion of the DCPD PRA model. Recommended resolution/disposition of these findings was also provided by the reviewers. An evaluation of the impact of these findings on the application is discussed in Attachment A.

Also provided below are discussions of the items from the DCPD PRA Action Tracking Database that have not been disposed and may potentially affect the risk results from the DCPD PRA model.

DCPD plans to dispose those open items/unresolved issues pertaining to HRA, and unresolved issues from the DCPD PRA Action Tracking Database this year and those pertaining to the Internal Flooding analysis and Level 2 analysis in the following year.

General Conclusion Regarding PRA Capability

The DCPD PRA maintenance and update processes and technical capability evaluations described above provide a robust basis for concluding that the PRA is suitable for use in risk-informed portion of the TS 3.8.1 Completion Time Extension licensing actions. As specific risk-informed PRA applications are performed, remaining gaps to specific requirements in the PRA standard will be reviewed to determine which, if any, would merit application-specific sensitivity studies in the presentation of the application results.

References

1. Diablo Canyon Power Plant Probabilistic Risk Assessment Peer Review Report, Final Report, August 2000
2. National Fire Protection Association (NFPA) 805 Standard
3. "Review and Reevaluation of Specific Issues of internal Floods Analysis" (Draft), Jacobsen Engineering, January 2006
4. American Society of Mechanical Engineers (ASME) RA-Sb-2003, Addenda to ASM RA-S-2002, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," dated March 17, 2005 (draft)
5. Diablo Canyon Power Plant PRA Self-Assessment (Draft Report), ERIN Engineering and research, December 2006.
6. Diablo Canyon Power Plant PRA Self-Assessment, ERIN P0114060001-2717 R1, January 2008
7. Diablo Canyon Follow-On Peer Review of HRA Update, Final Report, R-1736044-1728, July 31, 2007.
8. Transmittal of Resolution/Disposition of ASME PRA Peer Review Findings for LERF for Diablo Canyon Units 1 and 2, LTR-RAM-II-07-021, November 30, 2007.
9. WCAP-16464-NP, "Westinghouse Owner's Group Mitigating Systems Performance Index Cross Comparison," Revision 0, August 2005.

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