PARSONS	PP-02

MILLSTONE UNIT 2 ICAVP
PROJECT PROCEDURES

Title:

Accident Mitigation Systems Review

REVISION 2

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REVISION HISTORY

REVISION	DATE	REVISION DESCRIPTION
0	04/03/97	Procedure Initiation
1	06/09/97	Incorporation of NRC Comments
2	06/27/97	Revision for AMSR Process Details

LIST OF EFFECTIVE PAGES

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1.0 PURPOSE

The Accident Mitigation Systems Review (AMSR) will identify and verify the critical design characteristics for accident mitigation systems and their components required to meet the Design Bases Events (DBEv) identified in Chapter 14 of the Millstone Nuclear Plant Unit 2 Updated Final Safety Analyses Report (UFSAR).

2.0 DEFINITIONS

2.1 Design Bases Event (DBEv) - Design Bases Events are defined as those initiating events as presented in Chapter 14 of the UFSAR and form the bases for the operating license of the Millstone Unit 2 Nuclear Power Plant.

2.2 Critical Safety Functions (CSF) - "Critical Safety Functions" are defined as the required specific set of activities that must occur in order to ensure that a success path associated with the design base event mitigation is met and maintained.

2.3 Critical Design Characteristic (CDC) - A critical design characteristic is defined as that aspect of the functional/system design that must be provided to ensure that the system or component will meet the performance criteria identified in Chapter 14 of the UFSAR.

2.4 Critical Parameters - A numerical value associated with a CDC.

3.0 AMSR BASIS

The following documents are the basis for the ICAVP AMSR

- Chapters 14, 6, 7, 8 and 9 of the UFSAR
- Accident Analyses & Supporting Calculations
- Technical Specifications

- Design Basis Documents (DBD)
- System P&IDs & Diagrams
- System Design Descriptions (SDD)
- Design Calculations
- Emergency Operating Procedures
- Safety System Logic Documents
- Safety Evaluation Report (SER)
- Regulatory Commitments

4.0 RESOURCES

The following resources are utilized to perform the AMSR

- System Engineer
- Accident Analyst
- Electrical Engineer
- Mechanical Engineer
- Controls Engineer
- Operations Engineer
- Tier-2 Database

5.0 PROCEDURE

Overview: Determine the critical design characteristics for systems and components that must be confirmed in order to ensure that the plant complies with the safety analyses identified in Chapter 14 of the UFSAR. Validate the presence of the critical design characteristics in the as-documented and installed plant design. The simplified process flowchart is presented in Exhibit 2-1. The DBEv groups covered by this procedures are identified in Exhibit 2-2.

Exhibit 2-1
AMSR Process

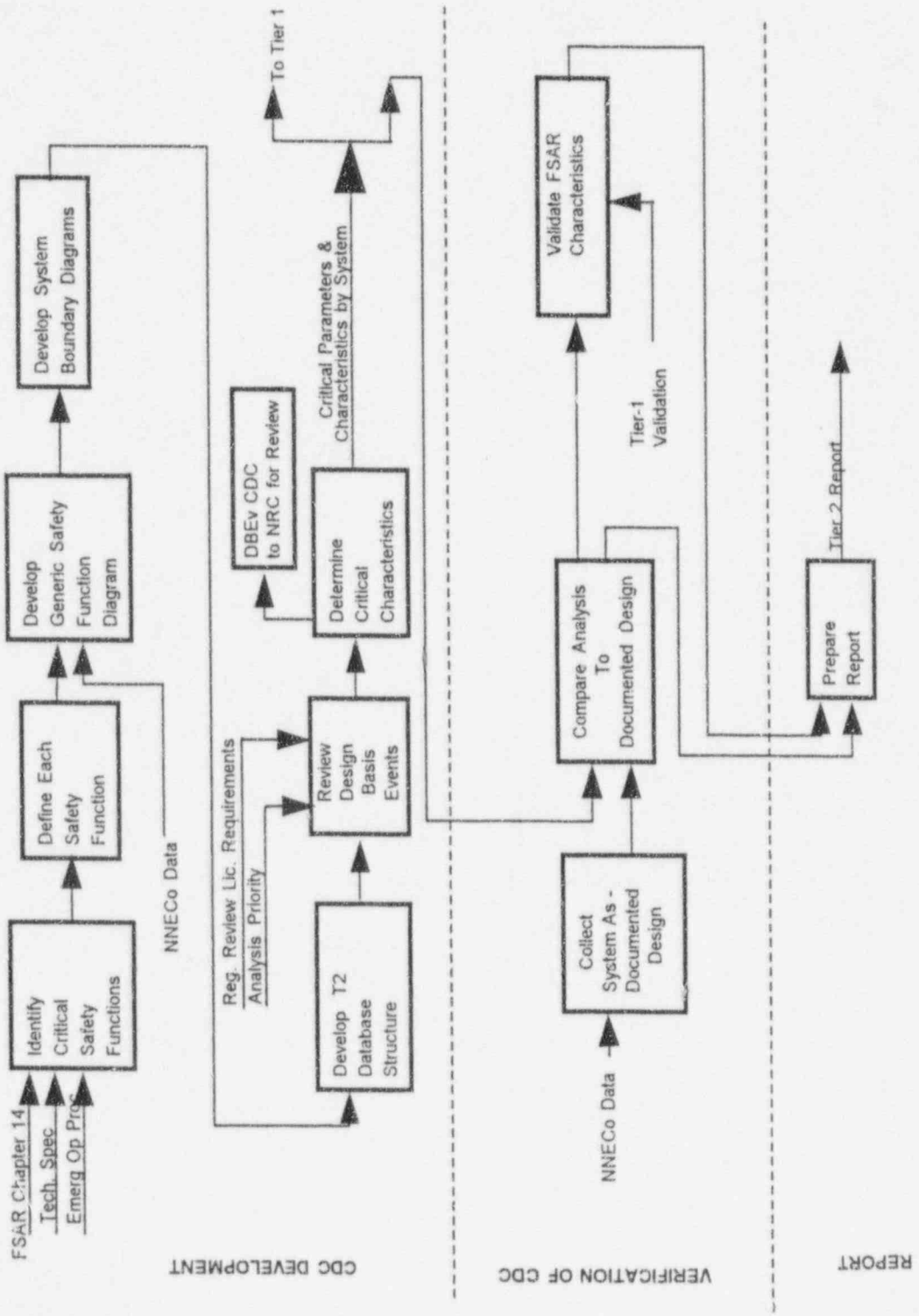


Exhibit 2-2
DBEv GROUPS

DBEv	Variation
Increase in Heat Removal by the Secondary System	Decrease in Feedwater Temperature
	Increase in Feedwater Flow
	Increase in Steam Flow
	Inadvertent Opening of a Steam Generator Relief or Safety Valve
	Steam Pipe Failure Inside and Outside containment
Decrease in Heat Removal by the Secondary System	Loss of External Load
	Turbine Trip
	Closure of Main Steam Isolation Valve
	Loss of Normal Feedwater Flow
Decrease in Reactor Coolant System flow	Loss of Forced Reactor Coolant Flow
	Reactor Coolant Pump Rotor Seizure
Reactivity and Power Distribution Anomalies	Uncontrolled Control Rod Bank Withdrawal From a Subcritical or Low Power Startup Condition
	Uncontrolled Control Rod/Bank Withdrawal at Power
	Control Rod Misoperation
	Startup of an Inactive Loop
	CVCS Malfunction That Results in a Decrease in the Boron Concentration in the Reactor Coolant
	Control Rod Ejection Accident
Decrease in Reactor Coolant inventory	Inadvertent Opening of a Pressurizer PRV
	Steam Generator Tube Failure - Rad Consequences
	LOCA From Breaks in the RCP Boundary
Radioactive Releases from a Subsystem or component	Waste Gas System Failure
	Fuel Handling Accident
	Spent Fuel Cask Drop Accident
Non-Standard Review Plan Events	Containment Analyses
	Hydrogen Accumulation in Containment
	Radiological Consequences of the Design Bases Accident

5.1 CDC DEVELOPMENT - DEFINE CRITICAL SAFETY FUNCTIONS

Purpose

1.1 The purpose of this activity is to develop

- CSF Definitions
- CSF Diagrams
- System Boundary Diagrams
- Tier-2 Database Structure

Action

1.1 Review UFSAR Chapter 14 and identify design bases events by groups (refer to Exhibit 2-2).

1.2 Evaluate DBEv groups to identify Critical Safety Functions essential to achieve and maintain a controlled condition following an event. (e.g. RCS Heat Removal, Reactivity Control, RCS Inventory Control, etc.)

1.3 Define Critical Safety Function objectives and system level processes/actions to achieve objectives.

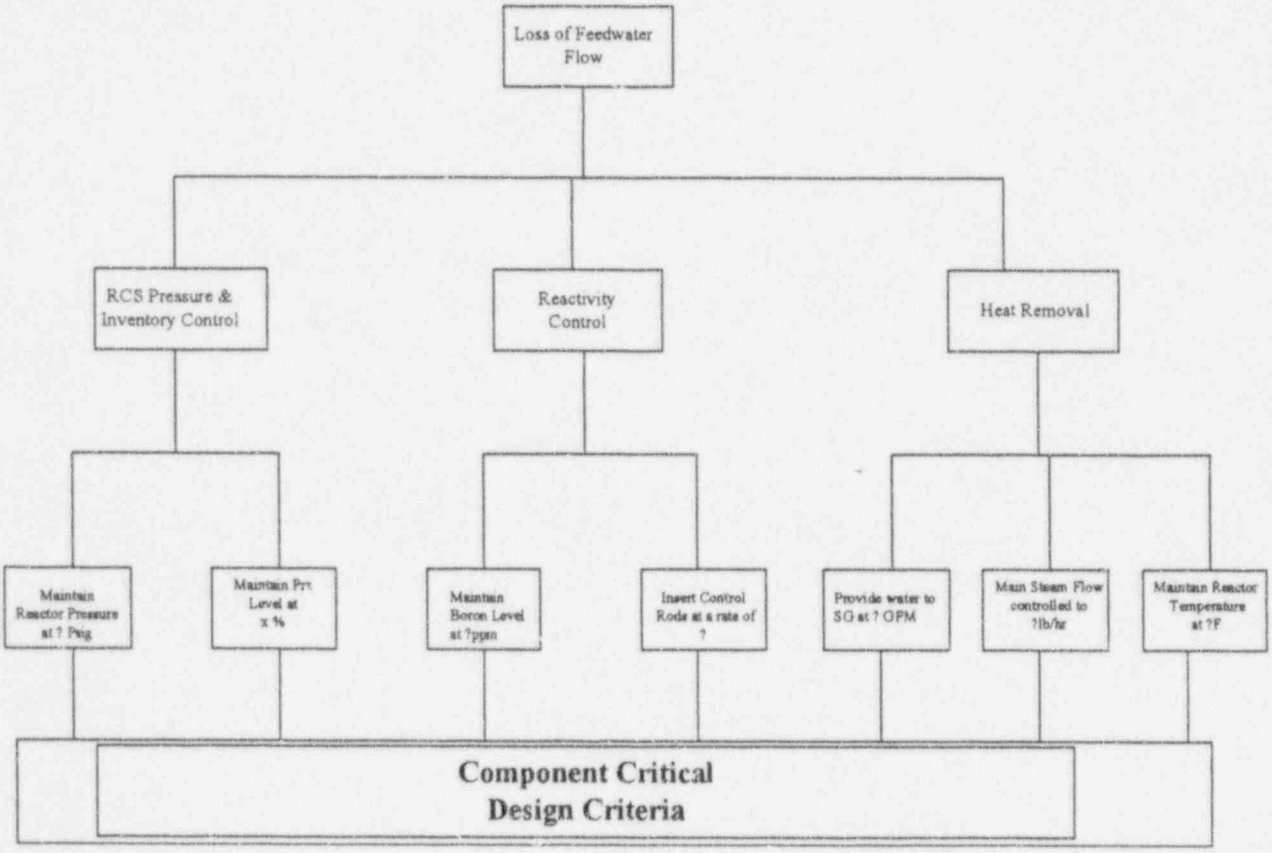
1.4 Create generic Critical Safety Function Diagrams for each Critical Safety Function.

1.5 Identify system level active components that support the process or action. (Example shown as Exhibit 2-3)

1.6 Develop a Boundary Diagram for each System involved with the DBEv.

1.7 Develop a data base structure to record the system and component critical characteristics and parameters for each DBEv.

Exhibit 2-3
SAFETY FUNCTION DIAGRAM



5.2 CDC DEVELOPMENT - IDENTIFY CRITICAL CHARACTERISTICS AND PARAMETERS

Purpose

1.1 The purpose of this activity is to develop

- Functional/system level critical characteristics
- Database file and reports of the critical parameter for each system and DBEv safety function.
- Discrepancy report

Action

1.1 Review each FSAR chapter 14 DBEv, including supporting analyses and calculations, to identify design requirements. Using the Critical Safety Function Diagrams, identify functional/system level critical characteristics for each DBEv.

1.2 Using the System Boundary Diagrams identify the components and their critical parameters essential to achieving the functional/system critical characteristics for each DBEv.

1.3 Identify additional component design requirements from FSAR chapters 6, 7, 8, and 9.

1.4 Enter DBEv critical characteristics and parameters into the Tier 2 database (T2DB) .

1.5 Document source of analyses parameters and key assumptions.

1.6 If an inconsistency exists, a discrepancy report shall be prepared in accordance with the discrepancy report process (PP-07).

1.7 Submit the DBEv functional/system level critical characteristics to the NRC for review.

1.8 Provide system and component critical design data to Tier 1 for Systems selected for review.

5.3 CDC VERIFICATION - IDENTIFY AS-DOCUMENTED DESIGN

Purpose

1.1 The purpose of this activity is to develop

- Critical System/Component listing including performance requirements and capabilities
- Discrepancy Reports

Action

1.1 Develop system composite database for critical safety function systems using documented information (plant design drawings, calculations, DBDs, etc.).

1.2 List component design performance requirements into the T2DB.

1.3 Document references and source information used to identify the important to safety components and systems.

1.4 If a component or system is found to contain a discrepancy, a discrepancy report shall be prepared in accordance with the discrepancy report process (PP-07).

5.4 CDC VERIFICATION - COMPARE ANALYSIS TO AS-DOCUMENTED DESIGN

Purpose

1.1 The purpose of this activity is to develop

- Comparison of the T2DB "as-documented" parameters with the AMSR requirements for critical systems/components.
- Discrepancy Report

Action

1.1 Compare the critical design characteristics and parameters versus the as-documented design for 100% of the functional/system level characteristics derived from FSAR chapters 14, 6, 7, 8 and 9.

1.2 Review Emergency Operating Procedures versus critical design characteristic to determine consistency.

1.3 Document the following information:

- Critical system/component design requirement from the FSAR DBEv review
- As-Documented configuration and references
- Confirmation that the as-documented design meets the design requirement

1.4 Discrepancies between "as-documented" and "as-analyzed" data will be identified in a discrepancy notice and resolved in accordance with PP-07.

5.5 CDC VERIFICATION - VALIDATE FSAR CRITICAL CHARACTERISTICS

Purpose

1.1 The purpose of this activity is to

- Validate that the Functional/System level Critical Design Characteristics are present in the installed plant design.

Action

1.1 Validate 100% of the functional/system level critical characteristics derived from FSAR chapters 14, 6, 7, 8 and 9. This validation will be based on review of plant test data, Technical Specifications, calculations, or alternate methods, as appropriate.

1.2 Tier 1 personnel will validate that the Critical Design Characteristics are in place and properly documented for the NRC selected systems.

1.3 Tier 2 personnel will validate that the Critical Design Characteristics are in place and properly documented for the remaining systems.

1.4 For Tier 1 systems, the Tier 1 Team will validate the Critical Design Characteristics. The SVSR Team will provide the validation through responses on the Tier 2 Validation form. An example of the Verification Form is shown as Exhibit 2-4.

1.5 Systems and components not meeting the Critical Design Characteristics will be identified as a discrepancy in accordance with PP-07.

Exhibit 2-4
AMSR-CDC Verification Form

AMSR- -

System: _____
Component: _____
Characteristic: _____
Parameter(s): _____
T2 Engineer: _____
Date: _____

Component Location:

_____
_____
_____

Testing/Surveillance Document:

Name: _____
Number: _____
Revision: _____

Data found:

_____
_____
_____
_____
_____
_____

Characteristic Found - ☐
Characteristic Verified - ☐ Discrepancy - ☐
Characteristic Missing - ☐

_____

Assessment of Effect from missing characteristic:

_____
_____
_____
_____
_____
_____
_____

Engineer Signature: _____ Date: _____