

1993 DBD

PROGRAM PLAN

Design Bases Documentation (DBD) and Reconstitution Program

San Onofre Nuclear Generating Station (SONGS)
Units 2 and 3

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SCE'S DESIGN BASES DOCUMENTATION & RECONSTITUTION - PROGRAM PLAN

TABLE OF CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
I.	INTRODUCTION	1
II.	DBD PHILOSOPHY AND MISSION STATEMENT	3
III.	OBJECTIVES	4
IV.	SUB-OBJECTIVES	4
V.	SCOPE	5
VI.	VALIDATION	6
VII.	OPEN ITEMS	7
VIII.	IMPLEMENTATION PROCEDURES AND REVIEWS	8
	Graphical 1993 DBD Production Schedule	12
IX.	DBD REFERENCE DATA RETRIEVAL	13
X.	DBD ORIENTATION TO SCE NUCLEAR MANAGEMENT AND TECH STAFF	14
XI.	ASSESSMENTS	15

APPENDIX A - DBD Preparation Schedule Process

APPENDIX B - DBD Program Plan Related Definitions

APPENDIX C - DBD Program Guideline Listing of Reference Sources and DBD FORMAT

SCE'S DESIGN BASES DOCUMENTATION & RECONSTITUTION - PROGRAM PLAN

The major difference in this Revision 7:

- o Re-assessment: To implement supporting engineering improvement and design reconstitution projects, including resolution of Design Bases Documentation (DBD) Open Item Reports (OIRs), and to complete the DBD reports for higher priority plant systems, 19 Design Bases Documents (DBDs) as listed in the previous Program Plan revisions were removed from the current DBD Program scope. Appendix A, herein, provides a current comparison to the 1992 DBD Program Plan sent to the NRC on March 26, 1992.

I. INTRODUCTION

Southern California Edison's (SCE's) San Onofre Design Bases Documentation and Reconstitution Plan outlines the in process program to retrieve, reconstruct, confirm, and document San Onofre Nuclear Generating Station's nuclear power plant design bases in a series of Design Bases Documents (DBDs). The program establishes and documents the rationale or "whys" for the design bases.

NRC activity in this area has included a variety of inspections and surveys, e.g., NUREG-1397. An issue that has been identified as a result of these activities is a potential lack of retrievability and accessibility of design documents.

The NRC has determined that there have been instances where "modifications have been made without sufficient engineering basis and have compromised safety system functionality." Per the NRC, "missing or unretrievable design documentation appears to be a root cause of these problems."* Also, NUMARC 90-12, Design Basis Program Guidelines, notes that many design documents for a plant may be stored without an easy means of retrieval, and urges that utilities consider indexing such documents.

In large, complex and interactive designs such as commercial nuclear facilities, a minor alteration could result in the degradation of system performance in the long or short term which may reduce the margins of safety beyond the approved design envelope.

The DBD development process systematically establishes meaningful plant design bases and ensures prompt access to associated documents. Access to DBDs facilitates the efficiency and quality of plant changes and associated safety evaluations. The DBD Program improves the SCE technical staff's design bases understanding.

* Quotations taken from a slide presented by Brian K. Grimes, Director, Division of Reactor Inspection and Safeguards, presented at the NRC Regulatory Information Conference, Washington D. C., May 1-2, 1990.

The program documents the original bases of the design for consistency and comparison with existing design details and as-built, as-operated, as-maintained information. Such data is accessible to SCE's operating, maintenance, oversight groups, and engineering-technical staffs.

The SCE DBD Program documents detail design bases information that reflects plant design at the time of the operating license issuance with subsequent design bases modifications incorporated. Development of the DBDs results in a significant data base of essential design bases information being established and verified.

The SCE DBD Program Plan is a living document throughout the DBD preparation program. Lessons learned are incorporated. Industry DBD efforts are reviewed for applicability to SONGS. SCE's DBD Program conforms to or exceeds development guidelines contained in:

- o The SCE Independent Assessment of the Engineering and Technical Support to San Onofre Nuclear Generating Station, Three (3) Volume Report, August 1988
- o Region V Utilities - Guidelines for the Establishment of Design Bases Documentation Programs, May 19, 1989. Reference: John B. Martin, Regional Administrator Region V NRC, presentation at the April 18-20, 1989 NRC Regulatory Information Conference, Washington D.C.
- o NUMARC Design Basis Issues (DBI) - Design Basis Program Guidelines, NUMARC 90-12, October 1990
- o NUREG-1397 - An Assessment of Design Control Practices and Design Reconstitution Programs in the Nuclear Power Industry, February 1991. Refer to Section XI herein, Self-Assessment to NUREG-1397

And SCE's DBD Program is applicable to provisions provided in:

- o Federal Register, FR Doc. 92-3804 February 18, 1992; 10 CFR Part 2 Policy and Procedures for Enforcement Actions; Policy Statement, VII. Exercise of Discretion, B. Mitigation of Enforcement Sanctions, 4. "...The NRC may refrain from proposing a civil penalty for a Severity Level II or III violation involving a past problem...(a)...as a result of a licensee's voluntary formal initiative, such as...Design Reconstitution Program...In addition, the NRC may refrain from issuing a Notice of Violation for cases that meet the above criteria provided..."
- o Federal Register, FR Doc. 93-6676 March 24, 1993, "Notice of opportunity for public comment" and FR Doc. 92-18895 August 10, 1992; 10 CFR Part 50, "Availability and Adequacy of Design Bases Information at Nuclear Power Plants; Policy Statement"... (1) Staff will issue a generic letter...design information is correct, accessible, and maintained current. ... (2)...prioritize NRC inspections...based upon response to the generic letter ... (3)...[SALP] process will be modified to reflect...control of design bases information... (4)...encourage self-identification of design bases...enforcement policy." (Refer to previous bullet for potential reduced enforcement action for design bases issues).

II. DBD PHILOSOPHY And MISSION STATEMENTS

SCE is dedicated to the highest standard of excellence in all aspects of operation of the San Onofre Nuclear Generating Station. In order to maintain this standard, SCE is committed to the development and maintenance of a Design Bases Reconstitution and Documentation program.

The development of Design Bases Documents and reconstitution of selected design documents is an extremely important issue in the industry and of particular interest to the NRC.

SCE has adopted a comprehensive DBD program, requiring verification of the accuracy of the design bases before compiling the DBD. Presently and upon completion, the DBD program:

- o Increases the understanding of the design bases and of the importance of various activities in continued compliance with the design bases
- o Improves the consistency between the physical plant configuration and the plant design bases
- o Improves identification and correction of past shortcomings in configuration control/management
- o Assures responsible organizations have ready access to design bases requirements and design bases affected/confirmed by their programs
- o Enhances the quality of engineering and technical support

The development of DBDs is assigned to one organization; however, the responsibility for maintaining SONGS within its design bases resides with each individual in the Nuclear Organization. Personnel procedurally contact NE&C when necessary to confirm that procedural guidance and activities do not, or could not, place SONGS outside of its design bases. The following 1989 DBD Mission has not changed.

"The Primary Mission of the DBD Section is to Effectively Manage the Preparation and Efficient Dissemination of DBD Reports, that:

- o establish and document the rationale or 'whys' for the design bases in an accurate, consistent, and useful form,
- o include existing and select reconstituted design bases,
- o distinguish between design bases and design details,
- o provide technical answers regarding the original and modified system/equipment design, and
- o facilitate quality design, informed technical activities, and configuration management."

III. OBJECTIVES

The DBDs support a variety of engineering, licensing, and plant activities such as operations, maintenance, and site technical. Without a clear sense of the objectives that the DBDs are developed to achieve, the program could produce documents of minimal value to the intended users. Thus, it was imperative that objectives be identified as an initial step in the program. As DBDs are developed, they are evaluated against the following program objectives:

- A) Consolidate basic design bases information into a single source document, system or topical DBDs, which communicate basic design bases, including reference to sources;
- B) Preserve corporate memory and understanding of the underlying technical rationale for the original plant design and subsequent design changes. Minimize the effect of normal attrition of key individuals within SCE, the NSSS Supplier, and other key contractor personnel;
- C) Enhance the quality of design changes through improved accuracy, accessibility, definition, and understanding of the design basis;
- D) Provide controlled design bases information to organizations who must follow design requirements in fulfilling their responsibilities;
- E) Provide condensed technical information used to improve the quality of safety evaluations of plant changes and improve the process and thoroughness of 10 CFR 50.59 evaluations;
- F) Provide a documented reference to support operability evaluations and the development of justifications for continued operation (JCOs); and
- G) Provide a documented reference to support the review of Technical Specifications changes.

The above listed objectives are certainly not inclusive. They are targeted at the engineering and licensing areas as the primary beneficiaries of DBDs. There are many other plant activities that benefit from the design bases program. For example, documentation management aspects are improved as a result of the preparation and related configuration control of the plant systems and topical DBDs.

IV. SUB-OBJECTIVES, Data Management

It is necessary to maintain DBD data in a form that is usable, current and accurate. Objectives in this area are to:

- o Document and address design database omissions;
- o Assure that appropriate information is incorporated, and that the documentation is current, and;
- o Provide a reference-index to lower tier design database documents, to enhance retrievability by key users.

V. SCOPE

The scope of this program is provided in the schedule of plant systems and topical areas listed in Appendix A. The schedule includes systems with safety related functions, systems considered important to plant safety, and select non-safety related systems as listed in Appendix A herein. DBDs are developed for the higher priority systems.

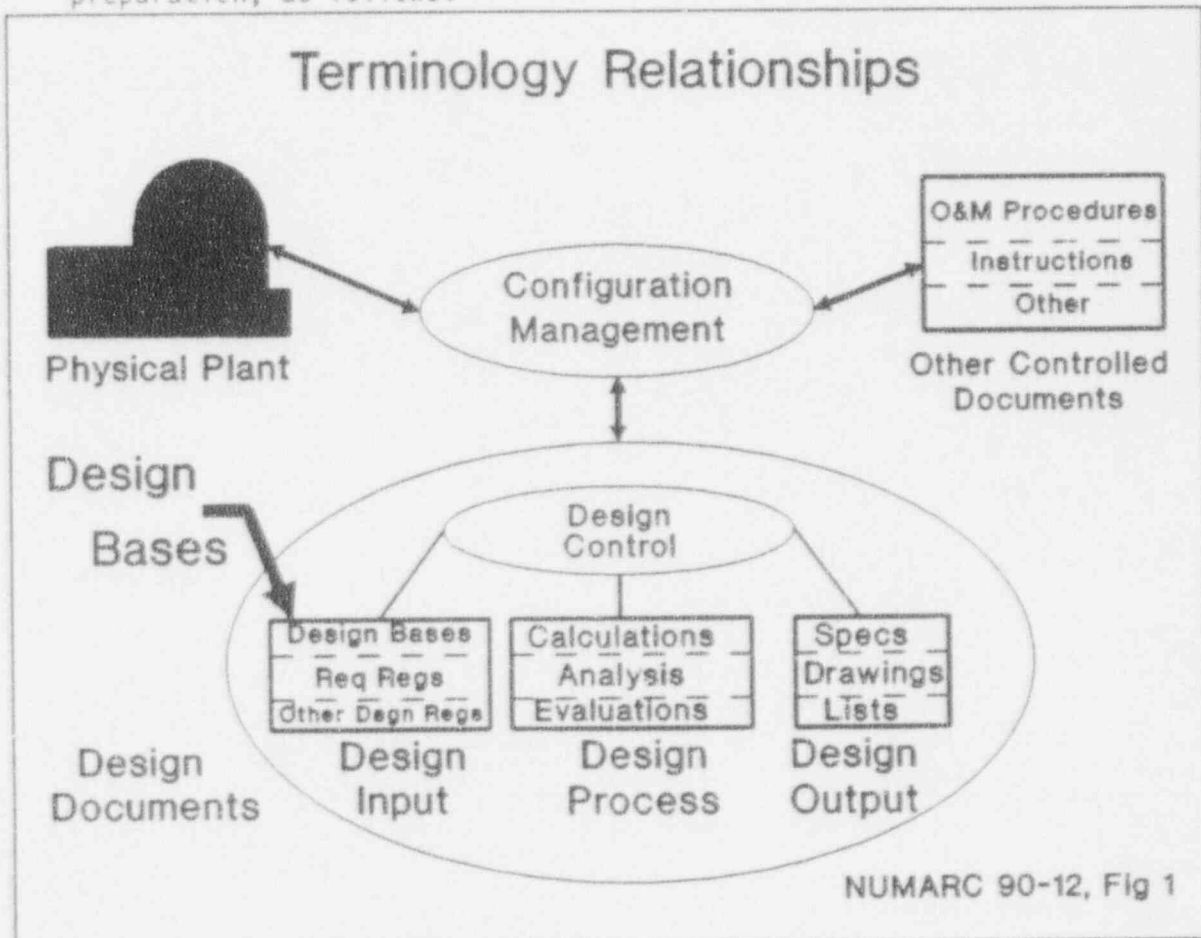
The DBDs are structured on a "mixed approach," which includes descriptive text plus appropriate document referencing. The mixed approach includes texts of:

- o design bases
- o supporting design information
- o component descriptions,

with references to:

- o calculations
- o specifications
- o regulations
- o codes and standards
- o other documents

Typical source and reference documents, having relationship to DBDs and Configuration Management, are depicted graphically to aid in DBD preparation, as follows:



In general, the contents of self-contained documents are not duplicated in the DBD. Rather these documents are incorporated by reference, when applicable. Examples of self-contained documents include:

- o ASME Code Stress Reports
- o Equipment Qualification Data Packages
- o Vendor Manuals
- o Operations and Maintenance Procedures
- o Industry Codes and Standards
- o Specifications
- o Design Changes, Calculations
- o Design Detail Drawings

VI. VALIDATION

Select DBDs are validated through a process intended to provide reasonable assurance that the DBD is complete, accurate and consistent with the existing as-designed, as-licensed, as-built, as-operated, as-maintained configuration of the plant.

The objectives of the validation process are to:

1. Provide reasonable assurance that the information included in the DBD is consistent with the plant's design and configuration;
2. Identify programmatic deficiencies or systematic errors occurring in the preparation of DBDs and recommend corrective action; and
3. Apply lessons-learned.

Specifically, the DBD Program attempts to:

- o Clarify key design bases parameters for the systems and major components. The program will do this for Units 2 & 3 plant systems listed in Appendix A, and major component operating mode.
- o Provide special attention for vendor supplied subsystems (e.g., skid mounted equipment).
- o Verify key engineering parameters used to determine system and component operability are incorporated into operations and maintenance procedures (maintenance procedures principally means those involved with surveillance).
- o Verify that operational and maintenance parameters used to demonstrate system and component operability have been properly derived from the design bases.
- o Verify the post-installation testing program for system and/or components meets these parameters, following design modification activities.

The scope of the validation process may vary from a selective educated sample to a more comprehensive validation of the information, as warranted. The scope will be prescribed by several factors including importance to safety of the system components, history of past problems, complexity, size, etc.

The DBD Program validation technique elements are:

1. Walk-downs performed by the DBD Engineer (DBD preparer) during the preparation of the document;
2. Supervisory review of the document throughout the DBD preparation stages, in addition to the documented evaluation by an Independent Review Engineer (IRE); and
3. An interdisciplinary review performed by cognizant technical staff from Nuclear Engineering, Nuclear Licensing, Station Technical and other sections of the Nuclear Organization, independent of the DBD Section. A vertical assessment (SSFI type inspection/audit) of select areas by an independent group specially dedicated to this task may be used as a supplement to the validation process. The selection of the appropriate method, dependent on the DBD System, is made by DBD Management on a case by case basis. The vertical assessments consist of a review, on an educated sampling basis, of the adequacy, completeness, and consistency of the material presented in the DBD package.

VII. OPEN ITEMS

A process is in place to effectively manage and track the resolution of DBD open items identified during the implementation of the DBD program. The fundamental purposes of the Open Item Report (OIR) Process are:

1. To act as a mechanism for establishing the correctness of the design bases of a system where questions, concerns, lack of information, or errors exist.
2. To provide a thorough, comprehensive process that will adequately assess the impact of open items on the continued safe operation of the plant.

The type of issues which have arisen or can be expected, and are addressed in the OIR Procedure, include:

- o Operability Issue
- o Reportability Issue
- o Nonconforming Issue
- o Licensing Issue
- o Design Bases Issue
- o Tracking (follow-up administrative item)

OIR procedure S0123-XXXV-5.1 addresses semi-annual trending of open items to identify generic design bases or documentation issues.

Following the identification of a potential OIR issue, a screening review is performed to quickly determine its potential safety significance. If the identified open item does not involve a safety concern, the OIR will continue to be evaluated and dispositioned and will be subject to supplemental review during the final evaluation. If the OIR issue is determined to be potentially safety significant, then the Non-Conformance Report (NCR) process is initiated. At OIR initiation, an initial operability and reportability assessment is performed as part of the OIR documentation.

In accordance with the SCE Topical Quality Assurance Manual (TQAM), safety significant discrepancies are reviewed for inclusion in SCE's NCR Program. DBD open items are:

- o Assessed for reportability as required by 10 CFR 50;
- o And assessed for impact on operability.

NCRs and OIRs that affect the DBD content or conclusions are listed in each DBD at issuance.

The OIR procedure (S0123-XXXV-5.1) includes an OIR priority system. The OIRs and the DBDs are linked together on a priority basis to ensure that the disposition and resolution of the OIRs are incorporated into the DBDs.

SCE, as part of the NUMARC Design Basis Issues (DBI) Working Group, reviewed the NUMARC Design Basis Program Guidelines with special attention to open items to ensure that SCE's program is consistent with or exceeds the generic guidelines.

Strengths identified in the Nuclear Oversight Report SEA-92-001, dated March 20, 1992, were: "The assessment concluded that the OIR system was generally being implemented in a manner consistent with procedure requirements and was effective in identifying probing questions concerning the plant design bases. Personnel assigned to the DBD Program are performing rigorous reviews as evidenced by the type and nature of the problems being entered into the OIR system."

VIII. IMPLEMENTATION PROCEDURES AND REVIEWS

A. Program Procedures

The Procedures governing the DBD Program activities are developed in compliance with the SCE Quality Assurance Program. The DBD Program is addressed in the TQAM in Chapter 2-A, Design Development, Review and Approval, Sections 1.0 and 3.0.

The DBD Program includes development of a system of procedures and guides to control the production of the DBD packages, namely:

- Procedures for the preparation of DBDs
- Procedures for the administration of DBDs
- Desk-top Guides

Procedures for the Preparation of DBDs: All DBD Nuclear Organization Quality Procedures are available.

- S0123-XXXV-1.1 Guidelines for System DBD Preparation
- S0123-XXXV-1.2 Calculation Review Methodology
- S0123-XXXV-1.3 Setpoint Review Methodology
- S0123-XXXV-1.4 Margin/Uncertainty Assessment
- S0123-XXXV-1.5 System Functional and Boundary Definition Methodology
- S0123-XXXV-1.6 Plant Operating Instructions Review Methodology
- S0123-XXXV-1.7 Motor Operated Valve Review Methodology
- S0123-XXXV-1.8 Technical Specification Review Methodology
- S0123-XXXV-1.9 Licensing Basis and Commitments Review Methodology
- S0123-XXXV-1.10 Electrical Interlock Functional Testing and Review Methodology
- S0123-XXXV-1.12 Verifying the Environmental Qualification Master List
- S0123-XXXV-1.13 Inservice Testing Review Methodology
- S0123-XXXV-1.14 Post Modification Testing Review Methodology
- S0123-XXXV-1.15 Spurious Circuit Actuation Evaluation
- S0123-XXXV-2.1 Guidelines for Topical DBD Preparation

Procedures for the Control of DBDs:

- S0123-XXXV-5.1 Design Bases Documentation Open Item Report (OIR)
- S0123-XXXV-5.2 Design Bases Documentation (DBD) Responsibility Turnover.
- S0123-XXXV-5.5 Validation, Approval, and Issue of Design Bases Documents
- S0123-XXIV-10.17 This NEDO Quality Procedure that controls other San Onofre design disclosure documents was modified in May 1991 to address the "Revision, Maintenance, and Control of DBDs."

Desk-top Guides:

- | | |
|-------------------|---|
| DBD-1 | DBD Program Plan (This Document) |
| DBD-1A | DBD Commitments List |
| DBD-3 | DBD Writer and Text Processor Guide |
| DBD-5 | Standard For DBD Simplified Drawings/Diagrams |
| DBD-9 | Ultimate Heat Sink Operability Review Methodology (DBD Guidance related to NRC Generic Letter 89-13, Service Water Systems Licensing Bases Review) |
| DBD-11 | DBD Glossary and Abbreviations |
| Topical
Scopes | 11 Topical DBD Scoping Documents issued.
Refer to Appendix A herein of list of Topical DBDs. |
| General | Miscellaneous desk top guides, in 1993 DBD Manual, such as: |
| | <ul style="list-style-type: none">o Current Program Plan, DBD Production status, and OIR Trendso Regulatory DBD History and Guidanceo Self-assessments, e.g., NUREG 1397 comparisono Topical DBD Scoping documentso Training Requirements and DBD Orientation informationo Check list of the sources of design bases reference materials and corresponding electronic data retrieval systems, including document retrieval User-Guideso System DBD Cross Index of pertinent informationo Boiler plate information regarding automatic electronic DBD formattingo Clarification Guidance to DBD Engineers on Procedure Reviews |

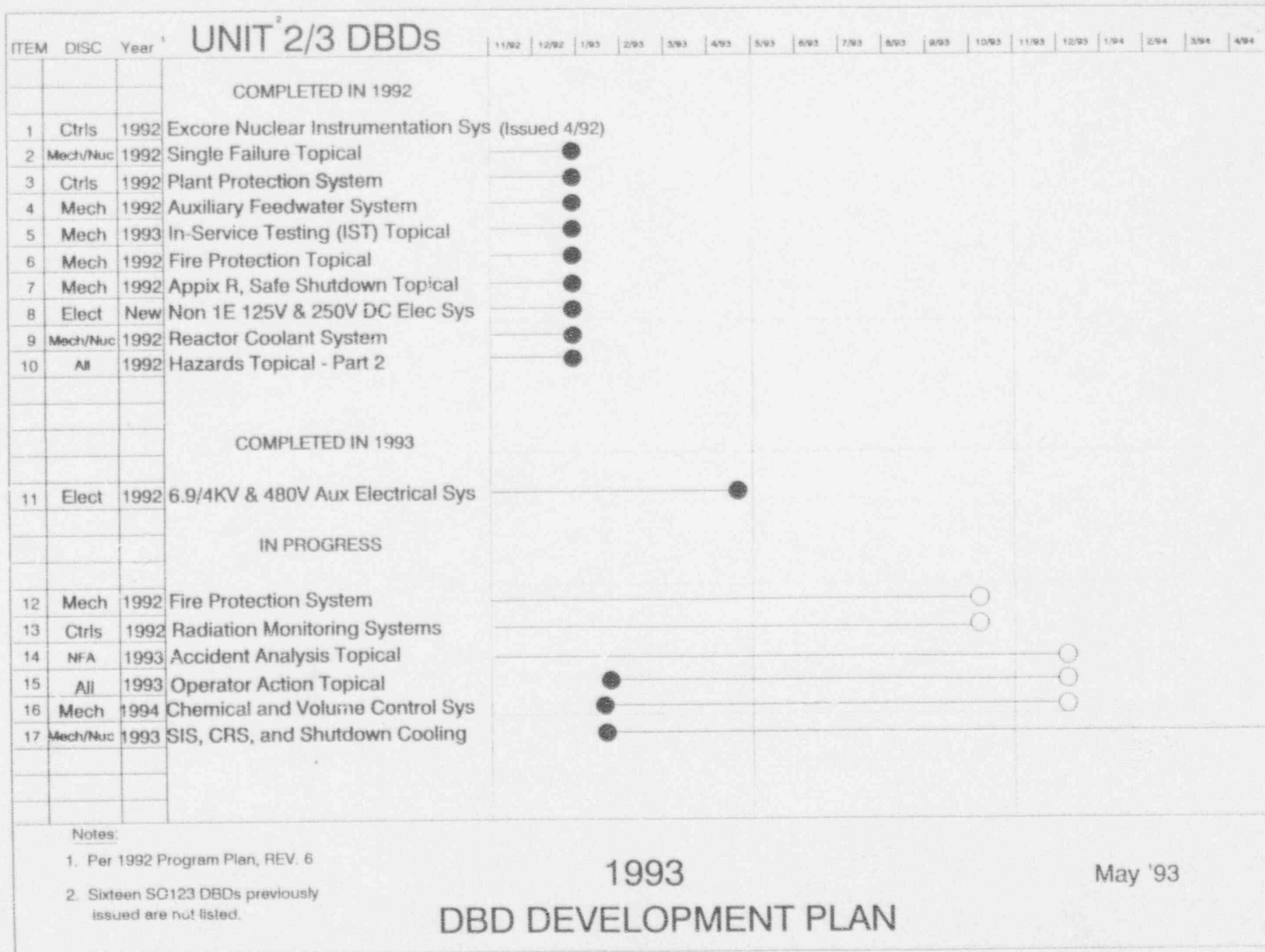
B. DBD Reviews, Milestones

- o At the 10%, 50%, and 90% DBD development milestones, DBD Management Staff reviews are held.

<u>MILESTONE(%)</u>	<u>DBD REVISION</u>	<u>DEFINITION</u>
NA	NA	o Initial reference data retrieved and System Design Engineer (SDE) on-board
10 %	NA	<ul style="list-style-type: none"> o System/Topical functions defined o System/Topical interfaces established o System/Topical boundaries (DBD Scope) established o Note: Confirmation of resource and documentation adequacy is first reviewed at the 10% Milestone and monitored throughout DBD preparation.
50 %	NA	<ul style="list-style-type: none"> o Draft DBD completed o Open items identified o Supervisory review complete o Plan Validation
90 %	A	<ul style="list-style-type: none"> o Validation Implementation o Interdisciplinary review o Final supervisory review
100 %	0	<ul style="list-style-type: none"> o All comments resolved and incorporated o DBD complete, CDM issues DBD, and start of "turnover" of DBD ownership to Nuclear Engineering Design Organization (NEDO) or Nuclear Fuel Management (NFM).

C. Graphical Schedule -

See next page for 1993 Target DBD Implementation. For pre-1992 issued DBDs, refer to Attachment A.



IX. DBD REFERENCE DATA RETRIEVAL

A. Reference Sources:

In addition to record retrieval from SCE's Corporate Document Management (CDM) system, it is necessary to retrieve select data records from three primary sources, namely:

- o Combustion Engineering (C-E), SONGS Unit 2/3 Nuclear Steam Supply System (NSSS) Vendor
- o Bechtel Power Corporation (BPC), SONGS 1, 2 and 3 Architect Engineer (AE)
- o Westinghouse SONGS Unit 1, DBD data retrieval ceased in 1991

The C-E data retrieval effort was part of a joint effort of the C-E Owners Group (CEOG) Configuration Management Task Force (CMTF). The C-E CMTF systematic approach effort was completed in 1990. The product includes a value added index of over 23,000 documents with over 17,000 San Onofre related documents containing an estimated 350,000 pages of calculations, analyses, studies, evaluations, and correspondence.

The product options included optical disk transfer of the index and image of the 350,000 pages. SCE elected to select the optical disk option for ultimate integration into existing SCE Network computer applications beyond the near term DBD preparation effort. The C-E FileNet optical image system became an integral part of the DBD Library beginning in mid-1990. In addition, the C-E database index has been combined with four other related SCE databases for over 80,000 document indices available on the mainframe-host called Nuclear Document Reference System (NDRS). To increase data research efficiency, a single search inquiry of NDRS, by any Nuclear Group user, results in retrieval of pertinent indices data from multiple data bases. DBD Configuration Management Staff provides NDRS User-Guides and assistance to new users as part of DBD Orientation. Refer to the next Section for other aspects of DBD Orientation.

B. Computer Assistance and Control Aspects:

As the design authority, the design engineering organization has the primary responsibility to ensure changes are properly reviewed, verified, and approved.

Similarly, changes to DBDs often affect other documents and analyses. To assist in identifying affected documents and analyses, a Design Bases Reference Source Guide of about 35 computer-based reference sources was developed.

The Rev-0 DBDs are entered into two (2) connected computerized SCE Network applications, namely:

- o Text-Search of SONGS Documents (TextWare) contained in the IOC Network Library of the Nuclear Retrieval Data System and at the Site. TextWare allows section index searches, key-word and phrase searches and text viewing. Text-Search normally contains text only. Note: The DBD Program Plan and DBDs text are available in TextWare in addition to SONGS CDM File. Note: TextWare is being replaced by an enhanced integrated Local Area Network (LAN) System, TOPIC.
- o San Onofre Document Management System (SDMS). SDMS is an optical image of the entire document including signature approvals and all tables and figures. Optical image systems do not presently contain word search features. All issued DBDs and DBD Nuclear Organization Quality Procedures are available on SDMS in addition to TextWare or TOPIC.

The combination of Text-Search and SDMS affords flexibility in the access of DBD packages. Text-Search and SDMS are linked between Nuclear Engineering, Safety, and Licensing (NES&L) in Irvine and the SONGS Site. DBD revisions are controlled via a single input to SDMS that automatically updates the Text-Search application. Hard copy of the DBD packages are also issued to select controlled locations at the IOC and Site.

The original DBD packages are filed in Technical Services-Drawing Control at the Irvine Office and indexed in Corporate Documentation Management (CDM)-SCE Document Configuration System (SDCS) as a design disclosure, revision controlled document.

Additional computerization nearing completion, for the DBD effort includes:

- o "Value-added" indexing and integration of existing computer databases for retrieval of select engineering and licensing documentation, applicable for expansion to optical imaging.
- o Computerization of engineering and licensing documents on a hierarchy reference basis.

X. DBD Orientation to Nuclear Management and Technical Staff

- A. The DBD Program scope includes individual orientation sessions with Nuclear Organization Managers and Supervision. The DBD Orientations are tailored to the match the particular manager responsibility and interest.

For example, plant operating aspects of the DBD products was the primary focus during the meeting with Operations Management. DBD spin-off benefits related to Operations were addressed, such as DBD preparation procedures:

- SO123-XXXV-1.6: Plant Operating Instruction Review Methodology
- SO123-XXXV-1.7: Motor Operated Valve Review Methodology
- SO123-XXXV-1.8: Technical Specification Review Methodology
- SO123-XXXV-1.10: Electrical Interlock Functional Testing Review Methodology
- SO123-XXXV-1.14: Post-Modification Testing and Review Methodology
- SO123-XXXV-1.15: Spurious Circuit Actuation Evaluation

DBD Orientation was provided to nearly 180 attendees at the Mid 1992 Management/Supervision Training, five sessions with an average of 36 managers and supervisors per session.

- B. DBD-For-Users, a five (5) hour training session to Lesson Plan D30001, was conducted 10 times since October 1991. The sessions were attended by both NES&L and NGS technical staff, with average class sizes of 17 individuals per session, total of 170 technical staff attended. The DBD Orientations to the Nuclear Organization managers, supervision, and technical staff are in addition to the DBD procedural requirement and policy to involve key Nuclear Organization designated representatives in the 10%, 50%, and 90% DBD Milestone input and working meetings.

XI. ASSESSMENTS

Internal and external assessments of the DBD Program and DBD Production implementation process periodically occur.

The SCE Design Bases Documentation Program Plan is routinely updated. As DBD activities progress, pertinent information, direction, and insights from lessons learned have and will be incorporated into the Program Plan updates. The initial DBD Program Plan was sent to the NRC Region V on January 9, 1989; Revision 5 was sent on March 11, 1991; and Revision 6 on March 26, 1992. The NRC Region V Resident Inspectors' Office has received all annual DBD Program Plan updates.

SCE Nuclear Oversight Division (NOD) performed assessments of DBD program elements in January 1991 and February 1992. INPO reviewed the DBD Program during their April 1991 visit. A review meeting was held with NRC Region V Reactor Safety Branch Chief in September of 1991 at SONGS. At a May 1, 1992 Region V Headquarters meeting, the DBD progress was reviewed. On January 15, 1993, SCE and Region V NRC Management met at SONGS, DBD status was on the agenda for discussion.

The October 1991 NRC Systemic Assessment of Licensee Performance (SALP) Report acknowledged the DBD analysis activities. Specifically, in Section-F, Engineering/Technical Support, 1. Analysis: "...the licensee appeared to have successfully implemented past recommendations by continuing to aggressively pursue engineering program enhancements, such as the design basis update and technical sufficiency improvements."

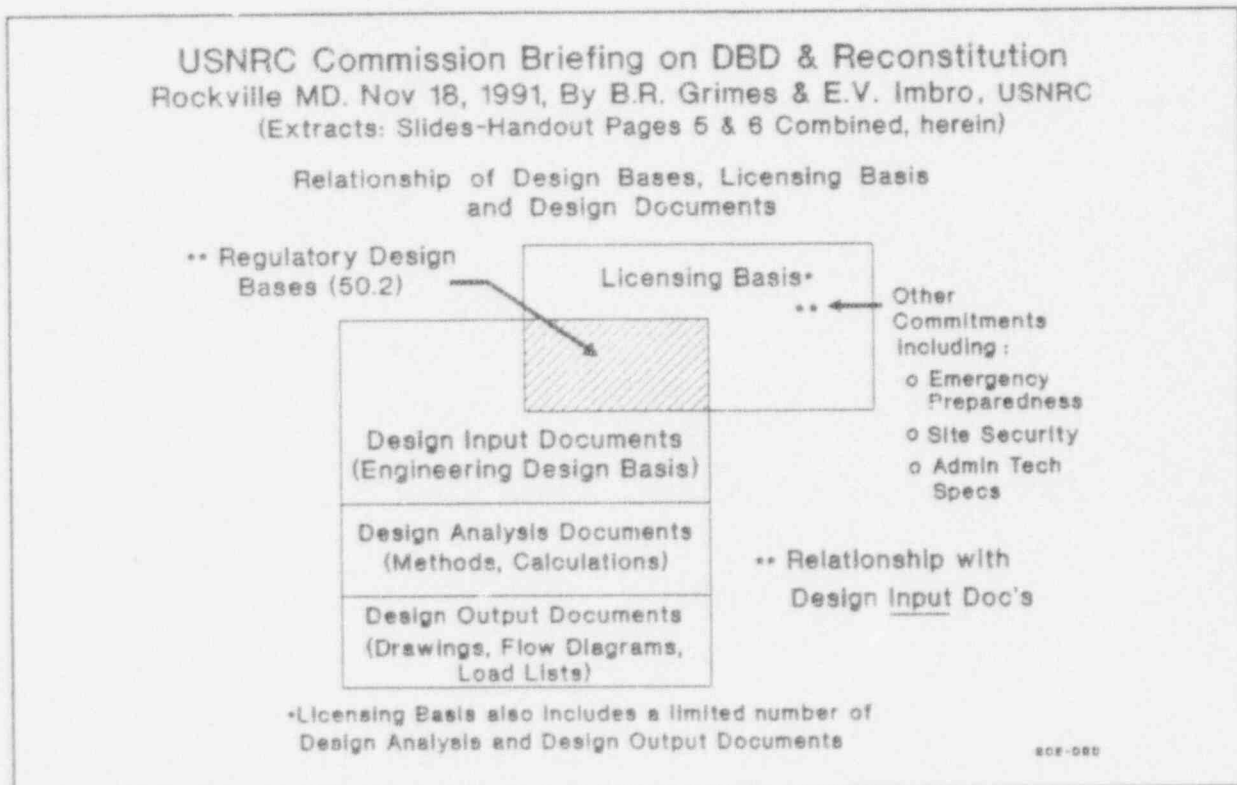
The December 24, 1992 SALP, Section F, Engineering/Technical Support, states in part "...detailed analyses of the plant, such as a design basis reconstitution, identified several significant problems including a potential environmental hazard to several auxiliary feedwater valves in Units 2 and 3."

Routine self assessments are a part of the DBD Program, including a comparison to NUREG-1397, "An Assessment of Design Control Practices and Design Reconstitution Programs in the Nuclear Industry," dated February 1991. DBD's 40 page self assessment document, updated June 1992, compares 50 pertinent paragraph sections from NUREG 1397 regarding key attributes for an effective Design Bases/Reconstitution Programs. The NUREG-1397 self assessment document is maintained as material in the DBD Manual and is part of DBD Orientation interface activities .

In conjunction with SCE's self-assessment against guidance contained in NUREG-1397, reviews are routinely conducted on related regulatory information and guidance, such as:

- o SECY-91-364, "Design Document Reconstitution", SECY-92-193 "Design Bases Reconstitution", November 12, 1991;
- o Generic Letter 92-03, "Compilation of the Current Licensing Basis, Request for Voluntary Participation in Pilot Program," March 19, 1992. (Reference: SCE volunteer letter from H.B. Ray to NRC, dated March 28, 1992); and
- o Federal Register, August 10, 1992, "Availability and Adequacy of Design Bases Information at Nuclear Power Plants; Policy Statement."

As part of the continuing review of design bases/reconstitution initiatives and regulatory guidance, the following graphic illustrates guidance used during the priority-selection process for the 1993-94 DBD development.



For supporting information to the 1993 DBD Program Plan and Progress Status, refer to the attached Appendices:

Appendix A - DBD Preparation Schedule

Appendix B - DBD Program Related Definitions

Appendix C - DBD Program Guideline Listing of Reference Sources

APPENDIX A

DBD PREPARATION SCHEDULE PROCESS

A. DBD Preparation Schedule Criteria

The following criteria were used in preparing the attached schedule:

1. The Units 2 and 3 plant systems and topical areas were systemically ranked.
2. Ranking was performed based on:
 - o Importance to plant safety
 - o Historical design issues consideration
 - o Operations and maintenance design bases issues consideration
3. The schedule covers the period 1990-1995, including closure of DBD OIRs.
4. Systems ranked as low priority are not included in the schedule.

Sub-Objectives:

- o Where practical, issue the production DBDs to match the needs of San Onofre;
- o Target DBD completion prior to planned design change activities for particular systems; and
- o Schedule Design Engineering/Station DBD support compatible with unit outages and specific needs.

B. Summary:

Units 2 & 3

Program Plan Revision:

This Revision 7:

Plant System DBDs Scheduled:

15*

Topical DBDs Scheduled:

11

TOTAL SCHEDULED:

26

Notes:

The 15* scheduled System DBDs, involve 96 S023 Start-Up Systems.

Of the 19 DBDs presently listed for removal from the program, others could be added to the total 26 DBDs scheduled above, depending on future emergent needs assessment. See following page -A6- for the list of 19 DBDs presently removed from the program scope.

As a result of the decision to retire San Onofre Unit 1, no other S01-DBDs are planned. However, seven (7) S01-DBDs were issued in 1990/91 on important system and topical areas, pertinent to S01 retirement activities.

C. DBD Completion Status and Schedule Plan

Note: The seven (7) S01 DBDs issued in 1990/91 are not listed, herein.

Nine (9) Units 2 and 3 DBDs were issued in 1991

DESIGN BASES DOCUMENTATION PREPARATION SCHEDULE FOR THE YEAR 1991

<u>START Date</u>	<u>REV. 0</u>	<u>DBD ID DBD # = System Descriptions #</u>	<u>DBD TITLE System Title, or Topical Area</u>	<u>REMARKS</u>
Feb 90	Dec 1991	DBD-S023-TR-HF	Human Factors Topical	Rev-0 Issued
Jan 91	Dec 1991	DBD-S023-TR-EQ	Environmental Qualification Topical	Rev-0 Issued
Apr 91	Dec 1991	DBD-S023-TR-PL	Plant Level Topical	Rev-0 Issued
Feb 91	Dec 1991	DBD-S023-TR-HZ Part 1, see page -A3- herein.	Hazards Topical Internal & External	Rev-0 Issued Missiles & Pipe breaks.
Jun 89	Dec 1991	DBD-S023-400	Component Cooling Water System	Rev-0 Issued
Jan 90	Dec 1991	DBD-S023-410	Salt Water Cooling System	Rev-0 Issued
Apr 90	Dec 1991	DBD-S023-140	1E 125VDC & 250VDC Systems	Rev-0 Issued
Mar 89	Dec 1991	DBD-S023-540 /570	Instrument Air & Backup Nitrogen Systems	Rev-0 Issued
Feb 91	Dec 1991	DBD-S023-800 Part 1, see page -A6- herein.	Emergency Chilled Water Systems	Rev-0 Issued

Ten (10) S023 DBDs, Rev-0 or Rev-1, were issued in 1992

DESIGN BASES DOCUMENTATION PREPARATION SCHEDULE FOR THE YEAR 1992

<u>START Date</u>	<u>REV. 0</u>	<u>DBD ID DBD # = System Descriptions #</u>	<u>DBD TITLE System Title, or Topical Area</u>	<u>REMARKS</u>
May 91	Mar 1992	DBD-S023-470	Excore Nuclear Instrumen- tation System	Rev-0 Issued
Mar 91	4th Qtr 92	DBD-S023-TR-SF	Single Failure Topical	Rev-0 Issued
Feb 91	4th Qtr 92	DBD-S023-710 /720	Plant Protection Systems (PPS), included RPS and ESF Systems	Rev-0 Issued
Feb 90	4th Qtr 92	DBD-S023-780	Auxiliary Feedwater System	Rev-0 Issued
Jan 92	4th Qtr 92	DBD-S023-TR-IS	In-Service Testing (IST) Topical	Rev-0 Issued
Nov 91	4th Qtr 92	DBD-S023-TR-FP	Fire Protection Topical	Rev-0 Issued
Nov 91	4th Qtr 92	DBD-S023-TR-AR	App. R, Safe Shutdown Topical	Rev-0 Issued
Apr 92	4th Qtr 92	DBD-S023-145	Non 1E 125V & 250V DC Systems	Rev-0 Issued
May 91	4th Qtr 92	DBD-S023-360	Reactor Coolant System	Rev-0 Issued
Jan 92	4th Qtr 92	DBD-S023-TR-HZ Part 2	Hazards Topical Internal and External, see Part 1 page -A2- herein.	Rev-1 Issued

Six (6) DBDs are scheduled for issuance in 1993.

DESIGN BASES DOCUMENTATION PREPARATION SCHEDULE FOR THE YEAR 1993

<u>START Date</u>	<u>REV. 0</u>	<u>DBD ID DBD # = System Descriptions #</u>	<u>DBD TITLE System Title, or Topical Area</u>	<u>REMARKS</u>
May 91	May 93	DBD-S023-120	6.9KV, 4KV, & 480V Electrical Systems	Rev-0 Issued
Jan 92	June 93	DBD-S023-590	Fire Protection Systems	
May 91	3rd Qtr 93	DBD-S023-690 /700	Radiation Monitoring Systems	
Dec 90	4th Qtr 93	DBD-S023-TR-AA	Accident Analysis Topical	Rev-0 will contain 21 of 58 Events. See page -A6- for Part 2, Rev-1, cancellation
Dec 92	4th Qtr 93	DBD-S023-TR-OA	Operator Actions Topical	E01 deviation and basis, scope
Jan 93	4th Qtr 93	DBD-S023-390	Chemical and Volume Control System	

One (1) DBD, and Project Closeout activities are scheduled for 1994.

DESIGN BASES DOCUMENTATION PREPARATION SCHEDULE FOR THE YEAR 1994

<u>START</u> <u>Date</u>	<u>REV. 0</u>	<u>DBD ID</u> <u>DBD # = System</u> <u>Descriptions #</u>	<u>DBD TITLE</u> <u>System Title, or</u> <u>Topical Area</u>	<u>REMARKS</u>
Jan 91	3rd Qtr 94	DBD-S023-740	Safety Injection Containment Spray and Shutdown Cooling Systems	

The following 19 DBDs are removed from the current DBD program, as discussed in the introduction and as itemized below.

19 DBDs Removed	Justification for Removing DBD:
1. Accident Analysis Topical remaining 37 of 58 Events were planned for a Revision-1.	See (1) below
2. Main Feedwater Systems	(1)
3. Codes and Standards Topical	(1)
4. Emergency Diesel Generators System	EDSF Inspection and subsequent evaluations obviated the need for a DBD.
5. HVAC-Misc. Ventilation Systems	Heat loads covered in DBD-S023-800
6. Containment and Support Systems	10CFR50 Appendix J and Tech Specs provide adequate basis.
7. 120V AC Electrical Systems	DC and 6.9/4KV & 480V Elec System DBDs have been completed. Value of 120 VAC DBD is not sufficient.
8. Main and Reheat Steam Systems	MSIVs, ADVs, and other critical valves are addressed in other DBDs.
9. Piping and Pipe Break Topical	HELB covered in Hazards Topical DBD
10. Accident Monitoring System (Reg Guide 1.97 aspects)	Design basis review covered in R.G. 1.97 Instrumentation Report # 90055
11. CEDM (NSSS Support) System	(1)
12. Coolant/Gas Radwaste Systems	(1)
13. Fuel Handling/Refueling Sys	(1)
14. Incore Nuclear Instrumentation System	(1)
15. Normal Chilled Water System	Non Safety Related System
16. Nuclear Sampling & Post Accident Sampling System	PASS, Non Safety Related System
17. Electrical Separation Topical (Reg Guide 1.75 aspects)	Electrical DBDs have/will address Reg Guide 1.75 to some extent.
18. Seismic Topical	See SCE's IPEEE pending effort in response to G.L. 88-20 .
19. Struct/Structural Sys Topical	(1)

(1) Implement supporting Engineering Reconstitution Improvement Projects and resolution of DBD OIR Issues. Justifications are consistent with IPE.

APPENDIX B

DBD PROGRAM RELATED DEFINITIONS

- B.1 Configuration Management: An integrated process whereby (1) the design requirements for plant structures, systems, components, software, and hardware are defined and documented; (2) changes to these design requirements are identified, documented, controlled, evaluated, and approved or disapproved; (3) approved design changes and implementation status are recorded and reported throughout the life of the plant; and which (4) results in the accurate implementation of design output information into the physical configuration of the plant and (5) into selected plant configuration documents specifying operations, maintenance, testing, installation, procurement, and training requirements.
- B.2 Design Bases: Information which identifies the specific functions to be performed by a structure, system, or component of a facility, and the specific values or ranges of values chosen for controlling parameters as reference bounds for design. The values may be (1) restraints derived from generally accepted "state of the art" practices for achieving functional goals, or (2) requirements derived from analysis (based on calculation and/or experiments) of the effects of a postulated accident for which a structure, system, or component must meet its functional goals. (10 CFR 50.2 Definitions)
- B.3 Design Bases Training Package: A set of documents which are developed for the purpose of training individuals in the design bases area, which include, but is not limited to the following:
- 1) Lesson Plans
 - 2) Handout Materials
 - 3) Examinations
 - 4) Other Material used in Training
- B.4 Design Disclosure Documents: *{Those qualified and controlled}* Drawings, P & I Diagrams, Calculations, Specifications, or Design Bases Documents which define items *{the basis of the plant and other design}* and which are needed to translate engineering concepts into structures, SYSTEMS, and COMPONENTS. [TQAM]
- B.5 Independent Review: A method of verifying process, procedure or task results by a party other than the one conducting the event. The reviewer may or may not be from an external organization.
- B.6 Margin of Safety: The range above the ACCEPTANCE LIMIT reviewed and approved by the NRC as part of the LICENSING BASIS. [10CFR50.46(c)(1)]
Design Margin: The difference between the value of a parameter as determined by test or analysis (i.e., *capability of the component*) and the design basis specific for that parameter. [NUREG-1397]
- B.7 Non-safety Function: For the purposes of the DBD Program, items which are neither SAFETY RELATED nor IMPORTANT TO PLANT SAFETY. [S0123-XXXV-1.1]

B.8 NRC Inspections/Surveys: As a reference, NRC acronyms used within the industry that have relationship with DBD initiatives are:

- o SSFI-Safety System Functional Inspection
- o SSOMI-Safety System Outage Maintenance Inspection
- o EDSFI-Electrical Distribution System Functional Inspection
- o DVI-Design Verification Inspection
- o DET-Diagnostic Engineering Team
- o CLB-Current Licensing Basis

B.9 Open Items: Those items that are discovered during the performance and evaluation of the design bases document that are discrepant and require correction.

B.10 Operable: A system, subsystem, train, COMPONENT, or device is considered OPERABLE when it is capable of performing its specified FUNCTION(S), and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its FUNCTION(S). [NUREG 1397, TS 1.17]

B.11 Safety Functions: *{Those safety actions, operations, or work performed by a SYSTEM, structure, or COMPONENT} during and following DESIGN BASIS EVENTS, {which are} defined as conditions of normal operation, including ANTICIPATED OPERATIONAL OCCURRENCES, DESIGN BASES ACCIDENTS, EXTERNAL EVENTS, and NATURAL PHENOMENA for which the plant must be designed to ensure:*

- 1) The integrity of the REACTOR COOLANT PRESSURE BOUNDARY;
- 2) The capability to shut down the reactor and maintain the safe shutdown condition.
- 3) The capability to prevent or mitigate the consequences of accidents that could result in potential off-site exposures comparable to 10 CFR Part 100 guidelines.
[10CFR50.49(b)(1)]

The term "safety related" applies to the prevention or mitigation of the consequences of postulated accidents that could cause undue risk to the health and safety of the public. Important-to-safety relates to "plant safety."

B.12 Validation: The process of ensuring that the physical plant *{including configuration, operation, and maintenance}*, the design output documents and the design bases documents are consistent. [NUREG 1397]

Note: The above definitions relate to text within this DBD Program Plan. For additional definitions related to DBD Preparation activities, refer to DBD-11, DBD Glossary and Abbreviations.

APPENDIX C

GUIDELINE LISTING OF REFERENCE SOURCES

(Summary comparison of Licensing Bases vice Design Bases reference documents)

- I. Design Disclosure Documents: documentation that provides information and data needed to translate engineering concepts into structures, systems and components, e.g.:

- o Drawings
- o P&I Diagrams
- o Calculations
- o Specifications

Note: An analyses document that "define items...engineering concepts..." may also represent a Design Disclosure Document.

Design Disclosure Documents must be the "documents of record" and so authorized as Design Disclosure Documents. Design Bases Documents (DBDs) for San Onofre are Design Disclosure Documents.

- II. Documentation in addition to Design Disclosure Documents that were used in evaluating technical options, provided clarifying analysis, or provided additional definition during or subsequent to the development and establishment of the Licensing and/or Design Bases of record, e.g.:

- o Safety Analysis Reports (SARs), including Preliminary (PSAR), Final (FSAR), Updated Final (UFSARs), and related documentation such as, NRC SAR Questions and Licensee Answers (SAR-Q&As) [SONGS, Unit-1 was Final Engineering Report and Safety Analysis-FSA, now UFSAR]
- o Fire Hazards Analysis (FHA), Environmental Impact Report (EIR), Emergency Preparedness Plan (EPP), and the Physical Security Plan (PSP) and associated Q&As
- o Safety Evaluation Reports (SERs) prepared by the NRC, including SEP related NRC correspondence and SEP related Licensee prepared analyses and responses
- o Systematic Evaluation Program (SEP) reports and correspondence (Note, SEP's are only applicable to early vintage nuclear facilities, such as SONGS Unit-1, as designated by the NRC)
- o Operating Licenses/Technical Specifications, including previous revisions related to the design bases evolution
- o NRC Regulatory Guides and NRC Reports (NUREGs)

- o Code of Federal Regulations, Title 10 (10 CFR) such as Part 50, (10 CFR 50) Appendix A - Criteria - General Design Criteria, Criterion 1 through 64
- o Codes and Standards such as American Society of Mechanical Engineering ASME Codes and other related codes and standards used in the development of the design bases and/or referenced within the Design Disclosure or Design Bases References Documents
- o NSSS Supplier/Equipment Manufacture/A-E Design Manuals and related design bases of record and associated reference documentation
- o NRC Commitment Correspondence/Documentation: related to the previously listed Design Disclosure and Design Bases Reference Documentation

III. Other reference materials: such as the System Descriptions, normal and emergency procedures and programs, etc., are design/process/program implementing documents that in some cases are integral to DBD development. These documents are not deemed to be Design Disclosure nor Design Bases Reference Documentation. Extractions from these documents will be annotated within the DBD when they are referenced in DBDs to provide clarification or to demonstrate implementation, on a case by case basis.

IV. Refer to S0123-XXXV-1.1 and S0123-XXXV-2.1 Quality Procedures for the detailed list of Source Reference Documentation Categories used by the DBD Section to manage and record DBD reference documentation.

V. DBD FORMAT

Although the DBD Program Procedures provide the specific guidelines for the preparation of the DBDs, the program format elements are addressed below to provide general information on the level of detail and content of the DBDs.

TABLE OF CONTENTS

A. SYSTEM DBD PACKAGE CONTENT FORMAT

The format guidelines, per S0123-XXXV-1.1, for the DBD Packages are as follows:

PREFACE

PURPOSE

0. SUMMARY OF DESIGN BASES INFORMATION

1. SYSTEM OVERVIEW

- 1.1 System Boundaries
- 1.2 System Interfaces
 - 1.2.1 Services Supplied
 - 1.2.2 Support Services Required
- 1.3 Quality Classification and Seismic Classification
- 1.4 System Programmatic Issues
- 2. FUNCTIONAL DESCRIPTION
 - 2.1 Safety Function
 - 2.2 Important-to-Plant Safety Functions
 - 2.3 Non-Safety Functions
 - 2.4 Regulatory Guide 1.97 Functions
- 3. SYSTEM OPERABILITY REQUIREMENTS
- 4. COMPONENT PARAMETERS FOR SYSTEM FUNCTIONALITY
- 5. APPLICABLE CODES, STANDARDS, AND REGULATORY DOCUMENTS
 - 5.1 General Design Criteria
 - 5.2 Regulatory Documents
 - 5.2.1 As Licensed
 - 5.2.2 Since-Licensed
 - 5.3 Codes and Standards
 - 5.3.1 Codes of Record
 - 5.3.2 Additional Codes and Standards
- 6. PROGRAMMATIC ISSUES And ADDITIONAL DESIGN BASES REQUIREMENTS
 - 6.1 Programmatic Issues
 - 6.1.1 Accident Analysis
 - 6.1.2 Single Failure/Common Mode Failure
 - 6.1.3 Internal and External Hazards
 - 6.1.4 Fire Protection/Safe Shutdown
 - 6.1.5 Electrical Separation
 - 6.1.6 Environmental Qualification
 - 6.1.7 Seismic Qualification
 - 6.1.8 Human Factors
 - 6.2 Additional Design Bases Considerations
 - 6.2.1 Testing and Inspection Requirements
 - 6.2.2 Leak Detection
 - 6.2.3 Interlocks

- 6.2.4 Emergency Power Supply
- 6.2.5 Overpressure Protection
- 6.2.6 Operator Actions

7.0 REFERENCES

- 7.1 Cited References
- 7.2 Other System References

8.0 APPENDICES (Additional Appendices are added as required)

- APPENDIX A, Open Item Reports
- APPENDIX B, Technical Data
- APPENDIX C, Tables
- APPENDIX D, Figures
- APPENDIX E, Licensing Bases/Commitments
- APPENDIX F, Significant Design Modifications
- APPENDIX G, Summary of Design Bases Calculations

B. TOPICAL DBD GENERIC OUTLINES

The following generic outline applies to Equipment, Event, and/or Activity Topical DBDs. Since each Topical DBD is unique, the following generic outline guidance is provided for consistency between Topical DBDs to assist users, where possible:

PREFACE

- 0. PURPOSE
- 1. TOPIC DESCRIPTION
 - 1.1 Definition of Topic
 - 1.2 System Applicability
 - 1.3 Background (Event Topicals)
- 2. APPLICABLE CODES, STANDARDS, AND REGULATORY REQUIREMENTS
 - 2.1 General Design Criteria
 - 2.2 Codes and Standards
 - 2.3 Regulatory Documents
- 3. TOPICAL DESIGN BASES
 - 3.1 Historical Bases

3.2 Current Bases

4. TOPICAL REQUIREMENTS
(The applicable sections are selected)

Equipment Related

- 4.1 General Considerations
- 4.2 Functions
 - 4.2.1 Safety Functions
 - 4.2.2 Important-to-plant Safety Function
- 4.3 Parameters
- 4.4 Limitations

Event Related

- 4.1 Functions
 - 4.1.1 Safety Functions
 - 4.1.2 Important-to-plant Safety Function
 - 4.1.3 Non-Safety Functions
- 4.2 Method of Analysis
- 4.3 Results Summary
- 4.4 Conclusions

Activity Related:

- 4.1 Functions
 - 4.1.1 Safety Functions
 - 4.1.2 Important-to-plant Safety Function
 - 4.1.3 Non-Safety Functions
- 4.2 Safety Analysis
- 4.3 Limitations

5. DESIGN BASES MODIFICATION HISTORY

6. REFERENCES

7. APPENDICES

- Appendix A Open Item Reports
- Appendix B Tables
- Appendix C Figures