Enclosure
Attachment 6
PG&E Letter DCL-12-120

Invensys Operations Management Document
"993754-1-900, Revision 1,
Process Protection System Replacement
Diablo Canyon Power Plant
Project Quality Plan (PQP)"
(Non-Proprietary)

invensys
Operations Management

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Triconex

Project:	**PG&E PROCESS PROTECTION SYSTEM REPLACEMENT**
Purchase Order No.:	3500897372
Project Sales Order:	993754

PACIFIC GAS & ELECTRIC COMPANY

NUCLEAR SAFETY-RELATED PROCESS PROTECTION SYSTEM REPLACEMENT DIABLO CANYON POWER PLANT

PROJECT QUALITY PLAN (PQP)

Document No. 993754-1-900

Revision 1

March 2, 2012

	Name	Signature	Title
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Document Change History

Revision	Date	Changes	Author
0	29 JUL 11	Initial Issue.	S. Dwire
1	02 MAR 12	-Updated with Phase 2 deliverables from PO#3500897372 Revision 6 -IOM-Q2 changed to QM-2 -Section 1.4 requirements document number updated -Added references to specific PPMs	S. Dwire

Table of Contents

1. General

1.1 Background/Purpose

The purpose of this Project Quality Plan (PQP) is to provide planned and systematic quality activities for the design and approval of required Process Protection System (PPS) Replacement documents in accordance with Customer Purchase Order (PO) #3500897372 and Master Service Agreement (MSA) 4600018177.

1.2 Objectives

This PQP is intended to ensure that project deliverables, including project documents supplied to the customer, meet specified quality standards; and that customer contract, Invensys Operations Management quality management system and applicable industry standards requirements are satisfied.

This PQP applies to all deliverables and services provided in satisfaction of the contract, regardless of the System/Safety classification.

1.3 Project Overview

The PPS Replacement documents will be provided appropriately as deliverables in accordance with the customer PO and MSA. The list of documents required includes normal digital design documentation, e.g., Software Requirements Specification (SRS), System Design Description (SDD), test plans, etc.. Phase I of ISG-06 for this project has been completed with the acceptance of the SRS as well as the test plans. This version of the PQP will address the completed Phase 1 and planned Phase 2. Phase 2 requires software code listings as well as test documentation (e.g. test specifications and test reports). Subsequent phases may require additional revisions to this PQP.

1.4 Requirements

This is a Safety Related Class 1E project with Software Integrity Level (SIL) 4 software. Requirements for this project are specified in customer PO #3500897372 and in accordance with the MSA # 4600018177. At a minimum if there is conflict with this PQP and required standards or customer requirements; QM-2 and customer quality requirements shall take precedence. QM-2 satisfies all customer QSL quality clauses and TEC 10CFR21 reporting requirements.

1.5 References

1.5.1. Nuclear System Integration Program Manual (NSIPM), NTX-SER-09-21
1.5.2. Project Management Plan (PMP), 993754-1-905
1.5.3. Nuclear Quality Assurance Manual, QM-2
1.5.4. Software Quality Assurance Plan (SQAP), 993754-1-801
1.5.5. U.S. NRC Digital Instrumentation and Controls Interim Staff Guidance (ISG 06), DI&C-ISG-06, Revision 1

1.5.6. Pacific Gas & Electric Purchase Order #3500897372

2. ORGANIZATION

2.1 Responsibilities

Detailed roles and responsibilities of key Invensys Operations Management personnel are described in 993754-1-905, Project Management Plan (PMP).

2.2 Qualification and Training

This project will be implemented by qualified and trained Invensys personnel. Project training will be provided to project personnel in accordance with Invensys Operations Management Triconex Project Procedure Manual (PPM) 9.0, Personnel Training and the PMP.

3. QA Program Applicability

3.1 QA Program

The Invensys Operations Management System Requirements: Quality Manual (QM-2) and supporting quality management system documentation shall control all work performed under the contract. All process control activities are controlled by applicable quality management system documents. Project activities will be controlled and performed in compliance with these requirements through implementation of QM-2, the Quality Procedure Manual (QPM), and the Nuclear System Integration Program Manual (NSIPM), NTX-SER-09-21; except as specified in Section 3.2 and 3.3 of this plan.

The Triconex QPM, Project Procedure Manual (PPM), and Manufacturing Department Manual (MDM) are the implementing procedures under the NSIPM. These procedures have been verified via external audit, including the NRC, and found compliant with the Invensys (10 CFR 50) Appendix B program as well as NRC requirements for the development of software for safety-related applications in nuclear power plants.

3.2 Project Instructions

When necessary, project management has the authority to develop and implement project-specific Project Instructions (PI) to provide instructions for additional methods/processes for new/unique customer contract-specific requirements. Project Instructions, at a minimum, shall be developed by the PE or designee, reviewed by PQAE and approved by the PM.

3.3 Design Control

Design activities are conducted in accordance with the NSIPM, Section 4.0, Design Control and PPM 2.0, Design Control. The design process includes measures for identification, control of design interfaces, and verification of design adequacy. Specific details for software

design control shall be found in the Software Quality Assurance Plan (SQAP), 993754-1-801.

3.4 Non-Conformances and Corrective Actions

Non-Conformances and Corrective Actions shall be handled in accordance with NSIPM Section 7.0, Nonconforming Items and PPM 10.0, Nonconformance and Corrective Action.

4. NEW and/or UNIQUE Activities

4.1 NRC Interim Staff Guidance 06 (ISG 06)

Project documents shall be developed in accordance with the guidance from Invensys Operations Management Triconex manuals and ISG 06. If the Invensys Triconex manuals and ISG 06 differ significantly in document requirements, the more stringent requirements of the two shall be incorporated.

5. Key Program Areas

Important areas of the QA program which will be emphasized are:

- Surveillance of the engineering activities to verify compliance with the project and quality procedures, project plans, customer purchase order/specifications.
- Review and approval of documents assuring consistent formats, good revision control and not repeating errors throughout the project.
- Periodic audits providing independent reviews and monitoring.

6. QA Monitoring

The PM and project personnel are responsible for the overall quality of the project. In general, quality assurance is verified by:

- Peer review of project documents.
- Review and monitoring of project activities by the PM.

In addition, the assigned Project Quality Assurance Engineer (PQAE) will perform independent quality assurance activities, which include:

- Reviewing project documents for adequacy and completeness.
- Conducting surveillances of project activities to measure and assure program compliance.
- Serving as the primary interface with the customer quality representatives.

Throughout the project, QA will advise the PM on issues relating to quality and will identify potential noncompliance with customer requirements or project QA commitments. QA does not report to the PM and has the organizational freedom to identify quality issues to Invensys senior management, where necessary to resolve conflicts in quality issues.

6.1 Inspection Plan

Invensys Operations Management shall conduct a phase exit surveillance prior to exiting the Requirements, Design, Implementation, and Test Phases before recommending work to begin on documents of the next phase. This will help ensure all inputs of the next phase are verified to be acceptable and approved before beginning activities of that phase.

7. Documentation

All documents generated as a result of this project shall be classified as Quality Records and shall be processed in accordance with NSIPM, Section 10.0, Project Document and Data Control, PPM 3.0, Drawing Preparation and Control, PPM 4.0, Project Document and Data Control and QPM, Section 16.0, Quality Records Retention.

8. Deliverables

Deliverable dates and other specific data for these documents are described in the PMP, 993754-1-905.

Project deliverables to be provided are:

1. System Architecture Description
    a. Hardware Architecture Description
    b. Software Architecture Description
2. V10 Tricon Reference Design Change Analysis
3. 603/7-4.3.2/ISG-04 Conformance Report
4. RG 1.152 Conformance Report
    a. Vulnerability Assessment
    b. Secure Development Environment and Operational Environment Controls
5. Project Management Plan
6. Software Management Plan
7. Software Development Plan
8. Software Safety Plan
9. Software Quality Assurance Plan
10. Software Verification and Validation Plan
11. Software Configuration Management Plan
12. Software Integration Plan

Requirements Phase

13. Hardware Requirements Specification
14. Software Requirements Specification
15. Safety (Criticality/Hazard/Risk) Analysis
16. Validation Test Plan
17. Project Traceability Matrix
18. Requirements Phase Summary Report
    a. Requirements V&V Report

Design Phase

19. Software Design Description

20. Hardware Design Description
21. I/O List
22. Failure Modes and Effects Analysis
23. Safety Analysis (Design Phase Update)
24. Validation Test Specification
25. Software Verification Test Plan
26. Software Verification Test Specification
27. Project Traceability Matrix – Design Phase
28. Design Phase Summary Report
    a. Design Phase V&V Report

Implementation Phase

29. Application Software (PT2 File)
30. I/O List (Implementation Phase Update, if necessary)
31. Software Verification Test Cases
32. Software Verification Test Report
33. Safety Analysis (Implementation Phase Update)
34. Project Traceability Matrix – Implementation Phase
35. Implementation Phase Summary Report
    a. Implementation Phase V&V Report

Test Phase

36. Hardware Validation Test Procedure
37. Factory Acceptance Test Procedure
38. Project Traceability Matrix – Test Phase
39. Hardware Validation Test Report
40. Factory Acceptance Test Report
41. System Response Time Confirmation Report
42. Safety Analysis (Test Phase Update)
43. Final Master Configuration List
44. Test Phase Summary Report
45. Final Verification and Validation Report

Delivery Phase

46. Nuclear Certificate of Conformance
47. Final System Integration Document Package
48. System Delivery

9. Attachments

NONE