



**Pacific Gas and  
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**James M. Welsch**  
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August 2, 2012

PG&E Letter DCL-12-069

10 CFR 50.90

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Docket No. 50-275, OL-DPR-80  
Docket No. 50-323, OL-DPR-82  
Diablo Canyon Units 1 and 2

Submittal of Quality Assurance Plan and Revised Phase 1 Documents for the  
License Amendment Request for Digital Process Protection System Replacement

- References:
1. PG&E Letter DCL-11-104, "License Amendment Request 11-07, Process Protection System Replacement," dated October 26, 2011 (ADAMS Accession No. ML11307A331).
  2. Digital Instrumentation and Controls DI&C-ISG-06 Task Working Group #6: "Licensing Process Interim Staff Guidance," Revision 1, January 19, 2011 (ADAMS Accession No. ML110140103).
  3. NRC Letter "Diablo Canyon Power Plant, Unit Nos. 1 and 2 - Acceptance Review of License Amendment Request for Digital Process Protection System Replacement (TAC Nos. ME7522 and ME7523)," dated January 13, 2012.
  4. NRC Letter "Summary of June 13, 2012, Teleconference Meeting with Pacific Gas and Electric Company on Digital Replacement of the Process Protection System Portion of the Reactor Trip System and Engineered Safety Features Actuation System at Diablo Canyon Power Plant (TAC Nos. ME7522 and ME7523)," dated June 27, 2012 (ADAMS Accession No. ML12170A866).
  5. Invensys Operations Management Letter, "Invensys Operations Management Letter Submittal to Support License Amendment Request from PG&E for Replacement of the Eagle 21 Process Protection System at Diablo Canyon Power Plant," dated October 26, 2011 (ADAMS Accession No. ML113190392).

Dear Commissioners and Staff:

In Reference 1, Pacific Gas and Electric (PG&E) submitted License Amendment Request (LAR) 11-07 to request NRC approval to replace the Diablo Canyon Power

Attachments 9-11 to the Enclosure contain Proprietary Information  
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Plant (DCPP) Eagle 21 digital process protection system (PPS) with a new digital PPS that is based on the Invensys Operations Management Tricon Programmable Logic Controller, Version 10, and the CS Innovations, LLC (a Westinghouse Electric Company), Advanced Logic System. The LAR format and contents in Reference 1 are consistent with the guidance provided in Enclosure E and Section C.3, respectively, of Digital Instrumentation and Controls (I&C) Revision 1 of Interim Staff Guidance Digital I&C-ISG-06, "Licensing Process" (ISG-06) (Reference 2). In Reference 3, the NRC staff documented its acceptance of Reference 1 for review.

The PG&E Quality Verification group has developed the quality assurance plan document "Quality Assurance Plan for the Diablo Canyon Process Protection System Replacement". This plan is contained in Attachment 1 to the Enclosure and addresses the Open Item Number 27 contained in Enclosure 2 of Reference 4.

PG&E has revised the ISG-06 Phase 1 documents, "DCPP Units 1 & 2 PPS Replacement Functional Requirements Specification (FRS)" and the "DCPP Units 1 & 2 PPS Replacement Interface Requirements Specification (IRS)." The revised "DCPP Units 1 & 2 PPS Replacement FRS, Revision 5," and the "DCPP Units 1 & 2 PPS Replacement IRS, Revision 6," are contained in Attachments 2 and 3 to the Enclosure, respectively. These revised FRS and IRS documents supersede the documents previously submitted in Attachments 7 and 8 to the Enclosure of Reference 1, respectively.

Invensys Operations Management has created document "993754-1-916, V10 Tricon Reference Design Change Analysis," that addresses the impact of changes between Tricon version 10.5.1 and Tricon version 10.5.3. Tricon version 10.5.3 is intended to be installed for the Diablo Canyon PPS replacement. The Invensys Operations Management document "993754-1-916, V10 Tricon Reference Design Change Analysis, Revision 0" is contained in Attachment 4 to the Enclosure.

Invensys Operations Management submitted, in Reference 5, the following Invensys Operations Management ISG-06 Enclosure B Phase 1 Tricon documents to support Reference 1; "993754-1-802, Revision 1, Software Verification and Validation Plan," "993754-1-813, Revision 0, Validation Test Plan," and "993754-1-906, Revision 0, Software Development Plan." These Invensys Operations Management documents have been revised to address NRC comments contained in Enclosure 2 of Reference 4. The non-proprietary versions of the Tricon Software Verification and Validation Plan, Validation Test Plan, and Software Development Plan are contained in Attachments 5, 6, and 7 of the Enclosure, respectively, and the proprietary versions are contained in Attachments 9, 10, and 11 of the Enclosure, respectively. These revised Tricon documents supersede the documents previously submitted in Reference 5.

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This letter contains Invensys Operations Management documents contained in Attachments 9, 10, and 11 to the Enclosure that contain information proprietary to Invensys Operations Management. Accordingly, Attachment 8 to the Enclosure includes Invensys Operations Management Affidavit No. 993754-AFF-38T. The affidavit is signed by Invensys Operations Management, the owner of the information. The affidavit sets forth the basis on which the Invensys Operations Management proprietary information contained in Attachments 9, 10, and 11 to the Enclosure may be withheld from public disclosure by the Commission, and it addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR 2.390 of the Commission's regulations. PG&E requests that the Invensys Operations Management proprietary information be withheld from public disclosure in accordance with 10 CFR 2.390. Correspondence with respect to the Invensys Operations Management proprietary information or the Invensys Operations Management affidavit provided in Attachment 8 to the Enclosure should reference Invensys Operations Management Affidavit No. 993754-AFF-38T and be addressed to Roman Shaffer, Project Manager, Invensys Operations Management, 26561 Rancho Parkway South, Lake Forest, CA 92630.

If you have any questions, or require additional information, please contact Tom Baldwin at (805) 545-4720.

This information does not affect the results of the technical evaluation or the significant hazards consideration determination previously transmitted in Reference 1.

This communication does not contain regulatory commitments (as defined by NEI 99-04).

I state under penalty of perjury that the foregoing is true and correct.

Executed on August 2, 2012.

Sincerely,

James M. Welsch  
Interim Site Vice President

kjse/4328 SAPN 50271918

Enclosure

cc: Diablo Distribution

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cc/enc: Gonzalo L. Perez, Branch Chief, California Department of Public Health  
Elmo E. Collins, NRC Region IV  
Michael S. Peck, NRC, Senior Resident Inspector  
Joseph M. Sebrosky, NRR Project Manager  
Alan B. Wang, NRR Project Manager

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PG&E Letter DCL-12-069

**Submittal of Quality Assurance Plan and Revised Phase 1 Documents for the  
License Amendment Request for  
Digital Process Protection System Replacement**

In Pacific Gas and Electric (PG&E) Letter DCL-11-104, "License Amendment Request 11-07, Process Protection System Replacement," dated October 26, 2011 (ADAMS Accession No. ML11307A331), PG&E submitted License Amendment Request (LAR) 11-07 to request NRC approval to replace the Diablo Canyon Power Plant (DCPP) Eagle 21 digital process protection system (PPS) with a new digital PPS that is based on the Invensys Operations Management Tricon Version 10 programmable logic controller and the CS Innovations, LLC (a Westinghouse Electric Company), field programmable gate array based Advanced Logic System. The LAR 11-07 format and contents are consistent with the guidance provided in Enclosure E and Section C.3, respectively, of Digital Instrumentation and Controls (I&C) Revision 1 of Interim Staff Guidance Digital I&C-ISG-06, "Licensing Process" (ISG-06). The staff documented its acceptance of LAR 11-07 for review in the NRC Letter "Diablo Canyon Power Plant, Unit Nos. 1 and 2 - Acceptance Review of License Amendment Request for Digital Process Protection System Replacement (TAC Nos. ME7522 and ME7523)," dated January 13, 2012.

The PG&E Quality Verification group has developed the quality assurance plan (QAP) document "Quality Assurance Plan for the Diablo Canyon Process Protection System Replacement". The QAP describes the oversight activities to be performed by the PG&E Quality Verification group for the PPS replacement at DCPP, including audits, assessments, and source inspections of documents, software, hardware, and vendor services pertaining to the PPS replacement. The QAP plan is contained in Attachment 1 to the Enclosure and addresses the Open Item Number 27 contained in Enclosure 2 of the NRC Letter "Summary of June 13, 2012, Teleconference Meeting with Pacific Gas and Electric Company on Digital Replacement of the Process Protection System Portion of the Reactor Trip System and Engineered Safety Features Actuation System at Diablo Canyon Power Plant (TAC Nos. ME7522 and ME7523)," dated June 27, 2012 (ADAMS Accession No. ML12170A866)".

PG&E has revised the ISG-06 Phase 1 documents, "DCPP Units 1 & 2 PPS Replacement Functional Requirements Specification (FRS)" and the "DCPP Units 1 & 2 PPS Replacement Interface Requirements Specification (IRS)" to reflect the PPS replacement design, correct minor discrepancies, and to provide consistency with other Phase 1 documents. The revised "DCPP Units 1 & 2 PPS Replacement FRS, Revision 5," and the "DCPP Units 1 & 2 PPS Replacement IRS, Revision 6," are contained in Attachments 2 and 3 to the Enclosure, respectively. These revised FRS and IRS documents supersede the documents previously submitted in Attachments 7 and 8 to the Enclosure of LAR 11-07, respectively.



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Invensys Operations Management has created document "993754-1-916, V10 Tricon Reference Design Change Analysis, Revision 0" that addresses the impact of changes between Tricon version 10.5.1 and Tricon version 10.5.3. Tricon version 10.5.3 is intended to be installed for the Diablo Canyon PPS replacement. The Invensys Operations Management document "993754-1-916, V10 Tricon Reference Design Change Analysis, Revision 0" is contained in Attachment 4 to the Enclosure.

Invensys Operations Management submitted in Invensys Operations Management Letter, "Invensys Operations Management Letter Submittal to Support License Amendment Request from PG&E for Replacement of the Eagle 21 Process Protection System at Diablo Canyon Power Plant," dated October 26, 2011 (ADAMS Accession No. ML113190392), the following Invensys Operations Management ISG-06 Enclosure B Phase 1 Tricon documents to support LAR 11-07; "993754-1-802, Revision 1, Software Verification and Validation Plan," "993754-1-813, Revision 0, Validation Test Plan," and "993754-1-906, Revision 0, Software Development Plan." These Invensys Operations Management documents have been revised to address NRC comments contained in Enclosure 2 of the NRC Letter dated June 27, 2012 (ADAMS Accession No. ML12170A866). The non-proprietary versions of the Tricon Software Verification and Validation Plan, Validation Test Plan, and Software Development Plan are contained in Attachments 5, 6, and 7 of the Enclosure, respectively, and the proprietary versions are contained in Attachments 9, 10, and 11 of the Enclosure, respectively. These revised Tricon documents supersede the documents previously submitted in the Invensys Operations Management letter dated October 26, 2011.

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## ATTACHMENTS

1. PG&E Document "Quality Assurance Plan for the Diablo Canyon Process Protection System Replacement"
2. PG&E Document "Diablo Canyon Power Plant Units 1 & 2 Process Protection System Replacement Functional Requirements Specification, Revision 5"
3. PG&E Document "Diablo Canyon Power Plant Units 1 & 2 Process Protection System Replacement Interface Requirements Specification (IRS), Revision 6"
4. Invensys Operations Management Document "993754-1-916, V10 Tricon Reference Design Change Analysis, Revision 0"
5. Invensys Operations Management Document "993754-1-802, Revision 2, Software Verification and Validation Plan" (Non-Proprietary)
6. Invensys Operations Management Document "993754-1-813, Revision 1, Validation Test Plan" (Non-Proprietary)
7. Invensys Operations Management Document "993754-1-906 Revision 1, Software Development Plan" (Non-Proprietary)
8. Invensys Operations Management Affidavit No. 993754-AFF-38T
9. Invensys Operations Management Document "993754-1-802, Revision 2, Software Verification and Validation Plan" (Invensys Operations Management Proprietary)
10. Invensys Operations Management Document "993754-1-813 Revision 1, Validation Test Plan" (Invensys Operations Management Proprietary)
11. Invensys Operations Management Document "993754-1-906 Revision 1, Software Development Plan" (Invensys Operations Management Proprietary)

Attachments 9-11 to the Enclosure contain Proprietary Information - Withhold Under 10 CFR 2.390

Enclosure  
Attachment 1  
PG&E Letter DCL-12-069

**PG&E Document**  
**“Quality Assurance Plan for the**  
**Diablo Canyon Process Protection System Replacement”**

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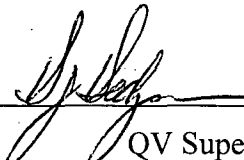
# Process Protection System Project Quality Plan

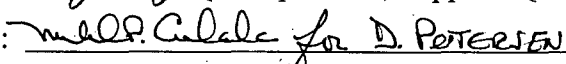
## Quality Assurance Plan

for

### Diablo Canyon Process Protection System Replacement

This plan identifies the key Quality Assurance tasks to be performed for the Process Protection System Replacement at Diablo Canyon . The plan excludes the details of the quality-related Project activities. Each organization participating in this Project is required to perform its quality-related activities in accordance with established approved procedures, policies and guidelines.

Prepared By:  6/24/12  
QV Supervisor, Supplier Quality Date

Approved By:  for D. PETERSEN 7/2/12  
Director, Quality Verification Date

## Process Protection System Project Quality Plan

### 1. Purpose

The purpose of the Project Quality Plan is to define the Quantity Verification oversight requirements for the Process Protection System (PPS) Replacement.

### 2. Responsibilities

#### a. Quality Verification Director

- Overall authority and responsibility for the oversight of those quality assurance programs related to the licensing, procurement, and installation of the PPS replacement.

#### b. Supervisor of Supplier Quality

- Responsible for implementing the requirements of the DCCP Quality Program as defined in Chapter 17 of the FSAR Update for the PPS replacement.

#### c. Project Quality Auditors

- Responsible to perform oversight of the DCCP Project through reviews, audits, assessments, observations, and inspections of the suppliers, subsuppliers, and the Project.

#### d. PPS Replacement Project Manager

- Overall responsibility for the implementation for the PPS replacement and primary interface with Quality Verification.

### 3. References

- 10 CFR 50 Appendix B, Quality Assurance Criteria for Nuclear Power Plants
- Regulatory Guide 1.152, Criteria for Use of Computers in Safety Systems of Nuclear Power Plants, Revision 3
- Regulatory Guide 1.168, Verification Validation, Reviews, and Audits for Digital Computer Software Used in Safety Systems of Nuclear Power Plants, September 1997
- IEEE Standard 1012 – 1998, Standard for Software Verification and Validation
- IEEE Standard 1028 – 1997, Standard for Software Reviews and Audits
- ASME NQA-1, 2008, Part 2, Subpart 2.7 Quality Assurance Requirements for Computer Software for Nuclear Facility Applications.
- Diablo Canyon Power Plant Final Safety Analysis Report Update, Revision 20, Chapter 17, Quality Assurance.



## Process Protection System Project Quality Plan

- h. Program Directive CF2, Computer Hardware, Software, and Database Control
- i. Administrative Procedure AD7.ID8, Project Management
- j. Administrative Procedure AD9.ID1, Procurement of Items and Related Services
- k. Administrative Procedure AD9.ID2, Initiating Procurement of Services
- l. Administrative Procedure CF2.ID9, Software Quality Assurance for Software Development
- m. Administrative Procedure CF3.ID9, Design Change Development
- n. Process Protection System (PPS) Replacement System Quality Assurance Plan (SyQAP) Nuclear Safety Related.

### 4. Oversight Requirements

- a. PG&E Quality Verification will provide oversight of the PPS Replacement through a series of audits, assessments, and source inspections of documents, software, hardware, and vendor services pertaining to the Project.
- b. Assessments
  - PG&E Supplier Quality will review the third party audits of each supplier (Altran, Invensys, Westinghouse and CS Innovations) to ensure that an acceptable quality assurance program is implemented by the supplier. The review shall be documented in an assessment report and note any area requiring additional review/audit.
  - PG&E Quality Verification will review PG&E Project documentation to determine if the correct applicable standards are being implemented. This review shall include project management plans, software development plans, procurement documents and design changes.
- c. Audits
  - PG&E Supplier Quality will perform implementation audits at each of the software/hardware suppliers, Invensys and Westinghouse/CS Innovations. Particular areas to be audited include cyber security and software quality assurance.
  - PG&E Quality Verification will perform a technical audit of the PPS design.
- d. Source Inspections
  - PG&E Supplier Quality will perform source inspections at Invensys and CS Innovations during development and testing

## Process Protection System Project Quality Plan

phases of the Project. The Factory Acceptance Test shall be witnessed

- After system delivery to PG&E, PG&E Supplier Quality will perform routine Observations during system integration and testing at the offsite work area.

### 5. Schedule

- a. PG&E Supplier Quality will perform the review of the third party audits immediately following 1R17. The results should be completed by July 26, 2012. PG&E Quality Verification review of the Project documentation will be commence immediately and should complete in July 26, 2012.
- b. PG&E Supplier Quality will coordinate with Invensys and perform an audit in July. The focus of the audit will be order entry, software development and secure development environment.
- c. PG&E Supplier Quality will coordinate with Westinghouse/CS Innovations and arrange for an audit to be performed during August/September 2012.
- d. Source Inspections will be arranged as necessary based on the project schedule.
- e. Routine observations of Project activities will be performed with the goal of 4 documented observations per month starting in August 2012.



Attachments 9-11 to the Enclosure contain Proprietary Information - Withhold Under 10 CFR 2.390

Enclosure  
Attachment 8  
PG&E Letter DCL-12-069

**Invensys Operations Management Affidavit No. 993754-AFF-38T**

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- c) Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of Invensys Operations Management, its customers, its partners, or its suppliers.
- d) Information which reveals aspects of past, present, or future Invensys Operation Management customer-funded development plans or programs, of potential commercial value to Invensys.
- e) Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.
- f) Information obtained through Invensys Operation Management actions which could reveal additional insights into nuclear equipment qualification processes, customer applications, and regulatory proceedings, and which are not otherwise readily obtainable by a competitor.

Information to be withheld is considered to be proprietary based on 10CFR2.390(a)(4), with consideration of the reasons set forth above.

5. These documents describe the details of a program to qualify Invensys Triconex equipment for 1E application, product design details, and/or customer application approaches. Invensys Triconex is the first manufacturer of a PLC to fully implement the requirements set forth in the EPRI TR-107330, which has been endorsed by the Commission in an SER. Invensys Triconex has expended a significant amount of money and effort involving numerous contractors over more than 10 years to develop and implement an ongoing successful approach to its test programs and nuclear applications. Information developed relating to test plans, approaches, equipment, specific problems encountered, licensing perspectives, application approaches, and lessons learned has significant value because of the resources expended to successfully accomplish this process and the usefulness of this knowledge to potential competitors.

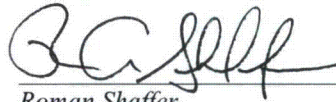
Specific data showing compliance with requirements and demonstrating technical capability of the equipment has substantial commercial value because it provides the basis for qualifying Invensys Triconex equipment and implementing safety-related digital upgrades to nuclear plants. Existing options for digital upgrades in the nuclear industry are limited. We believe that ongoing successful 1E qualification upgrades of the TRICON PLC products and implementation of plant application projects will continue to give Invensys Operations Management a competitive advantage in this field.

Disclosure of information in these documents would cause substantial harm to the competitive position of the Invensys Operations Management, as there are other competing companies who wish to qualify digital PLC controllers and apply them in safety related applications in nuclear power plants. Competing firms could use our experience, successful approaches, and technical information to facilitate their own equipment qualification efforts, application approaches, and/or product design without compensating Invensys Operations Management.

6. Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
  - (i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Invensys Operations Management.
  - (ii) The information is of a type customarily held in confidence by Invensys Operations Management and not customarily disclosed to the public. Invensys Operations Management has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Invensys Operations Management policy and provide the rational basis required.
  - (iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10CFR Part 2.390, it is to be received in confidence by the Commission.
  - (iv) This information is not readily available in public sources.
  - (v) Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Invensys Operations Management because it would enhance the ability of competitors to provide similar design and qualification of PLC systems and associated applications using similar project methods, equipment, testing approach, contractors, or licensing approaches. As

described in section 5, this information is the result of considerable expense to Invensys and has great value in that it will assist Invensys in providing Invensys Triconex digital upgrade equipment and services to a new, expanding markets not currently served by the company.

7. The foregoing statements are true and correct to the best of my knowledge, information, and belief.

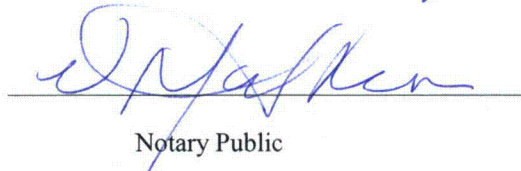


*Roman Shaffer*

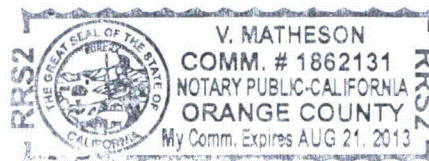
*Project Manager, DCPD PPS Replacement Project  
Invensys Operations Management*

Sworn to and subscribed before me

this 23 day of July, 2012



Notary Public



State of California  
County of Orange  
Subscribed and sworn to (or affirmed) before me  
on this 23 day of July, 2012  
by Roman Shaffer,  
proved to me on the basis of satisfactory evidence  
to be the person(s) who appeared before me.  
Signature V. Matheson (Seal)