ENCLOSURE 14

SCE TOPICAL QA MANUAL

CHAPTER 1-J, REVISION 4

ELECTRONIC DATA PROCESSING CONTROLS

1.0 Introduction

Quality assurance program controls consistent with the provisions of this Section (1-J) of the manual shall be provided for the following:

(a) electronic data processing systems and digital computer systems which are used for Quality Affecting Activities performed by SCE.
(b) Quality Affecting Software used by SCE.

2.0 Applicability

2.1 This Section (1-J) of the manual applies to Quality Affecting Software (used to implement Quality Affecting Activities) whose results are not independently verified on each use.

2.2 This Section (1-J) of the manual is not applicable to software used in performing Quality Affecting Activities if results of the software are independently verified on each use by the procedures implementing the Quality Affecting Activity.

3.0 Responsibilities

3.1 System Sponsor

3.1.1 A System Sponsor shall be designated in writing for Quality Affecting Software by the Cognizant Functional Division Manager (CFDM) or other SCE Manager responsible for the primary Quality Affecting Activity. ID

3.1.2 Responsibilities of supporting divisions shall be documented by the System Sponsor.

3.1.3 The System Sponsor shall be responsible for implementing the requirements of this Section (1-J) of the manual for Quality Affecting Software, except for those paragraphs specifically assigned in writing to a System Implementing Organization.

3.2 System Implementing Organization

3.2.1 The System Sponsor may designate a System Implementing Organization. The designation shall be in writing, and shall specify which responsibilities of the System Sponsor are transferred to the Implementing Organization.

4.0 Software Development

4.1 Software Requirements

4.1.1 The software requirements shall be established for Quality Affecting Software. The requirements shall be documented, reviewed, approved, and shall consider, but are not limited to, the following items:

(a) Functionality/System Description, including specific identification of Quality Affecting Activities and/or data elements.

(b) Interfaces with organizations, hardware, and/or other software.

(c) Human factors, i.e. ergonomics, color schemes.

(d) Portability, accessibility, recoverability and/or maintainability criteria.

(e) Design constraints.

(f) Performance constraints.

(g) Unique training requirements.

Responsibility: System Sponsor

4.2 Software Design

4.2.1 The software design shall implement the software requirements. The design shall be documented, reviewed and approved. The software design shall consider, but is not limited to, the following items:

(a) Data checking routines.

(b) Data flow and control - a description of the flow of the data into, through and out of the software.

(c) Control logic - a description of special logic or rules (algorithms) that may be applied when processing data.

(d) Organization of data.

(e) Inputs and outputs.

(f) Equations.

(g) Coding conventions, where appropriate.

(h) Test plans and test cases.

(i) Acceptance criteria

Responsibility: System Sponsor

4.3 Software Construction

4.3.1 Methods and procedures shall be established to ensure that the software shall be constructed in accordance with the approved software design.

Responsibility: Cognizant Functional Division Manager

4.4 Software Verification and Validation

4.4.1 The software design shall be reviewed to provide verification of the adequacy of the design to meet the software requirements.

4.4.2 The validation process shall demonstrate that the software properly performs the Quality Affecting Activity.

4.4.3 The verification and validation process shall be documented, reviewed and approved to ensure that software and any approved modifications implement the software requirements and the software design, and that other Quality Affecting Activities related to the software continue to function as designed.

Responsibility: System Sponsor

4.5 Procedure Impact Assessment

4.5.1 A procedure impact assessment shall be performed during the analysis or design phase, as appropriate, of the software development cycle.

4.5.2 The assessment shall identify any existing procedures that may require modification and/or the potential need for new procedures.

Responsibility: Cognizant Functional Division Manager

5.0 Software Configuration Control

5.1 Configuration Identification

5.1.1 A labeling methodology shall be developed to uniquely identify each configuration. The methodology shall provide the ability to uniquely identify each configuration of the software available for use and its documentation.

5.1.2 The configuration shall identify the approved software and shall be documented and controlled. This configuration shall include the elements listed below (a through d) and may include data files:

(a) Documents (e.g. requirements, specifications, etc.).

(b) Hardware and operating system software versions.

(c) Software development tool versions (e.g. code generators, compilers, language, CASE tools, etc.).

(d) Other files (JCL, CLIST, .BAT files).

Responsibility: System Sponsor

5.2 Configuration Change Control

5.2.1 A process shall be developed to ensure that changes are controlled and documented.

5.2.2 Changes to software are subject to design control measures as specified in paragraph 4.0. Changes to design documents are reviewed and approved using current or equivalent controls which approved the original design document.

5.2.3 The configuration control process shall also ensure notification of System Sponsors, System Implementing Organizations and Users of the software that a configuration change has occurred.

Responsibility: Cognizant Functional Division Manager

5.3 Data Configuration Control

Methods and procedures shall be established to maintain the integrity of quality affecting data. See paragraph 4.1.1d for generic guidance.

Responsibility: Cognizant Functional Division Manager

5.4 When the configuration changes, a verification and/or validation process shall demonstrate that the software continues to properly perform the Quality Affecting Activities specified in the software requirements documentation and the software design documentation.

Responsibility: System Sponsor

6.0 Use of Quality Affecting Software

6.1 Methods and procedures shall be developed and used to create and maintain a list of Quality Affecting Software.

Responsibility: Cognizant Functional Division Manager

6.2 Methods and procedures shall be developed and used to ensure that the appropriate approved versions of software are used.

Responsibility: Cognizant Functional Division Manager

7.0 Problem Reporting and Corrective Action

7.1 Methods and procedures shall be in accordance with the requirements of Section 1-F of this manual. These methods shall provide for the identification of errors in Quality Affecting Software, and for the implementation of actions to correct the errors.

Responsibility: System Sponsor (Correction of Errors)
Cognizant Functional Division Manager
(Development of Methods & Procedures)

8.0 Data/System Recoverability

8.1 Methods and procedures shall be developed to ensure restoration of the system to a prior condition. An alternate means of performing the Quality Affecting Activity should be established.

Responsibility: Cognizant Functional Division Manager

9.0 Access Control

9.1 Controls shall be established to permit authorized and prevent unauthorized access to a computer system, source code or database.

Responsibility: Cognizant Functional Division Manager

10.0 Procurement

10.1 Software or software services procured to perform Quality Affecting Activities shall be purchased in accordance with the requirements of Section 3-A of this manual. | D

10.2 All quality affecting software applications must have verification and/or validation performed and user documentation developed either by a qualified supplier or by SCE. When SCE performs the application verification and/or validation testing and develops the user documentation, with no reliance on the supplier's program or product certification, the software may be procured as non-quality affecting (no procurement level). | R

| D

11.0 Software Developed Without the Use of Chapter 1-J | D

Any quality affecting software purchased from a non-qualified supplier which was not subjected to the controls stated in Section 10.0 shall be developed and designed in accordance with Section 4.1 and 4.2 and verified and validated in accordance with Section 4.4. | R

Responsibility: System Sponsor | D

12.0 Quality Assurance Records

12.1 The development, procurement, and modification of Quality Affecting Software shall be documented according to the requirements of Paragraph 4.0.

Responsibility: Cognizant Functional Division Manager

12.2 Quality Assurance records shall be maintained as required by Section 1-D of this manual.

Responsibility: System Sponsor; Corporate Documentation Services (CDS) Manager; Manager of Budgets and Administration

13.0 Training

13.1 Personnel using Quality Affecting Software controlled by Section (1-J) of this manual shall be trained on that software in accordance with Section 1-H of this manual.

Responsibility: Cognizant Functional Division Manager

14.0 Audits

14.1 Audits of activities described in this section shall be conducted in accordance with Section 1-E of this manual.

Responsibility: Manager of Nuclear Oversight

ENCLOSURE 15

UFSAR SECTION REFERENCES

UFSAR Section that are relied upon in the J-SPA-289 Analysis

The J-SPA-289 analysis relies directly on the following accidents from Chapter 15 of San Onofre Nuclear Generating Station Units 2 & 3, Updated Final Safety Analysis Report, Revision 12.

1 UFSAR Ref. 15.1.2.3: Increase in Main Steam Flow with a Concurrent Single Failure of an Active Component Accident

2. UFSAR Ref. 15.1.2.4: Inadvertent Opening of a Steam Generator Atmospheric Dump Valve with a Concurrent Single Failure of Active Component Accident

3. UFSAR Ref. 15.2.3.1: Feedwater System Pipe Break Accident

4. UFSAR Ref. 15.4.3.2: Control Element Assembly (CEA) Ejection Accident

5. UFSAR Ref. 15.6.3.1: Primary Sample or Instrument Line Break

6. UFSAR Ref. 15.6.3 3: Loss-of-Coolant Accident (LOCA)

7. UFSAR Ref. 15.7.3.4: Design Basis Fuel Handling Accident Inside Fuel Building

8. UFSAR Ref. 15.7.3.6: Spent Fuel Pool Gate Drop Accident

9. UFSAR Ref. 15.7.3.8: Spent Fuel Pool Boiling Accident

10. UFSAR Ref. 15.7.3.9: Design Basis Fuel Handling Accident Inside Containment

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3. UFSAR Ref. 15.2.3.1: Feedwater System Pipe Break Accident

4. UFSAR Ref. 15.4.3.2: Control Element Assembly (CEA) Ejection Accident

5 UFSAR Ref. 15.6.3.1: Primary Sample or Instrument Line Break

6. UFSAR Ref. 15.6.3.3: Loss-of-Coolant Accident (LOCA)

7. UFSAR Ref. 15.7.3.4: Design Basis Fuel Handling Accident Inside Fuel Building

8. UFSAR Ref. 15.7.3.6: Spent Fuel Pool Gate Drop Accident

9. UFSAR Ref. 15.7.3.8: Spent Fuel Pool Boiling Accident

10. UFSAR Ref. 15.7.3.9: Design Basis Fuel Handling Accident Inside Containment