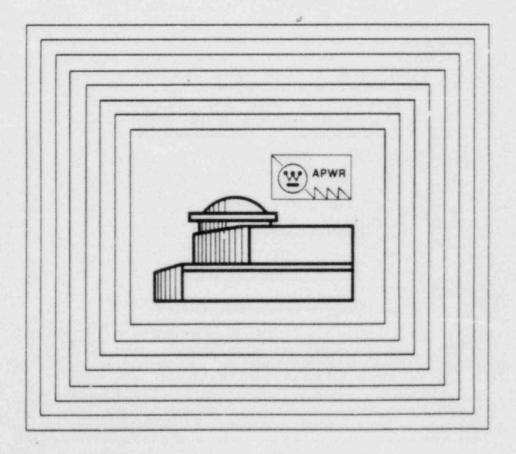
RESAR-SP/90 STRUCTURAL/EQUIPMENT DESIGN

WESTINGHOUSE ADVANCED PRESSURIZED WATER REACTOR

This document contains information proprietary to Westinghouse Electric Corporation; it is submitted in confidence and is to be used solely for the purpose for which it is furnished and returned upon request. This document and such information is not to be reproduced, transmitted, disclosed or used otherwise in whole or in part without the written authorization of Westinghouse Electric Corporation, Nuclear (rergy Systems.



STANDARD PLANT DESIGN

WAPWR-S/E 2106e:1d

TABLE OF CONTENTS

				vererence
				SAR
				Section
	Section	<u>Title</u>	Page	Status
B	1.0	INTRODUCTION AND GENERAL DESCRIPTION OF PLANT	1.1-1	11
	1.1	INTRODUCTION	1.1-1	11
	1.2	GENERAL PLANT DESCRIPTION	1.2-1	11
	1.2.2	Principal Design Criteria	1.2-1	11
	1.6	MATERIAL INCORPORATED BY REFERENCE	1.6-1	11
	1.8	CONFORMANCE WITH THE STANDARD REVIEW PLAN	1.8-1	11
	2.0	SITE CHARACTERISTICS	2.0-1	NA
	3.0	DESIGN OF STRUCTURES, COMPONENTS, EQUIP- MENT AND SYSTEMS	3.1-1	11
	3.1	CONFORMANCE WITH NUCLEAR REGULATORY		
		COMMISSION (NRC) GENERAL DESIGN CRITERIA (GDC)	3.1-2	11
	3.1.1	Overall Requirements	3.1-1	1
	3.1.2	Protection by Multiple Fission Product Barriers	3.1-6	1
	3.1.3	Protection and Reactivity Control Systems	3.1-18	1
	3.1.4	Fluid Systems	3.1-27	1
	3.1.5	Reactor Containment	3.1-44	1
	3.1.6	Fuel and Reactivity Control	3.1-51	1
	3.2	CLASSIFICATION OF STRUCTURES, COMPONENTS, EQUIPMENT AND SYSTEMS	3.2-1	11
	3.2.1	Seismic Classification	3.2-1	1
	3.2.1.1	Definitions	3.2-1	1
	3.2.1.2	Classifications	3.2-2	1
	3.2.2	Classification Systems	3.2-3	1
	3.2.2.1	Nuclear Safety Classification	C.2-3	1

WAPWR-S/E 2106e:1d DECEMBER, 1984

			SAR
			Section
Section	<u>Title</u>	Page	Status
3.2.2.2	Seismic Classification	3.2-3	1
3.2.2.3	Codes and Standards	3.2-4	1
3.3	WIND AND TORNADO LOADINGS	3.3-1	I
3.3.1	Wind Loadings	3.3-1	I
3.3.1.1	Design Wind Velocity	3.3-1	1
3.3.1.2	Determination of Applied Forces	3.3-1	1
3.3.2	Tornado Loadings	3.3-2	I
3.3.2.1	Applicable Design Parameters	3.3-2	1
3.3.2.2	Determination of Forces on Structures	3.3-3	1
3.3.2.3	Ability of Category I Structures to	3.3-4	1
	Perform Despite Failure of Structures		
	Not Designed for Tornado Loads		
3.3.3	Design and Analysis Procedures	3.3-1	1
3.3.4	References	3.3-4	I
3.4	WATER LEVEL (FLOOD) DESIGN	3.4-1	1
3.4.1	Flood Protection	3.4-1	1
3.4.1.1	External Flood Protection	3.4-2	1
3.4.1.1.1	Structural Flood Protection	3.4-2	1
3.4.1.1.2	Surface Drainage System	3.4-3	1
3.4.1.2	Flood Protection for Flooding from	3.4-3	1
	Component Failures		
3.4.1.3	Permanent Dewatering Systems	3.4-4	1
3.4.2	Analysis Procedures	3.4-4	1
3.4.2.1	Analysis Procedures for External Flooding	3.4-4	1
3.4.2.2	Analysis Procedures for Flooding from Component	3.4-5	I

Reference -

			SAR Section	
Section	<u>Title</u>	Page	Status	
3.5	MISSILE PROTECTION	3.5-1	1	
3.5.1	Missile Selection and Description	3.5-1	1	
3.5.1.1	Internally Generated Missiles (Outside Containment)	3.5-2	1	
3.5.1.1.1	Rotating Component Failure Missiles	3.5-2	1	
3.5.1.1.2	Pressurized Component Failure Missiles	3.5-3	1	
3.5.1.2	Internally Generated Missiles (Inside Containment)	3.5-5	1	
3.5.1.2.1	Control Rod Drive Mechanisms	3.5-6	1	
3.5.1.2.2	Valves	3.5-7	1	
3.5.1.2.3	Temperature and Pressure Sensors	3.5-7	1	
3.5.1.2.4	Other Missiles	3.5-8	1	
3.5.1.3	Turbine Missiles	3.5-9	1	
3.5.1.4	Missiles Generated by Natural Phenomena	3.5-9	1	
3.5.1.5	Missiles Generated by Events Near the Site	3.5-10	1	
3.5.1.6	Aircraft Hazards	3.5-10	1	
3.5.1.7	Gravity-Generated Missiles	3.5-10	1	
3.5.2	Structures, Systems, and Components to be Protected from Externally Generated Missiles	3.5-10	1	
3.5.2.1	General General	3.5-10	1	
3.5.2.2	Missile Barriers Within Containment	3.5-11	I	
3.5.2.3	Barriers for Missiles Generated Outside of Plant Structures	3.5-12	1	
3.5.2.4	Missile Barriers Within Plant Structures Other than Containment	3.5-12	I	

Reference

			Reference
			SAR
			Section
Section	<u>Title</u>	Page	Status
3.5.3	Barrier Design Procedures	3.5-13	I
3.5.4	Missile Protection Interface Requirement	3.5-16	1
3.6	PROTECTION AGAINST THE DYNAMIC EFFECTS ASSOCIATED WITH THE POSTULATED RUPTURE OF PIPING	3.6-1	1
3.6.1	Postulated Piping Failures in Fluid Systems Inside and Outside Containment	3.6-1	1
3.6.1.1	Design Bases	3.6-1	1
3.6.1.2	Description	3.6-5	1
3.6.1.3	Safety Evaluation	3.6-5	1
3.6.2	Determination of Break Locations and Dynamic Effects Associated with the Postulated Rupture of Piping	3.6-5	1
3.6.2.1	Criteria Used to Define High/Moderate- Energy Break/Crack Locations and Configurations	3.6-6	1
3.6.2.1.1	High-Energy Break Locations	3.6-6	I
3.6.2.1.2	Types of Breaks/Cracks Postulated	3.6-14	1
3.6.2.1.2.1	ASME Section III Piping Other than RCL Piping - High Energy	3.6-14	1
3.6.2.1.2.2	Nonnuclear Piping - High Energy	3.6-14	1
3.6.2.1.2.3	ASME Section III and Nonnuclear Piping - Moderate Energy	3.6-15	1
3.6.2.1.3	Break/Crack Configuration	3.6-16	I
3.6.2.1.3.1	High-Energy Break Configuration	3.6-16	1
3.6.2.1.3.2	Moderate-Energy Crack Configuration	3.6-18	1

Reference

			SAR Section
Section	<u>Title</u>	Page	Status
3.6.2.2	Analytical Methods to Define Forcing Functions and Response Models	3.6-18	1
3.6.2.2.1	Forcing Functions for Jet Thrust	3.6-18	1
3.6.2.2.1.1	Time Functions of Jet Thrust Force on Intact Reactor Coolant Loop (RCL) Piping	3.6-18	1
3.6.2.2.2	Dynamic Analysis of the Reactor Coolant Loop Piping and Equipment Supports	3.6-21	1
3.6.2.3	Dynamic Analysis Methods to Verify Integrity and Operability	3.6-21	I
3.6.2.3.1	Dynamic Analysis Methods to Verify Integrity and Operability for Other than RCL	3.6-21	1
3.6.2.3.2	Dynamic Analysis Methods to Verify Integrity and Operability for the RCL	3.6-21	1
3.6.2.3.2.1	General	3.6-21	1
3.6.2.3.2.2	Large RCS Piping	3.6-23	1
3.6.2.3.2.3	Small Branch Lines	3.6-24	1
3.6.2.3.3	Types of Pipe Whip Restraints	3.6-24	I
3.6.2.3.3.1	Pipe Whip Restraints	3.6-24	1
3.6.2.3.4	Analytical Methods	3.6-25	1
3.6.2.3.4.1	Pipe Whip Restraints	3.6-25	1
3.6.2.4	Guard Pipe Assembly Design Criteria	3.6-28	1
3.6.2.5	Material to be Submitted for the Operating License Review	3.6-28	I
3.6.2.6	References	3.6-28	1
3.7	SEISMIC DESIGN	3.7-1	1
3.7.1	Seismic Input	3.7-1	1
3.7.1.1	Design Response Spectra	3.7-2	1
WAPWR-S/E 2106e:1d	v1	DEC	EMBER, 1984

			Reference SAR Section
Section	<u>Title</u>	Page	Status
3.7.1.2	Design Time-History	3.7-2	1
3.7.1.3	Critical Damping Valves	3.7-2	1
3.7.1.4	Supporting Media for Seismic Category I Structures	3.7-3	1
3.7.2	Seismic System Analysis	3.7-3	I
3.7.2.1	Seismic Analysis Methods	3.7-4	1
3.7.2.2	Natural Frequencies and Response Loads	3.7-4	1
3.7.2.3	Procedure Used for Modeling	3.7-5	1
3.7.2.4	Soil-Structure Interaction	3.7-5	I .
3.7.2.5	Development for Floor Response Spectra	3.7-7	I
3.7.2.6	Three Components of Earthquake Motion	3.7-8	1
3.7.2.7	Combination of Modal Responses	3.7-8	1
3.7.2.8	Interaction of Non-Category I Structures With Seismic Category I Structures	3.7-8	I
3.7.2.9	Effects of Parameter Variations on Floor Response Spectra	3.7-9	1
3.7.2.10	Use of Constant Vertical Static Factors	3.7-9	I
3.7.2.11	Method Used to Account for Torsional Effects	3.7-9	1
3.7.2.12	Comparison of Responses	3.7-9	1
3.7.2.13	Methods for Seismic Analysis of Dams	3.7-9	1
3.7.2.14	Determination of Seismic Category I Structure Overturning Moment	3.7-10	1
3.7.2.15	Analysis Procedure for Damping	3.7-10	1
3.7.3	Seismic Subsystem Analysis	3.7-10	1
3.7.3.1	Seismic Analysis Methods	3.7-10	1
3.7.3.2	Determination of Number of Earthquake Cycles	3.7-11	1

vii

DECEMBER, 1984

WAPWR-5/E 2106e:1d

			SAR
			Section
Section	<u>Title</u>	Page	Status
3.7.3.3	Procedure Used for the Modeling	3.7-12	1
3.7.3.4	Basis for Selection of Frequencies	3.7-14	1
3.7.3.5	Use of Equipment Static Load Method of Analysis	3.7-14	1
3.7.3.6	Three Components of Earthquake Motion	3.7-15	I
3.7.3.7	Combination of Modal Responses	3.7-15	I
3.7.3.8	Analytical Procedures for Piping	3.7-19	I
3.7.3.9	Multiple Supported Equipment Components with Distinct Inputs	3.7-19	I
3.7.3.10	Use of Constant Vertical Static Factors	3.7-21	1
3.7.3.11	Torsional Effects of Eccentric Masses	3.7-21	1
3.7.3.12	Buried Seismic Category I Piping Systems and Tunnels	3.7-22	1
3.7.3.13	Interaction of Other Pip'ng with Seismic Category I Piping	3.7-22	
3.7.3.14	Seismic Analyses for Reactor Internals (Core, Core Supports, Mechanisms)	3.7-22	1
3.7.3.15	Analysis Procedure for Damping	3.7-23	1
3.7.4	Seismic Instrumentation	3.7-23	1
3.7.4.1	Comparison with Regulatory Guide 1.12	3.7-24	1
3.7.4.2	Location and Description of Instrument	3.7-24	1
3.7.4.2.1	Time-History Accelerograph	3.7-24	1
3.7.4.2.2	Seismic Switch	3.7-26	I
3.7.4.2.3	Triaxial Spectrum Recorder	3.7-26	1
3.7.4.2.4	Triaxial Peak Accelerograph	3.7-27	1
3.7.4.2.5	Criteria for Instrument Location	3.7-28	1
3.7.4.2.6	Seismic Instrumentation Control Panel	3.7-28	1

WAPWR-S/E 2106e:1d

DECEMBER, 1984

Reference

			Reference SAR Section
Section	<u>Title</u>	Page	Status
3.7.4.3	Control Room Operator Nodifications	3.7-28	1
3.7.4.4	Comparison of Measured and Predicted	3.7-29	I
	Responses		
3.7.4.5	Inservice Surveillance	3.7-30	1
3.7.5	References	3.7-30	1
3.8	DESIGN OF CATEGORY I STRUCTURES	3.8-1	1
3.8.1	Concrete Containment	3.8-1	I
3.8.2	Steel Containment	3.8-1	I
3.8.2.1	Description of the Containment	3.8-1	1
3.8.2.2	Applicable Codes, Standards, and	3.8-2	1
	Specifications		
3.8.2.3	Loads and Load Combinations	3.8-3	1
3.8.2.4	Design and Analysis Procedures	3.8-3	10
3.8.2.5	Structural Acceptance Criteria	3.8-4	1
3.8.2.6	Materials, Quality Control, and Special Construction Techniques	3.8-4	I
3.8.2.7	Testing and Inservice Inspection Requirements	3.8-4	I
3.8.3	Concrete and Steel Internal Structures	3.8-5	1
3.8.3.1	Description of the Internal Structures	3.8-5	1
3.8.3.2	Applicable Codes, Standards, and	3.8-6	1
	Specifications		
3.8.3.3	Loads and Load Combinations	3.8-7	I
3.8.3.4	Design and Analysis Procedures	3.8-7	I
3.8.3.5	Structural Acceptance Criteria	3.8-7	1
3.8.3.6	Materials	3.8-7	I
3.8.3.7	Testing and Inservice Inspection Requirements	3.8-8	1

WAPWR-S/E 2106e:1d DECEMBER, 1984

			Reference SAR Section
Section	<u>Title</u>	Page	Status
3.8.4	Other Seismic Category 1 Structures	3.8-8	1
3.8.4.1	Description of the Structures	3.8-8	1
3.8.4.2	Applicable Codes, Standards and	3.8-9	1
	Specifications		
3.8.4.3	Loads and Load Combinations	3.8-9	1
3.8.4.3.1	Loads	3.8-9	1
3.8.4.3.1.1	Normal Loads	3.8-10	I
3.8.4.3.1.2	Environmental Loads	3.8-11	I
3.8.4.3.1.3	Design Basis Accident Loads	3.8-12	I
3.8.4.3.2	Load Combinations	3.8-13	1
3.8.4.4	Design and Analysis Procedures	3.8-13	1
3.8.4.5	Structural Acceptance Criteria	3.8-14	I
3.8.4.6	Materials	3.8-14	I
3.8.4.7	Testing and Inservice Surveillance	3.8-16	I
	Requirements		
3.8.5	Foundations	3.8-16	I
3.8.5.1	Description of the Foundations	3.8-16	1
3.8.5.2	Applicable Codes, Standards and	3.8-16	1
	Specifications		
3.8.5.3	Loads and Loading Combinations	3.8-16	1
3.8.5.4	Design and Analysis Procedures	3.8-16	1
3.8.5.5	Structural Acceptance Criteria	3.8-17	1
3.8.5.6	Materials	3.8-18	1
3.8.5.7	Testing and Inservice Inspection	3.8-18	1
	Requirements		
3.9	MECHANICAL SYSTEMS AND COMPONENTS	3.9-1	II
3.9.1	Special Topics for Mechanical Components	3.9-1	1
3.9.1.1	Design Transients	3.9-1	1
WAPWR-S/E 2106e:1d	×	DECE	MBER, 1984

			Reference
			SAR
			Section
Section	<u>Title</u>	Page	Status
3.9.1.1.1	Level A Service Conditions (Normal	3.9-3	I
	Conditions)		
3.9.1.1.2	Level B Service Conditions (Upset Conditions)	3.9-19	1
3.9.1.1.3	Level C Service Conditions (Emergency	3.9-29	1
	Conditions)		
3.9.1.1.4	Level D Servcic Conditions (Faulted	3.9-31	1
	Conditions		
3.9.1.1.5	Test Conditions	3.9-35	1
3.9.1.2	Computer Programs Used in Analysis	3.9-37	I
3.9.1.2.1	NPB Systems and Components	3.9-37	I
3.9.1.3	Experimental Stress Analysis	3.9-38	1
3.9.1.4	Consideration for the Evaluation of the Faulted Condition	3.9-38	I
3.9.2	Dynamic Testing and Analysis	3.9-38	11
		3.9-38	1
3.9.2.1	Piping Vibration, Thermal Expansion, and Dynamic Effects	3.9-30	
3.9.2.2	Seismic Qualification Testing of Safety- Related Mechanical Equipment	3.9-42	1
3.9.2.3	Dynamic Response Analysis of Reactor	3.9-45	1
	Internals Under Operational Flow Transients and Steady-State Conditions		
3.9.2.4	Preoperational Flow-Induced Vibration	3.9-45	1
	Testing of Reactor Internals		
3.9.2.5	Dynamic System Analysis of the Reactor	3.9-45	1
	Internals Under Faulted Conditions		
3.9.3	ASME Code Class 1, 2, and 3 Components,	3.9-45	I
	Component Supports, and Core Support		
	Structures		
WAPWR-S/E 2106e:1d	xi	DECE	MBER, 1984

			Reference SAR Section
Section	<u>Title</u>	Page	Status
3.9.3.1	Loading Combinations, Design Transients, and Stress Limits	3.9-45	I
3.9.3.1.1	ASME Code Class 1 Components and Supports	3.9-46	1
3.9.3.1.1.1	Analysis of the Reactor Coolant Loop Piping and Supports	3.9-46	I
3.9.3.1.1.2	Class 1 Auxiliary Branch Lines	3.9-55	1
3.9.3.1.1.3	Loading Combinations and Stress Limits	3.9-58	1
3.9.3.1.2	ASME Code Class 2 and 3 Components and Supports	3.9-58	1
3.9.3.1.3	Analysis of Primary Components and Valves	3.9-58	1
3.9.3.2	Pump and Valve Operability Assurance	3.9-60	1
3.9.3.2.1	Pumps	3.9-60	1
3.9.3.3.2	Valves	3.9-62	I
3.9.3.2.3	Pump Motor and Valve Operator Qualification	3.9-64	1
3.9.3.2.4	Active ASME Code Class 2 and 3 Pumps	3.9-64	1
3.9.3.3	Design and Installation Details for Mounting of Pressure Relief Devices	3.9-66	1
3.9.3.3.1	Pressure Relief Devices on NPB Components	3.9-66	1
3.9.3.3.2	Other Pressure Relief Devices on Components	3.9-68	1
3.9.3.4	Component and Piping Supports	3.9-69	1
3.9.3.4.1	ASME Code Class 1 Component Supports	3.9-70	1
3.9.3.4.1.1	Primary Component Supports Models and Methods	3.9-70	1
3.9.3.4.2	ASME Code Class 2 and 3 Supports	3.9-71	1
3.9.3.4.3	Snubbers Used as Component Supports	3.9-72	I

WAPWR-S/E 2106e:1d

DECEMBER, 1984

			Reference
			SAR
			Section
Section	<u>Title</u>	Page	Status
3.9.4	Control Rod Drive Systems	3.9-73	11
3.9.5	Reactor Vessel Internals	3.9-74	11
3.9.5.1	Loading Conditions	3.9-74	1
3.9.5.2	Reactor Vessel and Internals Modeling	3.9-75	I
3.9.5.3	Analytical Methods	3.9-76	1
3.9.6	Inservice Testing of Pumps and Valves	3.9-77	1
3.9.6.1	Inservice Testing of Pumps	3.9-77	1
3.9.6.2	Inservice Testing of Valves	3.9-77	1
3.9.6.3	Rclief Request	3.9-78	1
3.10	SEISMIC QUALIFICATION OF SEISMIC CATEGORY I INSTRUMENTATION AND ELECTRICAL EQUIPMENT	3.10-1	I
3.10.1	Seismic Qualification Criteria	3.10-1	1
3.10.2	Methods and Procedures for Qualifying	3.10-2	1
	Electrical Equipment and Instrumentation		
3.10.2.1	Seismic Qualification by Type Test	3.10-3	1
3.10.2.2	Seismic Qualification by Analysis	3.10-4	1
3.10.2.3	Combined Analysis and Testing	3.10-5	I
3.10.3	Methods and Procedures of Analysis or Testing of Supports of Electrical Equipment and Instrumentation	3.10-5	I
3.10.4	Operating License Review	3.10-6	1
3.10.5	References	3.10-6	1
3.11	ENVIRONMENTAL DESIGN OF MECHANICAL	3.11-1	I
	AND ELECTRICAL EQUIPMENT		
3.11.1	Equipment Identification and Environmental Conditions	3.11-1	1
3.11.2	Qualification Tests and Analyses	3.11-2	1
3.11.2.1	Environmental Qualification Criteria	3.11-2	1
WAPWR-S/E 2106e:1d	xiii	DECE	MBER, 1984

			Reference SAR
Section	Title	Page	Section
Section	Title	Page	Status
3.11.2.2	Performance Requirements for Environmental Qualification	3.11-2	1
3.11.2.3	Methods and Procedures for Environmental Qualification	3.11-3	I
3.11.3	Qualification Test Results .	3.11-3	1
3.11.4	Loss of Ventilation	3.11-3	1
3.11.5	Estimated Chemical and Radiation Environment	3.11-3	1
3.11.6	References	3.11-3	1
4.0	REACTOR	4.0-1	NA
5.0	REACTOR COGLANT SYSTEM AND CONNECTED SYSTEMS	5.0-1	NA
7.0	INSTRUMENTATION CONTROLS	7.0-1	NA
8.0	ELECTRIC POWER	8.0-1	NA
9.0	AUXILIARY SYSTEMS	9.0-1	NA
10.0	STEAM AND POWER CONVERSION SYSTEM	10.0-1	NA
11.0	RADIOACTIVE WASTE MANAGEMENT	11.0-1	NA
12.0	RADIATION PROTECTION	12.0-1	NA
13.0	CONDUCT OF OPERATIONS	13.0-1	NA
14.0	INITIAL TEST PROGRAM	14.0-1	NA
15.0	ACCIDENT ANALYSES	15.0-1	NA
16.0	TECHNICAL SPL IFICATIONS	16.0-1	NA
17.0	QUALITY ASSURANCE	17.0-1	11
17.1	QUALITY ASSURANCE DURING DESIGN AND CONSTRUCTION	17.0-1	11
17.1.1	References	17.0-1	11

LIST OF TABLES

	Number	<u>Title</u>	Page
	1.6-1	Material Incorporated by Reference	1.6-2
	1.8-1	Standard Review Plan Deviations	1.8-2
	3.2-1	Classification of Structures, Components and	
		Systems	
	3.2-2	Principal Codes and Standards	
	3.5-1	Summary of Control Rod Drive Mechanism	3.5-19
		Missile Analysis	
	3.5-2	Valve-Missile Characteristics	3.5-20
	3.5-3	Piping Temperature Element Assembly	3.5-21
		- Missile Characteristics	
	3.5-4	Characteristics of Other Missiles Postulated	3.5-22
		Within Reactor Containment	
4	3.6-1	Essential or Non-essential; High-Energy, or	3.6-29
		Moderate - Energy Systems	
	3.7-1	Regulatory Guide 1.61 Damping Values for	3.7-32
		Structures and Components	
	3.7-2	Seismic Monitoring Instrumentation Requirements	3.7-33
	3.8-1	Containment Load Combinations and Load Factors	3.8-19
	3.8-2	Stress Intensity Limits for Steel Containment	3.8-20
	3.8-3	Load Combinations and Load Factors for	3.8-21
		Category 1 Concrete Structures	
,	3.8-4	Load Combinations and Load Factors for	3.8-25
		Category 1 Steel Structures	
	3.9-1	Summary of Reactor Coolant System Design Transients	3.9-79
	3.9-2	Loading Combinations for ASME Class 1 Components	3.9-83
		and Supports	
	3.9-3	Stress Criteria for ASME B&PV Code Section III	3.8-84
		Class 1 Components and Supports	

LIST OF TABLES (Cont.)

Number	<u>Title</u>	Page
3.9-4	Loading Combinations for ASME Code Class 2 and 3	3.9-86
	Components and Supports for the NPB	
3.9-5	Stress Criteria for ASME B&PV Code	3.9-87
	Section III Class 2 and 3 Components	
3.9-6	Load Combinations and Acceptance Criteria	3.9-88
	for Pressurizer Safety and Relief Valve Piping	
	- Upstream of Valves	
3.9-7	Load Combinations and Acceptance Criteria for	3.9-89
	Pressurizer Safety and Relief Valve Piping	
	Seismically Designed Downstream Portion	
3.9-8	Definitions of Load Abbreviations	3.9-90
3.9-9	Load Combinations for Pressurizers Safety and	3.9-91
	Relief Valve Nozzles and Support Brackets	
3.9-10	Pump Starting/Stopping Conditions	3.9-92
3.10-1	Seismic Category I Instrumentation and Electrical	3.10-7
	Equipment	
3.11-1	Safety-Related Equipment	3.11-4
3.10-1	Equipment	

LIST OF FIGURES

Number	<u>Title</u>	
3.6-1	Analysis Criteria for Mechanistic Pipe Break Approach	
3.6-2	Loss of Reactor Coolant Accident Boundary Limits	
3.6-3	Typical U-Bar Restraint	
3.6-4	Typical EAM Restraint	
3.7-1	Safe Shutdown Earthquake Horizontal Response Spectra	
3.7-2	Safe Shutdown Earthquake Vertical Response Spectra	
3.7-3	Operating Basis Earthquake Horizontal Response Spectra	
3.7-4	Operating Basis Earthquake Vertical Response Spectra	
3.7-5	Comparison of Design Response Spectra - Horizontal Direction 1	
3.7-6	Comparison of Design Response Spectra - Horizontal Direction 2	
3.7-7	Comparison of Design Response Spectra - Vertical Direction	
3.7-8	Westinghouse Position on Damping	
3.7-9	Analytical Model - Seismic System	
3.7-10	Seismic Analysis of Soil-Structure Systems	
3.7-11	Enveloped Floor Response Spectra - Operating Deck (N-S)	
3.7-12	Enveloped Floor Response Spectra - Operating Deck (E-W)	
3.7-13	Enveloped Floor Response Spectra - Operating Deck (Vertical)	
3.7-14	Enveloped Floor Response Spectra - RPV Support (N-S)	
3.7-15	Enveloped Floor Response Spectra - RPV Support (E-W)	
3.7-16	Enveloped Floor Response Spectra - RPV Support (Vertical)	
3.7-17	Enveloped Floor Response Spectra - Control Room (N-S)	
3.7-18	Enveloped Floor Response Spectra - Control Room (E-W)	
3.7-19	Enveloped Floor Response Spectra - Control Room (Vertical)	
3.7-20	Post Seismic Event Data Utilization	
3.9-1	Reactor Coolant Loop Supports System, Dynamic Structural Model	