

U.S. NUCLEAR REGULATORY  
COMMISSION  
DOCKET 50-410  
LICENSE NPF-69

NINE MILE POINT  
NUCLEAR STATION  
UNIT 2

UPDATED SAFETY  
ANALYSIS REPORT

OCTOBER 2016

REVISION 22

**NMP Unit 2 USAR**

CHAPTER 6

LIST OF EFFECTIVE FIGURES

<u>Figure No.</u>	<u>Revision Number</u>	<u>Figure No.</u>	<u>Revision Number</u>
6.2-1	R00	6.2-30	A11
6.2-2	R20	6.2-30A	R15
6.2-3	R20	6.2-31	A11
6.2-4	R20	6.2-31A	R00
6.2-4A	R20	6.2-31B	R00
6.2-4B	R20	6.2-32	A11
6.2-5	R20	6.2-33A	R00
6.2-6	R20	6.2-33B	R00
6.2-7	R20	6.2-34	R20
6.2-8	R20	6.2-34A	R20
6.2-8A	R20	6.2-35	R20
6.2-8B	R20	6.2-35A	R20
6.2-9	R20	6.2-36	R20
6.2-10	R20	6.2-37	R20
6.2-11	R20	6.2-38 Sh 1	R15
6.2-11A	R20	6.2-38 Sh 2	R00
6.2-12	R20	6.2-38 Sh 3	R15
6.2-12A	R20	6.2-38 Sh 4	R05
6.2-13	A00	6.2-38 Sh 5	R03
6.2-14	A00	6.2-38 Sh 6	R03
6.2-15	R20	6.2-38 Sh 7	R13
6.2-16	R20	6.2-38 Sh 8	R05
6.2-17	R20	6.2-38 Sh 9	R05
6.2-18	R20	6.2-38 Sh 10	R15
6.2-19	R20	6.2-38 Sh 11	R03
6.2-20	R20	6.2-38 Sh 12	R00
6.2-21	R20	6.2-39	A00
6.2-22	R20	6.2-39A	R10
6.2-23	R20	6.2-40	A27
6.2-24	R13	6.2-41	A27
6.2-25	R13	6.2-42	A28
6.2-26	R13	6.2-43	A27
6.2-27	R13	6.2-44	R08
6.2-28	R20	6.2-45	R20
6.2-28A	R20	6.2-46	R20
6.2-28B	R20	6.2-46A	R20
6.2-28C	R20	6.2-47	R13
6.2-29	R20	6.2-48	R13
6.2-29A	A11	6.2-49	R13
6.2-29B	A11	6.2-50	R13
6.2-29C	A11	6.2-51	R00
6.2-29D	A11	6.2-52	A11
6.2-29E	A11	6.2-53 Sh 1	A11
6.2-29F	A11	6.2-53 Sh 2	A11
6.2-29G	A11	6.2-53 Sh 3	A11
6.2-29H	A11	6.2-53 Sh 4	A11
6.2-29I	A11	6.2-53 Sh 5	A11
6.2-29J	A11	6.2-53 Sh 6	A11

NMP Unit 2 USAR

CHAPTER 6

LIST OF EFFECTIVE FIGURES (Cont'd.)

<u>Figure No.</u>	<u>Revision Number</u>	<u>Figure No.</u>	<u>Revision Number</u>
6.2-54	A23	6.2-70a	R05
6.2-55	A11	6.2-71a	R15
6.2-56 Sh 1	A11	6.2-71b	R15
6.2-56 Sh 2	A23	6.2-72a	R16
6.2-56 Sh 3	A23	6.2-72b	R00
6.2-56 Sh 4	A23	6.2-72c	A07
6.2-56 Sh 5	A23	6.2-72d	R20
6.2-56 Sh 6	A23	6.2-72e	R20
6.2-56 Sh 7	A23	6.2-72f	R20
6.2-56 Sh 8	A23	6.2-72g	R20
6.2-56 Sh 9	R15	6.2-72h	R20
6.2-56 Sh 10	A23	6.2-72i	R20
6.2-57	A11	6.2-72j	A15
6.2-58	A11	6.2-72k Sh 1	R13
6.2-59 Sh 1	A11	6.2-72k Sh 2	R03
6.2-59 Sh 2	A11	6.2-72k Sh 3	R03
6.2-59 Sh 3	A11	6.2-72k Sh 4	R03
6.2-59 Sh 4	A11	6.2-72k Sh 5	R03
6.2-59 Sh 5	A11	6.2-73A	R13
6.2-60	A23	6.2-74	A10
6.2-61	A11	6.2-75	R03
6.2-62 Sh 1	A11	6.2-75a	R03
6.2-62 Sh 2	A11	6.2-75b	R03
6.2-62 Sh 3	A11	6.2-76	R03
6.2-62 Sh 4	A11	6.2-77	R08
6.2-62 Sh 5	A11	6.2-78	A04
6.2-62A	A11	6.2-79	A18
6.2-63	A11	6.2-80	A25
6.2-64 Sh 1	A11	6.2-81	A18
6.2-64 Sh 2	A11	6.2-82	A25
6.2-64 Sh 3	A11	6.2-83	R01
6.2-64 Sh 4	A11	6.2-84	R16
6.2-64 Sh 5	A11	6.2-85	A18
6.2-64A	A11	6.2-86	A28
6.2-65	A11	6.2-87	A13
6.2-66 Sh 1	A11	6.2-88	A27
6.2-66 Sh 2	A11	6.2-89	A27
6.2-66 Sh 3	A11	6.2-90	A27
6.2-66 Sh 4	A11	6.2-91	R04
6.2-66 Sh 5	A11	6.2-92	R04
6.2-66 Sh 6	A11	6.2-93	R04
6.2-66A	A11	6.2-94	R04
6.2-67	A11	6.2-95a	R16
6.2-68	A11	6.2-95b	R15
6.2-68A	A27	6.2-95c	R08
6.2-69	A27	6.2-95d	R15
6.2-69A	A11		
6.2-70	R05	6.3-1 Sh 1	R18

**NMP Unit 2 USAR**

CHAPTER 6

LIST OF EFFECTIVE FIGURES (Cont'd.)

<u>Figure No.</u>	<u>Revision Number</u>	<u>Figure No.</u>	<u>Revision Number</u>
6.3-1 Sh 2	R08	6.3-43	<b>R22</b>
6.3-2	R13	6.3-44	<b>R22</b>
6.3-3a	R13	6.3-45	<b>R22</b>
6.3-3b	R13	6.3-46	<b>R22</b>
6.3-4a	R13	6.3-47	<b>R22</b>
6.3-4b	R13	6.3-48	<b>R22</b>
6.3-5a	R17	6.3-49	<b>R22</b>
6.3-5b	R13	6.3-50	<b>R22</b>
6.3-5c	R07	6.3-51	<b>R22</b>
6.3-6a	R16	6.3-52	<b>R22</b>
6.3-6b	R21	6.3-53	<b>R22</b>
6.3-7a	R20	6.3-54	<b>R22</b>
6.3-8	R07	6.3-55	<b>R22</b>
6.3-9	R07	6.3-56	<b>R22</b>
6.3-10	<b>R22</b>	6.3-57	<b>R22</b>
6.3-11	<b>R22</b>	6.3-58	<b>R22</b>
6.3-12	<b>R22</b>	6.3-59	<b>R22</b>
6.3-13	<b>R22</b>	6.3-60	<b>R22</b>
6.3-14	<b>R22</b>	6.3-61	<b>R22</b>
6.3-15	<b>R22</b>	6.3-62	<b>R22</b>
6.3-16	<b>R22</b>	6.3-63	<b>R22</b>
6.3-17	<b>R22</b>	6.3-64	<b>R22</b>
6.3-18	<b>R22</b>		
6.3-19	<b>R22</b>	6.5-1 Sh 1	R17
6.3-20	<b>R22</b>	6.5-1 Sh 2	R17
6.3-21	<b>R22</b>	6.5-1 Sh 3	R04
6.3-22	<b>R22</b>	6.5-1 Sh 4	R17
6.3-23	<b>R22</b>	6.5-1 Sh 5	R17
6.3-24	<b>R22</b>	6.5-1 Sh 6	R16
6.3-25	<b>R22</b>	6.5-1 Sh 7	R20
6.3-26	<b>R22</b>	6.5-1 Sh 8	R17
6.3-27	<b>R22</b>		
6.3-28	<b>R22</b>	6A.1-1	A17
6.3-29	<b>R22</b>	6A.1-2	A00
6.3-30	<b>R22</b>	6A.1-3	R02
6.3-31	<b>R22</b>	6A.2-1	A00
6.3-32	<b>R22</b>	6A.2-2	A00
6.3-33	<b>R22</b>	6A.2-3	A00
6.3-34	<b>R22</b>	6A.2-4	A00
6.3-35	<b>R22</b>	6A.2-5	R00
6.3-36	<b>R22</b>	6A.2-6	R02
6.3-37	R07	6A.2-7	R02
6.3-38	R07	6A.2-8	R00
6.3-39	R07	6A.2-9	R00
6.3-40	R07	6A.2-10	R00
6.3-41	R22	6A.2-11	R00
6.3-42	R22	6A.2-12	R00

NMP Unit 2 USAR

CHAPTER 6

LIST OF EFFECTIVE FIGURES (Cont'd.)

<u>Figure No.</u>	<u>Revision Number</u>	<u>Figure No.</u>	<u>Revision Number</u>
6A.2-13	R02	6A.4-30	R05
6A.2-14	R00	6A.4-31	R05
6A.2-15	R00	6A.4-32	R05
6A.2-16	A00	6A.4-33	R05
6A.2-17	R00	6A.4-34	R05
6A.2-18	R00	6A.4-35	R05
6A.2-19	R00	6A.4-36	R00
6A.2-20	R00	6A.4-37	R00
6A.2-21	R08	6A.4-38	A00
6A.2-22	R00	6A.4-39	R02
6A.2-23	R00	6A.4-40	R00
6A.2-24	R00	6A.4-41	R00
6A.2-25	R08	6A.4-42	R00
6A.2-26	A00	6A.4-43	A00
6A.3-1	R05	6A.4-44	A00
6A.3-2	R05	6A.4-45	A00
6A.3-3	R05	6A.4-46	R05
6A.3-4	R05	6A.4-47	R00
6A.3-5	R05	6A.4-48	R01
6A.4-1	R00	6A.4-49	R05
6A.4-2	R08	6A.4-50	A21
6A.4-3	R08	6A.4-51	A25
6A.4-4	R08	6A.4-52	A21
6A.4-5	R08	6A.4-53	A21
6A.4-6	A00	6A.4-54	A21
6A.4-7	R08	6A.4-55	A21
6A.4-8	R05	6A.4-56	A21
6A.4-9	R05	6A.4-57	A21
6A.4-10	R05	6A.5-1	A00
6A.4-11	R00	6A.5-2	A00
6A.4-12	R05	6A.5-3	A00
6A.4-13	A17	6A.5-4	A00
6A.4-14	R05	6A.5-5	A00
6A.4-15	R05	6A.5-6	R04
6A.4-16	R05	6A.5-7	A00
6A.4-17	R05	6A.5-8	A00
6A.4-18	R05	6A.5-9	A00
6A.4-19	R05	6A.5-10	A00
6A.4-20	R05	6A.5-11	A00
6A.4-21	R05	6A.5-12	A23
6A.4-22	R05	6A.5-13	A00
6A.4-23	R05	6A.5-14	A00
6A.4-24	R05	6A.5-15	A00
6A.4-25	R05	6A.5-16	A00
6A.4-26	R05	6A.5-17	A00
6A.4-27	R05	6A.5-18	A00
6A.4-28	R05	6A.5-19	A00
6A.4-29	R05	6A.5-20	A16

NMP Unit 2 USAR

CHAPTER 6

LIST OF EFFECTIVE FIGURES (Cont'd.)

<u>Figure No.</u>	<u>Revision Number</u>	<u>Figure No.</u>	<u>Revision Number</u>
6A.5-21	A00	6A.10-4	R00
6A.5-22	A00	6A.10-5	R00
6A.5-23	A00	6A.10-6	R00
6A.5-24	A00	6A.10-6a	R08
6A.5-25	A00	6A.10-6b	R20
6A.5-26	A23	6A.10-7	R00
6A.5-27	A23	6A.10-7a	R20
6A.5-28	A23	6A.10-8	R00
6A.5-29	A23	6A.10-9	R00
6A.5-30	A23	6A.10-10	R00
6A.5-31	A23	6A.10-11	R01
6A.5-32	A00	6A.10-12	R01
6A.5-33	A23	6A.10-12a	R20
6A.5-34	A23	6A.10-13	R01
6A.5-35	A00	6A.10-14	A22
6A.5-36	A00	6A.10-15	A22
6A.5-37	A23	6A.10-16	A22
6A.5-38	A23	6A.10-17	A22
6A.5-39	A23	6A.10-18	A22
6A.5-40	A23	6A.10-19	A22
6A.5-41	A23	6A.10-20	A22
6A.5-42	A23		
6A.5-43	A23	6B-1	A00
6A.9-1	R07	6B-2	A00
6A.9-2	A23		
6A.9-3	R07	6C-1	R08
6A.10-1	A21		
6A.10-2	R00		
6A.10-3	R00		

**NMP Unit 2 USAR**

CHAPTER 6

LIST OF EFFECTIVE FIGURES (Cont'd.)

CHAPTER 6D - PROPRIETARY

<u>Figure No.</u>	<u>Revision Number</u>	<u>Figure No.</u>	<u>Revision Number</u>
F 6D.3-1	R05		
F 6D.3-2	R05		
F 6D.3-3	R05		
F 6D.3-4	R05		
F 6D.3-5	R05		
F 6D.3-6	R05		
F 6D.3-7	R05		
F 6D.3-8	R05		
F 6D.3-9	R05		
F 6D.3-10	R05		
F 6D.3-11	R05		
F 6D.3-12	R05		
F 6D.3-13	R05		
F 6D.3-14	R05		
F 6D.3-15	R05		
F 6D.3-16	R05		
F 6D.3-17	R05		
F 6D.3-18	R05		
F 6D.3-19	R05		
F 6D.3-20	R05		
F 6D.3-21	R05		
F 6D.3-22	R05		
F 6D.3-23	R05		
F 6D.3-24	R05		
F 6D.3-25	R05		
F 6D.3-26	R05		
F 6D.3-27	R05		
F 6D.3-28	R05		
F 6D.3-29	R05		
F 6D.3-30	R05		
F 6D.3-31	R05		
F 6D.3-32	R05		
F 6D.3-33	R05		
F 6D.3-34	R05		
F 6D.3-35	R05		
F 6D.3-36	R05		
F 6D.3-37	R05		
F 6D.3-38	R05		
F 6D.3-39	R05		

# NMP Unit 2 USAR

## CHAPTER 6

### ENGINEERED SAFETY FEATURES

#### TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>
6.1	ENGINEERED SAFETY FEATURE MATERIALS
6.1.1	Metallic Materials
6.1.1.1	Materials Selection and Fabrication
6.1.1.1.1	Specifications for Principal ESF Pressure-Retaining Materials
6.1.1.1.2	ESF Construction Material
6.1.1.1.3	Integrity of ESF Components During Manufacturing and Construction
6.1.1.1.4	Weld Fabrication and Assembly of Stainless Steel ESF Components (Non-NSSS Supplied Components)
6.1.1.2	Composition, Compatibility, and Stability of Containment and Core Spray Coolants
6.1.2	Organic Materials
6.1.2.1	Protective Coatings in the Suppression Pool
6.1.2.2	Protective Coatings in the Drywell
6.2	CONTAINMENT SYSTEMS
6.2.1	Containment Functional Design
6.2.1.1	Containment Structure
6.2.1.1.1	Design Bases
6.2.1.1.2	Design Features
6.2.1.1.3	Design Evaluation
6.2.1.1.4	Sensitivity of Suppression Chamber Air Space Temperature Increase on LOCAs
6.2.1.1.5	Deleted
6.2.1.1.6	Impact of Extended Power Uprate on Containment Response Analysis
6.2.1.1.7	Impact of Maximum Extended Load Line Limit-Plus (MELLLA+) Operation on Containment Response Analysis
6.2.1.2	Containment Subcompartments
6.2.1.2.1	Design Bases
6.2.1.2.2	Design Features
6.2.1.2.3	Design Evaluation
6.2.1.2.4	Asymmetric LOCA Loads
6.2.1.2.5	Impact of Extended Power Uprate on Subcompartment Pressurization and Annulus Pressurization Evaluations
6.2.1.3	Mass and Energy Release for Postulated Loss-of-Coolant Accidents
6.2.1.3.1	Mass and Energy Release Data

## NMP Unit 2 USAR

### CHAPTER 6

#### TABLE OF CONTENTS (Cont'd.)

<u>Section</u>	<u>Title</u>
6.2.1.3.2	Energy Sources
6.2.1.3.3	Effects of Metal-Water Reaction
6.2.1.4	Mass and Energy Release Analysis for Postulated Secondary System Pipe Ruptures Inside Containment (PWR)
6.2.1.5	Minimum Containment Pressure Analysis for Performance Capability Studies on Emergency Core Cooling System (PWR)
6.2.1.6	Testing and Inspection
6.2.1.7	Instrumentation Requirements
6.2.2	Containment Heat Removal System
6.2.2.1	Design Bases
6.2.2.2	System Design
6.2.2.3	Design Evaluation
6.2.2.3.1	Containment Sprays
6.2.2.3.1.1	Design Bases
6.2.2.3.1.2	System Design
6.2.2.3.1.3	Design Evaluation
6.2.2.3.2	NPSH Availability
6.2.2.3.3	Heat Removal
6.2.2.4	Tests and Inspections
6.2.2.5	Instrumentation Requirements
6.2.3	Secondary Containment Functional Design
6.2.3.1	Design Bases
6.2.3.2	System Design
6.2.3.2.1	Reactor Building Ventilation System
6.2.3.2.2	Postaccident Design Provisions
6.2.3.2.3	Bypass Leakage Paths
6.2.3.2.4	Bypass Leakage Rates
6.2.3.2.5	Iodine Plateout Considerations
6.2.3.2.6	Activity Transport Delay Considerations
6.2.3.3	Design Evaluation
6.2.3.3.1	LOCA Temperature and Pressure Transient
6.2.3.3.1.1	Summary and Conclusions
6.2.3.3.1.2	Calculation Approach
6.2.3.3.1.3	Assumptions
6.2.3.3.2	High-Energy Line Break Evaluation
6.2.3.4	Test and Inspection
6.2.3.5	Instrumentation Requirements
6.2.4	Primary Containment Isolation System
6.2.4.1	Design Bases
6.2.4.1.1	Safety Design Bases
6.2.4.2	System Design

## NMP Unit 2 USAR

### CHAPTER 6

#### TABLE OF CONTENTS (Cont'd.)

<u>Section</u>	<u>Title</u>
6.2.4.3	Design Evaluation
6.2.4.3.1	Introduction
6.2.4.3.2	Evaluation Against General Design Criteria
6.2.4.3.3	Failure Modes and Effects Analysis
6.2.4.3.4	Operator Actions
6.2.4.4	Tests and Inspections
6.2.5	Combustible Gas Control in Containment
6.2.5.1	Design Bases
6.2.5.2	System Design
6.2.5.2.1	Atmospheric Mixing
6.2.5.2.2	Hydrogen Recombiner System
6.2.5.2.3	Primary Containment Nitrogen Inerting System
6.2.5.2.4	Primary Containment Purge
6.2.5.2.5	Hydrogen and Oxygen Monitoring System
6.2.5.3	Design Evaluation
6.2.5.3.1	Sources of Oxygen and Hydrogen
6.2.5.3.2	Accident Description
6.2.5.3.3	Analysis
6.2.5.3.4	Failure Modes and Effects Analysis
6.2.5.4	Tests and Inspections
6.2.5.5	Instrumentation Requirements
6.2.6	Containment Leakage Testing
6.2.6.1	Containment Integrated Leakage Rate Test (ILRT) (Type A Test)
6.2.6.2	Containment Penetration Leakage Rate Tests (Type B Tests)
6.2.6.3	Primary Containment Isolation Valve Leakage Rate Tests (Type C Tests)
6.2.6.4	Additional Requirements
6.2.6.5	Scheduling and Reporting of Periodic Tests
6.2.6.6	Special Testing Requirements
6.2.7	References
6.3	EMERGENCY CORE COOLING SYSTEMS
6.3.1	Design Bases and Summary Description
6.3.1.1	Design Bases
6.3.1.1.1	Performance and Functional Requirements
6.3.1.1.2	Reliability Requirements
6.3.1.1.3	ECCS Requirements for Protection from Physical Damage
6.3.1.1.4	ECCS Environmental Design Basis
6.3.1.2	Summary Descriptions of ECCS

# NMP Unit 2 USAR

## CHAPTER 6

### TABLE OF CONTENTS (Cont'd.)

<u>Section</u>	<u>Title</u>
6.3.1.2.1	High-Pressure Core Spray
6.3.1.2.2	Low-Pressure Core Spray
6.3.1.2.3	Low-Pressure Coolant Injection
6.3.1.2.4	Automatic Depressurization System
6.3.2	System Design
6.3.2.1	Schematic Piping and Instrumentation Diagrams
6.3.2.2	Equipment and Component Descriptions
6.3.2.2.1	High-Pressure Core Spray System
6.3.2.2.2	Automatic Depressurization System
6.3.2.2.3	Low-Pressure Core Spray System
6.3.2.2.4	Low-Pressure Coolant Injection
6.3.2.2.5	ECCS Discharge Line Fill System
6.3.2.3	Applicable Codes and Classifications
6.3.2.4	Materials Specifications and Compatibility
6.3.2.5	System Reliability
6.3.2.6	Protection Provisions
6.3.2.7	Provisions for Performance Testing
6.3.2.8	Manual Actions
6.3.3	ECCS Performance Evaluation
6.3.3.1	ECCS Bases for Technical Specifications
6.3.3.2	Acceptance Criteria for ECCS Performance
6.3.3.3	Single-Failure Considerations
6.3.3.4	System Performance During the Accident
6.3.3.5	Use of Dual Function Components for ECCS
6.3.3.6	Limits on ECCS Parameters
6.3.3.7	ECCS Analyses for LOCA
6.3.3.7.1	LOCA Analysis Procedures and Input Variables
6.3.3.7.2	Accident Description
6.3.3.7.3	Break Spectrum Calculations
6.3.3.7.4	Large Recirculation Line Break Calculations
6.3.3.7.5	Transition Recirculation Line Break Calculations
6.3.3.7.6	Small Recirculation Line Break Calculations
6.3.3.7.7	Calculations for Other Break Locations
6.3.3.7.8	Updated ECCS-LOCA Results
6.3.3.8	LOCA Analysis Conclusions
6.3.4	Tests and Inspections

## NMP Unit 2 USAR

### CHAPTER 6

#### TABLE OF CONTENTS (Cont'd.)

<u>Section</u>	<u>Title</u>
6.3.4.1	ECCS Performance Tests
6.3.4.2	Reliability Tests and Inspections
6.3.4.2.1	HPCS Testing
6.3.4.2.2	ADS Testing
6.3.4.2.3	LPCS Testing
6.3.4.2.4	LPCI Testing
6.3.5	Instrumentation Requirements
6.3.6	References
6.4	HABITABILITY SYSTEMS
6.4.1	Design Basis
6.4.2	System Design
6.4.2.1	Definition of the Main Control Room Envelope
6.4.2.2	Ventilation System Design
6.4.2.3	Leak-tightness
6.4.2.4	Interaction with Other Zones and Pressure-Containing Equipment
6.4.2.5	Shielding Design
6.4.2.6	Portable Self-Contained Air Breathing Units
6.4.3	System Operational Procedures
6.4.4	Design Evaluation
6.4.4.1	Radiological Protection
6.4.5	Testing and Inspection
6.4.6	Instrumentation Requirements
6.5	FISSION PRODUCT REMOVAL AND CONTROL SYSTEMS
6.5.1	Engineered Safety Feature Filter Systems
6.5.1.1	Design Bases
6.5.1.2	System Design
6.5.1.2.1	General System Description
6.5.1.2.1.1	SGTS Modes of Operation
6.5.1.2.2	System Component Description
6.5.1.3	Design Evaluation
6.5.1.4	Tests and Inspection
6.5.1.4.1	Preoperational Testing
6.5.1.4.2	In-service Testing
6.5.1.5	Instrumentation Requirements
6.5.1.6	Materials
6.5.2	Containment Spray System
6.5.3	Fission Product Control System
6.6	INSERVICE INSPECTION OF ASME CLASS 2 AND 3 COMPONENTS
6.6.1	Components Subject to Examination
6.6.2	Accessibility

## NMP Unit 2 USAR

### CHAPTER 6

#### TABLE OF CONTENTS (Cont'd.)

<u>Section</u>	<u>Title</u>
6.6.3	Examination Techniques and Procedures
6.6.4	Inspection Intervals
6.6.5	Examination Categories and Requirements
6.6.6	Evaluation of Examination Results
6.6.7	System Pressure Tests
6.6.8	Augmented Inservice Inspection to Protect Against Postulated Piping Failures
APPENDIX 6A	DESIGN ASSESSMENT REPORT FOR HYDRODYNAMIC LOADS
APPENDIX 6B	THREED SUBCOMPARTMENT ANALYTICAL MODEL
APPENDIX 6C	HUMPHREY CONCERNS
APPENDIX 6D	DESIGN ASSESSMENT REPORT FOR HYDRODYNAMIC LOADS (PROPRIETARY)

**NMP Unit 2 USAR**

CHAPTER 6

LIST OF FIGURES

<u>Figure Number</u>	<u>Title</u>
6.1-1	PRINCIPAL PRESSURE-RETAINING MATERIAL FOR ESF COMPONENTS
6.1-2	PRINCIPAL ESF COMPONENT MATERIALS
6.1-3	UNQUALIFIED PROTECTIVE COATINGS AND ORGANIC MATERIALS USED INSIDE THE PRIMARY CONTAINMENT
6.2-1	THERMOPHYSICAL PROPERTIES OF PASSIVE HEAT SINKS
6.2-2	MODELING OF PASSIVE HEAT SINKS
6.2-3	CONTAINMENT DESIGN PARAMETERS
6.2-4	RESULTS OF LARGE BREAK ACCIDENT ANALYSIS (CASE C)
6.2-5	LONG-TERM PRIMARY CONTAINMENT RESPONSE SUMMARY - RECIRCULATION SUCTION LINE DER (OLTP ANALYSIS)
6.2-5a	LONG-TERM PRIMARY CONTAINMENT RESPONSE SUMMARY - RECIRCULATION SUCTION LINE DER (EPU ANALYSIS)
6.2-6	ENGINEERED SAFETY FEATURE SYSTEMS INFORMATION FOR CONTAINMENT RESPONSE ANALYSES (FOR LARGE BREAK ACCIDENTS)
6.2-7	MASS AND ENERGY RELEASE DATA - OLTP ANALYSIS (RECIRCULATION SUCTION LINE DER WITH FEEDWATER (CASE C))
6.2-8	MASS AND ENERGY RELEASE DATA - OLTP ANALYSIS (RECIRCULATION SUCTION LINE DER WITHOUT FEEDWATER (CASE C))
6.2-9	INITIAL CONDITIONS FOR CONTAINMENT RESPONSE ANALYSIS (OLTP ANALYSIS)
6.2-9a	INITIAL CONDITIONS FOR CONTAINMENT RESPONSE ANALYSIS (EPU ANALYSIS)
6.2-10	DECAY HEAT RATE AFTER SCRAM - OLTP ANALYSIS
6.2-10a	DECAY HEAT RATE AFTER SCRAM - EPU LONG-TERM ANALYSIS

CHAPTER 6

## NMP Unit 2 USAR

### CHAPTER 6

#### LIST OF TABLES (Cont'd)

<u>Table Number</u>	<u>Title</u>
6.2-11	FISSION POWER COASTDOWN HEAT TO COOLANT - OLTP ANALYSIS
6.2-12	HEAT TO COOLANT FROM FUEL AND HOT METALS - OLTP ANALYSIS (RECIRCULATION SUCTION LINE DER WITH FEEDWATER (CASE C))
6.2-13	METAL-WATER REACTION HEAT RATE - OLTP ANALYSIS
6.2-14	ECCS PUMP HEAT TO COOLANT (CASES B AND C) - OLTP ANALYSIS
6.2-14a	ECCS PUMP HEAT TO COOLANT (CASE C) - EPU LONG-TERM ANALYSIS
6.2-15	ENERGY BALANCE - OLTP ANALYSIS (RECIRCULATION SUCTION LINE DER WITH FEEDWATER (CASE C))
6.2-16	ACCIDENT CHRONOLOGY - OLTP ANALYSIS (CASE C - WITH FEEDWATER)
6.2-16a	ACCIDENT CHRONOLOGY - EPU ANALYSIS (CASE C - WITH FEEDWATER)
6.2-17	EFFECT OF DRYWELL VOLUME ON PEAK DRYWELL PRESSURE - OLTP ANALYSIS (RECIRCULATION SUCTION LINE DER (CASE C))
6.2-18	EFFECT OF FEEDWATER ON PEAK DRYWELL PRESSURE - OLTP ANALYSIS (RECIRCULATION SUCTION LINE DER (CASE C))
6.2-19	EFFECT OF AIR CARRYOVER FROM DRYWELL ON PEAK DRYWELL PRESSURE - OLTP ANALYSIS (RECIRCULATION SUCTION LINE DER (CASE C))
6.2-20	EFFECT OF DOWNCOMER LOSS FACTOR ON PEAK DRYWELL PRESSURE - OLTP ANALYSIS (RECIRCULATION SUCTION LINE DER (CASE C))
6.2-20a	EFFECT OF NO. OF DOWNCOMERS ON PEAK DRYWELL PRESSURE - OLTP ANALYSIS (RECIRCULATION SUCTION LINE DER (CASE C))
6.2-21	EFFECT OF STEAM BYPASS ON PEAK DRYWELL PRESSURE - OLTP ANALYSIS (MAIN STEAM LINE DER (CASE C))

## NMP Unit 2 USAR

### CHAPTER 6

#### LIST OF TABLES (Cont'd)

<u>Table Number</u>	<u>Title</u>
6.2-22	EFFECT OF DOWNCOMER SUBMERGENCE ON PEAK DRYWELL PRESSURE - OLTP ANALYSIS (RECIRCULATION SUCTION LINE DER (CASE C))
6.2-23	EFFECT OF SUPPRESSION CHAMBER VOLUME ON PEAK DRYWELL PRESSURE - OLTP ANALYSIS (RECIRCULATION SUCTION LINE DER (CASE C))
6.2-24	EFFECT OF INITIAL HUMIDITY ON PEAK DRYWELL PRESSURE - OLTP ANALYSIS (RECIRCULATION SUCTION LINE DER (CASE C))
6.2-25	EFFECT OF INITIAL DRYWELL TEMPERATURE ON PEAK DRYWELL PRESSURE - OLTP ANALYSIS (RECIRCULATION SUCTION LINE DER (CASE C))
6.2-26	EFFECT OF INITIAL POOL AND SUPPRESSION CHAMBER TEMPERATURE ON PEAK DRYWELL PRESSURE - OLTP ANALYSIS (RECIRCULATION SUCTION LINE DER (CASE C))
6.2-27	EFFECT OF BREAK AREA ON PEAK DRYWELL PRESSURE - OLTP ANALYSIS (RECIRCULATION SUCTION LINE DER (CASE C))
6.2-27A	STEAM BYPASS ANALYSIS HEAT BALANCE SUMMARY CONTAINMENT HEAT REMOVAL SUMMARY
6.2-28	PRIMARY CONTAINMENT SUBCOMPARTMENT ANALYSIS SUMMARY
6.2-29	SUBCOMPARTMENT NODAL DESCRIPTION
6.2-30	SUBCOMPARTMENT VENT PATH DESCRIPTION
6.2-31	BLOWDOWN DATA (6-INCH RCIC HEAD SPRAY LINE BREAK DRYWELL HEAD SUBCOMPARTMENT)
6.2-32	SUBCOMPARTMENT NODAL DESCRIPTION
6.2-33	SUBCOMPARTMENT VENT PATH DESCRIPTION
6.2-34	BLOWDOWN DATA (24-INCH RECIRCULATION SUCTION LINE BREAK DRYWELL HEAD SUBCOMPARTMENT)
6.2-35	SUBCOMPARTMENT NODAL DESCRIPTION
6.2-36	SUBCOMPARTMENT VENT PATH DESCRIPTION

## NMP Unit 2 USAR

### CHAPTER 6

#### LIST OF TABLES (Cont'd)

<u>Table Number</u>	<u>Title</u>
6.2-37	BLOWDOWN DATA (12-INCH FEEDWATER LINE BREAK 21-NODE AND 37-NODE MODELS RPV-BSW ANNULUS)
6.2-38	SUBCOMPARTMENT NODAL DESCRIPTION
6.2-39	SUBCOMPARTMENT VENT PATH DESCRIPTION
6.2-40	SUBCOMPARTMENT NODAL DESCRIPTION
6.2-41	SUBCOMPARTMENT VENT PATH DESCRIPTION
6.2-42	BLOWDOWN DATA
6.2-43	SUBCOMPARTMENT NODAL DESCRIPTION
6.2-43A	SUBCOMPARTMENT VENT PATH DESCRIPTION
6.2-43B	BLOWDOWN DATA (10-INCH LOW-PRESSURE CORE SPRAY LINE BREAK RPV-BSW ANNULUS)
6.2-44	SUBCOMPARTMENT NODAL DESCRIPTION
6.2-44A	SUBCOMPARTMENT VENT PATH DESCRIPTION
6.2-44B	BLOWDOWN DATA (12-INCH RECIRCULATION INLET LINE BREAK RPV-BSW ANNULUS)
6.2-45	SUBCOMPARTMENT NODAL DESCRIPTION
6.2-45A	SUBCOMPARTMENT VENT PATH DESCRIPTION
6.2-45B	BLOWDOWN DATA (24-INCH RECIRCULATION SUCTION LINE BREAK RPV-BSW ANNULUS)
6.2-46	FORCE AND MOMENT SENSITIVITY STUDY SUMMARY
6.2-47	MAXIMUM FORCES AND MOMENTS ON THE BSW, FEEDWATER LINE BREAKS, RPV-BSW ANNULUS
6.2-48	PROJECTED AREAS AND MOMENT ARMS FOR FORCE AND MOMENT CALCULATIONS, 12-IN FEEDWATER LINE BREAK, 21-NODE MODEL, RPV-BSW ANNULUS
6.2-49	PROJECTED AREAS AND MOMENT ARMS FOR FORCE AND MOMENT CALCULATIONS, 12-IN FEEDWATER LINE BREAK, 37-NODE MODEL, RPV-BSW ANNULUS

## NMP Unit 2 USAR

### CHAPTER 6

#### LIST OF TABLES (Cont'd)

<u>Table Number</u>	<u>Title</u>
6.2-50	MASS AND ENERGY RELEASE DATA - OLTP ANALYSIS (MAIN STEAM LINE DER WITH FEEDWATER (CASE C))
6.2-51	CONTAINMENT SPRAY PARAMETERS
6.2-52	ACCIDENT ANALYSIS PARAMETERS USED FOR DBA OF CONTAINMENT HEAT REMOVAL (PRE-EPU ANALYSIS)
6.2-53	ENERGY/MASS BALANCE (STEAM BYPASS ANALYSIS)
6.2-54	SECONDARY CONTAINMENT DATA
6.2-55	DELETED
6.2-55a	EVALUATION OF POTENTIAL BYPASS LEAKAGE PATHS (ISOTHERMAL FLOW MODEL) - LOSS OF ONE DIESEL GENERATOR
6.2-55b	EVALUATION OF POTENTIAL BYPASS LEAKAGE PATHS (ISENTROPIC FLOW MODEL) - LOSS OF ONE DIESEL GENERATOR
6.2-55c	EVALUATION OF POTENTIAL BYPASS LEAKAGE PATHS (ISOTHERMAL FLOW MODEL - MSIV FAILURE)
6.2-55d	EVALUATION OF POTENTIAL BYPASS LEAKAGE PATHS (ISENTROPIC FLOW MODEL - MSIV FAILURE)
6.2-56	CONTAINMENT ISOLATION PROVISIONS FOR FLUID LINES
6.2-57	COMBUSTIBLE GAS CONTROL SYSTEM COMPONENT DESCRIPTION
6.2-58	GENERAL PARAMETERS USED IN CALCULATING POST-DBA OXYGEN/HYDROGEN CONCENTRATIONS
6.2-59	PLANT PARAMETERS USED IN POST-DBA COMBUSTIBLE GAS CONCENTRATION ANALYSIS
6.2-59A	HYDROGEN AND OXYGEN SAMPLING POINTS WITHIN PRIMARY CONTAINMENT
6.2-59B	STRUCTURES, PIPING, AND EQUIPMENT IN THE VICINITY OF HYDROGEN AND OXYGEN SAMPLING POINTS
6.2-59C	CORROSION RATES
6.2-59D	ALUMINUM AND ZINC INVENTORY EXPOSED TO SPRAYS

**NMP Unit 2 USAR**

CHAPTER 6

LIST OF TABLES (Cont'd)

<u>Table Number</u>	<u>Title</u>
6.2-60	PRIMARY CONTAINMENT LEAKAGE TESTING
6.2-61	SUPPRESSION POOL STEAM BYPASS LEAKAGE TESTS
6.2-62	SECONDARY CONTAINMENT ACCESS DOORS
6.2-63	CONTAINMENT PENETRATIONS WITH RELIEF VALVE DISCHARGE HEADERS
6.2-64	TYPE AND QUANTITY OF INSULATION USED IN DRYWELL
6.2-65	REVERSE TESTED CONTAINMENT ISOLATION VALVES
6.3-1	SIGNIFICANT INPUT VARIABLES USED IN THE SAFER/GESTR LOSS-OF-COOLANT ACCIDENT ANALYSIS
6.3-2	OPERATIONAL SEQUENCE OF EMERGENCY CORE COOLING SYSTEMS FOR SAFER/GESTR-LOCA ANALYSIS OF THE DESIGN BASIS ACCIDENT
6.3-3	SINGLE ACTIVE FAILURES CONSIDERED IN THE ECCS PERFORMANCE EVALUATION
6.3-4	MAPLHGR, MAXIMUM LOCAL OXIDATION, AND PEAK CLAD TEMPERATURE VERSUS EXPOSURE (INITIAL DBA LOCA ANALYSIS)
6.3-5	SUMMARY OF RESULTS OF SAFER/GESTR-LOCA ANALYSIS
6.3-6	KEY TO FIGURE NUMBERS
6.3-6a	KEY TO FIGURE NUMBERS
6.5-1	DESIGN DATA OF PRINCIPAL EQUIPMENT STANDBY GAS TREATMENT SYSTEM

## NMP Unit 2 USAR

### CHAPTER 6

#### LIST OF FIGURES

<u>Figure Number</u>	<u>Title</u>
6.2-1	RECIRCULATION PUMP SUCTION LINE BREAK SCHEMATIC
6.2-2	PRIMARY CONTAINMENT PRESSURE RECIRCULATION PUMP SUCTION LINE BREAK WITHOUT FEEDWATER, CASE C
6.2-3	PRIMARY CONTAINMENT PRESSURE RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE B
6.2-4	PRIMARY CONTAINMENT PRESSURE RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE C
6.2-4a	EPU PRIMARY CONTAINMENT PRESSURE RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE C - SHORT TERM RESPONSE
6.2-4b	EPU PRIMARY CONTAINMENT PRESSURE RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE C - LONG TERM RESPONSE
6.2-5	PRIMARY CONTAINMENT PRESSURE RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE A
6.2-6	PRIMARY CONTAINMENT TEMPERATURE RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE A
6.2-7	PRIMARY CONTAINMENT TEMPERATURE RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE B
6.2-8	PRIMARY CONTAINMENT TEMPERATURE RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE C
6.2-8a	EPU PRIMARY CONTAINMENT TEMPERATURE RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE C - SHORT TERM RESPONSE
6.2-8b	EPU PRIMARY CONTAINMENT TEMPERATURE RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE C - LONG TERM RESPONSE
6.2-9	PRIMARY CONTAINMENT TEMPERATURE RECIRCULATION PUMP SUCTION LINE BREAK WITHOUT FEEDWATER, CASE C
6.2-10	VENT SYSTEM MASS FLOW RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE C
6.2-11	SUPPRESSION POOL TEMPERATURE RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER

NMP Unit 2 USAR

CHAPTER 6

LIST OF FIGURES (Cont'd.)

<u>Figure Number</u>	<u>Title</u>
6.2-11a	EPU SUPPRESSION POOL TEMPERATURE RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER
6.2-12	RHR HEAT EXCHANGER HEAT REMOVAL RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER
6.2-12a	EPU RHR HEAT EXCHANGER REMOVAL RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE C
6.2-13	MAIN STEAM LINE BREAK SCHEMATIC
6.2-14	MAIN STEAM LINE BREAK AREA VS TIME
6.2-15	PRIMARY CONTAINMENT PRESSURE MAIN STEAM LINE BREAK WITH FEEDWATER, CASE A
6.2-16	PRIMARY CONTAINMENT PRESSURE MAIN STEAM LINE BREAK WITH FEEDWATER, CASE B
6.2-17	PRIMARY CONTAINMENT PRESSURE MAIN STEAM LINE BREAK WITH FEEDWATER, CASE C
6.2-18	PRIMARY CONTAINMENT PRESSURE MAIN STEAM LINE BREAK WITHOUT FEEDWATER, CASE C
6.2-19	PRIMARY CONTAINMENT TEMPERATURE MAIN STEAM LINE BREAK WITH FEEDWATER, CASE A
6.2-20	PRIMARY CONTAINMENT TEMPERATURE MAIN STEAM LINE BREAK WITH FEEDWATER, CASE B
6.2-21	PRIMARY CONTAINMENT TEMPERATURE MAIN STEAM LINE BREAK WITH FEEDWATER, CASE C
6.2-22	PRIMARY CONTAINMENT TEMPERATURE MAIN STEAM LINE BREAK WITHOUT FEEDWATER, CASE C
6.2-23	SUPPRESSION POOL TEMPERATURE MAIN STEAM LINE BREAK WITH FEEDWATER
6.2-24	DELETED
6.2-25	DELETED
6.2-26	DELETED
6.2-27	DELETED

## NMP Unit 2 USAR

### CHAPTER 6

#### LIST OF FIGURES (Cont'd.)

<u>Figure Number</u>	<u>Title</u>
6.2-28	MAXIMUM ALLOWABLE BYPASS CAPACITY ( $A/\sqrt{k}$ ) VERSUS STEAM LINE BREAK AREA
6.2-28A	LONG TERM STEAM BYPASS ANALYSIS
6.2-28B	HEAT SINK SURFACE HEAT TRANSFER COEFFICIENCY FOR LIMITING STEAM BYPASS CONDITION
6.2-28C	CONTAINMENT PRESSURE SENSITIVITY TO SPRAY THERMAL EFFICIENCY FOR LIMITING STEAM BYPASS CONDITION
6.2-29	HEAT TRANSFER COEFFICIENT RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE C
6.2-29A	LOCTVS COMPARISON TO PSTF RESULTS, POOL SURFACE VELOCITY VS SWELL HEIGHT, LIQUID BLOWDOWN
6.2-29B	LOCTVS COMPARISON TO PSTF RESULTS, POOL SURFACE ELEVATION VS TIME, LIQUID BLOWDOWN
6.2-29C	LOCTVS COMPARISON TO PSTF RESULTS, POOL SURFACE VELOCITY VS TIME, LIQUID BLOWDOWN
6.2-29D	LOCTVS COMPARISON TO PSTF RESULTS, WW AIR SPACE PRESSURE VS TIME, LIQUID BLOWDOWN
6.2-29E	LOCTVS COMPARISON TO PSTF RESULTS, BUBBLE PRESSURE VS TIME, LIQUID BLOWDOWN
6.2-29F	LOCTVS COMPARISON TO PSTF RESULTS, POOL SURFACE VELOCITY VS SWELL HEIGHT, STEAM BLOWDOWN
6.2-29G	LOCTVS COMPARISON TO PSTF RESULTS, POOL SURFACE ELEVATION VS TIME, STEAM BLOWDOWN
6.2-29H	LOCTVS COMPARISON TO PSTF RESULTS, POOL SURFACE VELOCITY VS TIME, STEAM BLOWDOWN
6.2-29I	LOCTVS COMPARISON TO PSTF RESULTS, WW AIR SPACE PRESSURE VS TIME, STEAM BLOWDOWN
6.2-29J	LOCTVS COMPARISON TO PSTF RESULTS, BUBBLE PRESSURE VS TIME, STEAM BLOWDOWN
6.2-30	DRYWELL HEAD-REFUELING BULKHEAD SKETCH

## NMP Unit 2 USAR

### CHAPTER 6

#### LIST OF FIGURES (Cont'd.)

<u>Figure Number</u>	<u>Title</u>
6.2-30A	REFUELING BULKHEAD VENT AREA
6.2-31	NODALIZATION DIAGRAM, RCIC HEAD SPRAY LINE BREAK, DRYWELL HEAD-DRYWELL SUBCOMPARTMENTS
6.2-31A	NODAL PRESSURES: RCIC HEAD SPRAY LINE BREAK, DRYWELL HEAD-DRYWELL SUBCOMPARTMENTS
6.2-31B	NODAL PRESSURE DIFFERENTIALS: RCIC HEAD SPRAY LINE BREAK, DRYWELL-DRYWELL HEAD SUBCOMPARTMENTS
6.2-32	NODALIZATION DIAGRAM, RECIRCULATION SUCTION LINE BREAK, DRYWELL HEAD-DRYWELL SUBCOMPARTMENTS
6.2-33A	NODAL PRESSURES: RECIRCULATION SUCTION LINE BREAK, DRYWELL HEAD-DRYWELL SUBCOMPARTMENTS
6.2-33B	NODAL PRESSURE DIFFERENTIALS: RECIRCULATION SUCTION LINE BREAK, DRYWELL-DRYWELL HEAD SUBCOMPARTMENTS
6.2-34	REACTOR VESSEL BLOWDOWN RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE C
6.2-34a	EPU REACTOR VESSEL BLOWDOWN RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE C
6.2-35	REACTOR VESSEL BLOWDOWN ENTHALPY RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE C
6.2-35a	EPU REACTOR VESSEL BLOWDOWN ENTHALPY RECIRCULATION PUMP SUCTION LINE BREAK WITH FEEDWATER, CASE C
6.2-36	REACTOR VESSEL BLOWDOWN MAIN STEAM LINE BREAK WITH FEEDWATER, CASE C
6.2-37	REACTOR VESSEL BLOWDOWN ENTHALPY MAIN STEAM BREAK WITH FEEDWATER, CASE C
6.2-38	CONTAINMENT ATMOSPHERE MONITORING SYSTEM LOGIC DIAGRAM (SHEETS 1 THROUGH 12)
6.2-39	SCHEMATIC OF CONTAINMENT SPRAY
6.2-39a	ECCS SUCTION STRAINER
6.2-40	TYPICAL LOOP A SPRAY COVERAGE IN DRYWELL

## NMP Unit 2 USAR

### CHAPTER 6

#### LIST OF FIGURES (Cont'd.)

<u>Figure Number</u>	<u>Title</u>
6.2-41	TYPICAL LOOP B SPRAY COVERAGE IN DRYWELL
6.2-42	APPROXIMATE SPRAY COVERAGE IN SUPPRESSION CHAMBER
6.2-43	APPROXIMATE VOLUME COVERAGE BY CONTAINMENT SPRAYS
6.2-44	DELETED
6.2-45	LONG TERM STEAM BYPASS ANALYSIS
6.2-46	RHR HEAT EXCHANGER HEAT REMOVAL RATES, LONG TERM STEAM BYPASS ANALYSIS
6.2-46A	DELETED
6.2-47	CONTAINMENT SPRAY FLOW RATE
6.2-48	HIGH PRESSURE CORE SPRAY FLOW RATE
6.2-49	LOW PRESSURE CORE SPRAY FLOW RATE
6.2-50	LOW PRESSURE COOLANT INJECTION FLOW RATE
6.2-51	RECIRCULATION PUMP SUCTION LINE BREAK AREA VS TIME
6.2-52	NODALIZATION DIAGRAM, FEEDWATER LINE BREAK, 21-NODE MODEL, RPV-BSW ANNULUS
6.2-53	NODAL PRESSURES, FEEDWATER LINE BREAK, 21-NODE MODEL, RPV-BSW ANNULUS (SHEETS 1 THROUGH 6)
6.2-54	NODAL PRESSURE DIFFERENTIALS, FEEDWATER LINE BREAK, 21-NODE MODEL, RPV-BSW ANNULUS
6.2-55	NODALIZATION DIAGRAM, FEEDWATER LINE BREAK, 37-NODE MODEL, RPV-BSW ANNULUS
6.2-56	NODAL PRESSURES, FEEDWATER LINE BREAK, 37-NODE MODEL, RPV-BSW ANNULUS (SHEETS 1 THROUGH 10)
6.2-57	NODAL PRESSURE DIFFERENTIALS, FEEDWATER LINE BREAK, 37-NODE MODEL, RPV-BSW ANNULUS
6.2-58	NODALIZATION DIAGRAM, LOW PRESSURE COOLANT INJECTION LINE BREAK, RPV-BSW ANNULUS
6.2-59	NODAL PRESSURES, LOW PRESSURE COOLANT INJECTION LINE BREAK, RPV-BSW ANNULUS (SHEETS 1 THROUGH 5)

## NMP Unit 2 USAR

### CHAPTER 6

#### LIST OF FIGURES (Cont'd.)

<u>Figure Number</u>	<u>Title</u>
6.2-60	NODAL PRESSURE DIFFERENTIALS, LOW PRESSURE COOLANT INJECTION LINE BREAK, RPV-BSW ANNULUS
6.2-61	NODALIZATION DIAGRAM, LOW PRESSURE CORE SPRAY LINE BREAK, RPV-BSW ANNULUS
6.2-62	NODAL PRESSURES, LOW PRESSURE CORE SPRAY LINE BREAK, RPV-BSW ANNULUS (SHEETS 1 THROUGH 5)
6.2-62A	NODAL PRESSURE DIFFERENTIALS, LOW PRESSURE CORE SPRAY LINE BREAK, RPV-BSW ANNULUS
6.2-63	NODALIZATION DIAGRAM, RECIRCULATION INLET LINE BREAK, RPV-BSW ANNULUS
6.2-64	NODAL PRESSURES, RECIRCULATION INLET LINE BREAK, RPV-BSW ANNULUS (SHEETS 1 THROUGH 5)
6.2-64A	NODAL PRESSURE DIFFERENTIALS, RECIRCULATION INLET LINE BREAK, RPV-BSW ANNULUS
6.2-65	NODALIZATION DIAGRAM, RECIRCULATION SUCTION LINE BREAK, RPV-BSW ANNULUS
6.2-66	NODAL PRESSURES, RECIRCULATION SUCTION LINE BREAK, RPV-BSW ANNULUS (SHEETS 1 THROUGH 6)
6.2-66A	NODAL PRESSURE DIFFERENTIALS, RECIRCULATION SUCTION LINE BREAK, RPV-BSW ANNULUS
6.2-67	ANNULUS PRESSURIZATION GEOMETRY FOR FORCE AND MOMENT CALCULATIONS, FEEDWATER LINE BREAKS, RPV-BSW ANNULUS
6.2-68	VECTOR SUM OF HALF-ANNULUS FORCES ACTING ON BSW, FEEDWATER LINE BREAK, 21-NODE MODEL, RPV-BSW ANNULUS
6.2-68A	VECTOR SUM OF HALF-ANNULUS FORCES ACTING ON BSW, FEEDWATER LINE BREAK, 37-NODE MODEL, RPV-BSW ANNULUS
6.2-69	VECTOR SUM OF HALF-ANNULUS MOMENTS ACTING ON BSW, FEEDWATER LINE BREAK, 21-NODE MODEL, RPV-BSW ANNULUS

## NMP Unit 2 USAR

### CHAPTER 6

#### LIST OF FIGURES (Cont'd.)

<u>Figure Number</u>	<u>Title</u>
6.2-69A	VECTOR SUM OF HALF-ANNULUS MOMENTS ACTING ON BSW, FEEDWATER LINE BREAK, 37-NODE MODEL, RPV-BSW ANNULUS
6.2-70	ISOLATION VALVE ARRANGEMENT FOR PENETRATION Z-31A, B, C, D, E
6.2-70a	ISOLATION VALVE ARRANGEMENT FOR INSTRUMENT LINES
6.2-71	CONTAINMENT ATMOSPHERE MONITORING SYSTEM (SHEETS A AND B)
6.2-72	DBA HYDROGEN RECOMBINER SYSTEM (SHEETS A AND B)
6.2-72C	DELETED
6.2-72D	HYDROGEN GENERATION RATES FOLLOWING A DESIGN BASIS ACCIDENT (DBA)
6.2-72E	INTEGRATED HYDROGEN GENERATION FOLLOWING DBA
6.2-72F	DELETED
6.2-72G	DELETED
6.2-72H	OXYGEN CONCENTRATIONS FOLLOWING A DESIGN BASIS ACCIDENT (DBA)
6.2-72I	HYDROGEN CONCENTRATIONS FOLLOWING A DESIGN BASIS ACCIDENT (DBA)
6.2-72J	DELETED
6.2-72K	COMBUSTIBLE GAS CONTROL SYSTEM LOGIC DIAGRAM (SHEETS 1 THROUGH 5)
6.2-73a	CONTAINMENT LEAKAGE MONITORING SYSTEM
6.2-74	DELETED
6.2-75	N <sub>2</sub> PURGE PENETRATION
6.2.75a	TRAVERSING IN-CORE PROBE MID-SPAN SINGLE O-RING FLANGE OF 2NMT*EJ1B AT 2NMT*Z31B PENETRATION
6.2-75b	TRAVERSING IN-CORE PROBE 2NMT*Z31A, B, C, D, & E PENETRATIONS

**NMP Unit 2 USAR**

CHAPTER 6

LIST OF FIGURES (Cont'd.)

<u>Figure Number</u>	<u>Title</u>
6.2-76	DELETED
6.2-77	EFFECT OF OUTSIDE AIR TEMPERATURE ON THE MINIMUM REQUIRED DRAWDOWN DIFFERENTIAL TEMPERATURE
6.2-78	SGTS FAN PERFORMANCE CURVE
6.2-79	DELETED
6.2-80	DELETED
6.2-81	RCIC PUMP SUCTION FROM SUPPRESSION POOL
6.2-82	DELETED
6.2-83	HPCS PUMP SUCTION FROM SUPPRESSION POOL
6.2-84	FEEDWATER LINES (FWS) TO REACTOR PRESSURE VESSEL
6.2-85	NITROGEN SYSTEM LINES TO REACTOR BUILDING INSTRUMENT AIR RECEIVER TANK
6.2-86	DELETED
6.2-87	NMP2 - RHR SUCTION AND DISCHARGE SCHEMATIC (PLAN)
6.2-88	TYPICAL WATER LOOP SEAL
6.2-89	DRYWELL PRESSURE DECAY TRANSIENT FOR HIGH PRESSURE STEAM BYPASS TEST
6.2-90	DRYWELL PRESSURE DECAY TRANSIENT FOR LOW PRESSURE STEAM BYPASS TEST
6.2-91	SPRAY PATTERNS AND PARTICLE SIZE
6.2-92	RHR SUPPRESSION CHAMBER SPRAY HEADER, AND SPRAY NOZZLE LOCATIONS
6.2-93	RHR DRYWELL SPRAY HEADERS
6.2-94	SPRAY NOZZLE LOCATIONS FOR DRYWELL SPRAY HEADERS
6.2.95A	CORRECTION FACTOR FOR INLEAKAGE AT 0.25 INCHES WG
6.2.95B	CORRECTION FACTOR FOR FLOW METER READING
6.2.95C	DRAWDOWN TIME VS CORRECTED IN-LEAKAGE FLOW

## NMP Unit 2 USAR

### CHAPTER 6

#### LIST OF FIGURES (Cont'd.)

<u>Figure Number</u>	<u>Title</u>
6.2.95D	CORRECTION FACTOR FOR INLEAKAGE AT -20°F OUTSIDE AIR & 105°F REACTOR BUILDING AIR
6.3-1	HIGH PRESSURE CORE SPRAY PROCESS DIAGRAM (SHEETS 1 AND 2)
6.3-2	LOW PRESSURE CORE SPRAY SYSTEM PROCESS DIAGRAM
6.3-3a	HEAD VERSUS HIGH PRESSURE CORE SPRAY FLOW USED IN LOCA ANALYSIS
6.3-3b	HIGH PRESSURE CORE SPRAY PUMP CHARACTERISTICS
6.3-4a	HEAD VERSUS LOW PRESSURE CORE SPRAY FLOW USED IN LOCA ANALYSIS
6.3-4b	LOW PRESSURE CORE SPRAY PUMP CHARACTERISTICS
6.3-5a	HEAD VERSUS LOW PRESSURE COOLANT INJECTION FLOW USED IN LOCA ANALYSIS
6.3-5b	RHR (LPCI) PUMP CHARACTERISTICS
6.3-5c	COMPARISON OF PEAK CLADDING TEMPERATURE VS TIME FOR LOCA ANALYSIS WITH AND WITHOUT FLOW CONTROL VALVE CLOSURE
6.3-6	HIGH PRESSURE CORE SPRAY SYSTEM (SHEETS A AND B)
6.3-7a	LOW PRESSURE CORE SPRAY
6.3-8	PEAK CLADDING TEMPERATURE AND PEAK LOCAL OXIDATION VERSUS BREAK AREA
6.3-9	NORMALIZED CORE POWER VERSUS TIME FOR LOSS-OF-COOLANT ACCIDENT ANALYSIS
6.3-10	TOTAL TIME FOR WHICH HIGHEST POWERED NODE REMAINS UNCOVERED VERSUS BREAK AREA, LPCS DIESEL GENERATOR FAILURE
6.3-11	CORE AVERAGE PRESSURE FOLLOWING A DESIGN BASIS ACCIDENT RECIRCULATION SUCTION BREAK, LPCS DIESEL GENERATOR FAILURE

## NMP Unit 2 USAR

### CHAPTER 6

#### LIST OF FIGURES (Cont'd.)

<u>Figure Number</u>	<u>Title</u>
6.3-12	NORMALIZED CORE AVERAGE INLET FLOW FOLLOWING A DESIGN BASIS ACCIDENT RECIRCULATION SUCTION BREAK, LPCS DIESEL GENERATOR FAILURE
6.3-13	CORE INLET ENTHALPY FOLLOWING A DESIGN BASIS ACCIDENT RECIRCULATION SUCTION BREAK, LPCS DIESEL GENERATOR FAILURE
6.3-14	MINIMUM CRITICAL POWER RATIO FOLLOWING A DESIGN BASIS ACCIDENT RECIRCULATION SUCTION BREAK, LPCS DIESEL GENERATOR FAILURE
6.3-15	WATER LEVEL INSIDE SHROUD FOLLOWING A DESIGN BASIS ACCIDENT RECIRCULATION SUCTION BREAK, LPCS DIESEL GENERATOR FAILURE
6.3-16	REACTOR VESSEL PRESSURE FOLLOWING A DESIGN BASIS ACCIDENT RECIRCULATION SUCTION BREAK, LPCS DIESEL GENERATOR FAILURE
6.3-17	FUEL ROD CONVECTIVE HEAT TRANSFER COEFFICIENT DURING BLOWDOWN AT THE HIGH POWER AXIAL NODE FOLLOWING A DESIGN BASIS ACCIDENT RECIRCULATION SUCTION BREAK, LPCS DIESEL GENERATOR FAILURE
6.3-18	PEAK CLADDING TEMPERATURE FOLLOWING A DESIGN BASIS ACCIDENT RECIRCULATION SUCTION BREAK, LPCS DIESEL GENERATOR FAILURE
6.3-19	AVERAGE FUEL TEMPERATURE FOLLOWING A DESIGN BASIS ACCIDENT RECIRCULATION SUCTION BREAK, LPCS DIESEL GENERATOR FAILURE
6.3-20	PCT ROD INTERNAL PRESSURE FOLLOWING A DESIGN BASIS ACCIDENT RECIRCULATION SUCTION BREAK, LPCS DIESEL GENERATOR FAILURE
6.3-21	CORE AVERAGE PRESSURE FOLLOWING A 1.0 SQ FT BREAK (LBM) RECIRCULATION SUCTION BREAK, HPCS FAILURE
6.3-22	NORMALIZED CORE AVERAGE INLET FLOW FOLLOWING A 1.0 SQ FT BREAK (LBM) RECIRCULATION SUCTION BREAK, HPCS FAILURE
6.3-23	CORE INLET ENTHALPY FOLLOWING A 1.0 SQ FT BREAK (LBM) RECIRCULATION SUCTION BREAK, HPCS FAILURE

## NMP Unit 2 USAR

### CHAPTER 6

#### LIST OF FIGURES (Cont'd.)

<u>Figure Number</u>	<u>Title</u>
6.3-24	MINIMUM CRITICAL POWER RATIO FOLLOWING A 1.0 SQ FT BREAK (LBM) RECIRCULATION SUCTION BREAK, HPCS FAILURE
6.3-25	WATER LEVEL INSIDE SHROUD FOLLOWING A 1.0 SQ FT BREAK (LBM) RECIRCULATION SUCTION BREAK, HPCS FAILURE
6.3-26	REACTOR VESSEL PRESSURE FOLLOWING A 1.0 SQ FT BREAK (LBM) RECIRCULATION SUCTION BREAK, HPCS FAILURE
6.3-27	FUEL ROD CONVECTIVE HEAT TRANSFER COEFFICIENT DURING BLOWDOWN AT THE HIGH POWER AXIAL NODE FOLLOWING A 1.0 SQ FT BREAK (LBM) RECIRCULATION SUCTION BREAK, HPCS FAILURE
6.3-28	PEAK CLADDING TEMPERATURE FOLLOWING A 1.0 SQ FT BREAK (LBM) RECIRCULATION SUCTION BREAK, HPCS FAILURE
6.3-29	WATER LEVEL INSIDE SHROUD FOLLOWING A 1.0 SQ FT BREAK (SBM) RECIRCULATION SUCTION BREAK, HPCS FAILURE
6.3-30	REACTOR VESSEL PRESSURE FOLLOWING A 1.0 SQ FT BREAK (SBM) RECIRCULATION SUCTION BREAK, HPCS FAILURE
6.3-31	FUEL ROD CONVECTIVE HEAT TRANSFER COEFFICIENT FOLLOWING A 1.0 SQ FT BREAK (SBM) RECIRCULATION SUCTION BREAK, HPCS FAILURE
6.3-32	PEAK CLADDING TEMPERATURE FOLLOWING A 1.0 SQ FT BREAK (SBM) RECIRCULATION SUCTION BREAK, HPCS FAILURE
6.3-33	WATER LEVEL INSIDE SHROUD FOLLOWING A 0.09 SQ FT BREAK (HIGHEST TEMPERATURE SMALL BREAK) RECIRCULATION SUCTION BREAK, HPCS FAILURE
6.3-34	REACTOR VESSEL PRESSURE FOLLOWING A 0.09 SQ FT BREAK (HIGHEST TEMPERATURE SMALL BREAK) RECIRCULATION SUCTION BREAK, HPCS FAILURE
6.3-35	FUEL ROD CONVECTIVE HEAT TRANSFER COEFFICIENT FOLLOWING A 0.09 SQ FT BREAK (HIGHEST TEMPERATURE SMALL BREAK) RECIRC. SUCTION BREAK, HPCS FAILURE

NMP Unit 2 USAR

CHAPTER 6

LIST OF FIGURES (Cont'd.)

<u>Figure Number</u>	<u>Title</u>
6.3-36	PEAK CLADDING TEMPERATURE FOLLOWING A 0.09 SQ FT BREAK (HIGHEST TEMPERATURE SMALL BREAK) RECIRCULATION SUCTION BREAK, HPCS FAILURE
6.3-37	DELETED
6.3-38	DELETED
6.3-39	DELETED
6.3-40	DELETED
6.3-41	WATER LEVEL INSIDE SHROUD FOLLOWING A MAXIMUM HPCS LINE BREAK, LPCS DIESEL GENERATOR FAILURE
6.3-42	REACTOR VESSEL PRESSURE FOLLOWING A MAXIMUM HPCS LINE BREAK, LPCS DIESEL GENERATOR FAILURE
6.3-43	FUEL ROD CONVECTIVE HEAT TRANSFER COEFFICIENT FOLLOWING A MAXIMUM HPCS LINE BREAK, LPCS DIESEL GENERATOR FAILURE
6.3-44	PEAK CLADDING TEMPERATURE FOLLOWING A MAXIMUM HPCS LINE BREAK, LPCS DIESEL GENERATOR FAILURE
6.3-45	WATER LEVEL INSIDE SHROUD FOLLOWING A MAXIMUM FEEDWATER LINE BREAK, HPCS FAILURE
6.3-46	REACTOR VESSEL PRESSURE FOLLOWING A MAXIMUM FEEDWATER LINE BREAK, HPCS FAILURE
6.3-47	FUEL ROD CONVECTIVE HEAT TRANSFER COEFFICIENT FOLLOWING A MAXIMUM FEEDWATER LINE BREAK, HPCS FAILURE
6.3-48	PEAK CLADDING TEMPERATURE FOLLOWING A MAXIMUM FEEDWATER LINE BREAK, HPCS FAILURE
6.3-49	WATER LEVEL INSIDE SHROUD FOLLOWING A MAXIMUM MAIN STEAM LINE BREAK INSIDE CONTAINMENT, LPCI DIESEL GENERATOR FAILURE
6.3-50	REACTOR VESSEL PRESSURE FOLLOWING A MAXIMUM MAIN STEAM LINE BREAK INSIDE CONTAINMENT, LPCI DIESEL GENERATOR FAILURE

NMP Unit 2 USAR

CHAPTER 6

LIST OF FIGURES (Cont'd.)

<u>Figure Number</u>	<u>Title</u>
6.3-51	FUEL ROD CONVECTIVE HEAT TRANSFER COEFFICIENT FOLLOWING A MAXIMUM MAIN STEAM LINE BREAK INSIDE CONTAINMENT, LPCI DIESEL GENERATOR FAILURE
6.3-52	PEAK CLADDING TEMPERATURE FOLLOWING A MAXIMUM MAIN STEAM LINE BREAK INSIDE CONTAINMENT, LPCI DIESEL GENERATOR FAILURE
6.3-53	WATER LEVEL INSIDE SHROUD FOLLOWING A MAXIMUM MAIN STEAM LINE BREAK OUTSIDE CONTAINMENT, HPCS FAILURE
6.3-54	REACTOR VESSEL PRESSURE FOLLOWING A MAXIMUM MAIN STEAM LINE BREAK OUTSIDE CONTAINMENT, HPCS FAILURE
6.3-55	FUEL ROD CONVECTIVE HEAT TRANSFER COEFFICIENT FOLLOWING A MAXIMUM MAIN STEAM LINE BREAK OUTSIDE CONTAINMENT, HPCS FAILURE
6.3-56	PEAK CLADDING TEMPERATURE FOLLOWING A MAXIMUM MAIN STEAM LINE BREAK OUTSIDE CONTAINMENT, HPCS FAILURE
6.3-57	NMP-2 DBA-HPCS DG FAILURE-APPENDIX K, HOT AND AVERAGE CHANNEL WATER LEVEL
6.3-58	NMP-2 DBA-HPCS DG FAILURE-APPENDIX K, REACTOR VESSEL PRESSURE
6.3-59	NMP-2 DBA-HPCS DG FAILURE-APPENDIX K, HEAT TRANSFER COEFFICIENT
6.3-60	NMP-2 DBA-HPCS DG FAILURE-APPENDIX K, PEAK CLADDING TEMPERATURE
6.3-61	NMP-2 0.07 FT <sup>2</sup> -HPCS DG FAILURE-APPENDIX K, HOT AND AVERAGE CHANNEL WATER LEVEL
6.3-62	NMP-2 0.07 FT <sup>2</sup> -HPCS DG FAILURE-APPENDIX K, REACTOR VESSEL PRESSURE
6.3-63	NMP-2 0.07 FT <sup>2</sup> -HPCS DG FAILURE-APPENDIX K, HEAT TRANSFER COEFFICIENT
6.3-64	NMP-2 0.07 FT <sup>2</sup> -HPCS DG FAILURE-APPENDIX K, PEAK CLADDING TEMPERATURE
6.5-1	STANDBY GAS TREATMENT SYSTEM LOGIC DIAGRAM (SHEETS 1 THROUGH 8)