

CHAPTER 14
SAFETY ANALYSIS
TABLE OF CONTENTS

| | | <u>PAGE</u> |
|-------------|---|--------------------|
| 14.0 | <u>SAFETY ANALYSIS</u> | 14.1-1 |
| 14.1 | <u>ORGANIZATION AND METHODOLOGY</u> | 14.1-1 |
| 14.1.1 | CLASSIFICATION OF TRANSIENTS AND ACCIDENTS | 14.1-1 |
| 14.1.1.1 | <u>Categorization</u> | 14.1-1 |
| 14.1.1.2 | <u>Acceptance Criteria</u> | 14.1-2 |
| 14.1.1.3 | <u>Section Numbering</u> | 14.1-3 |
| 14.1.2 | PLANT CHARACTERISTICS CONSIDERED IN SAFETY ANALYSIS | 14.1-3 |
| 14.1.2.1 | <u>Initial Conditions</u> | 14.1-3 |
| 14.1.2.2 | <u>Input Parameters</u> | 14.1-3 |
| 14.1.3 | ASSUMED PROTECTION SYSTEM ACTIONS | 14.1-5 |
| 14.1.3.1 | <u>Sequence of Events and Systems Operation</u> | 14.1-5 |
| 14.1.3.2 | <u>Protection System Setpoints</u> | 14.1-5 |
| 14.1.3.3 | <u>Control System Operational Status</u> | 14.1-6 |
| 14.1.4 | CORE AND SYSTEM PERFORMANCE | 14.1-6 |
| 14.1.4.1 | <u>Mathematical Models</u> | 14.1-6 |
| 14.1.4.2 | <u>Operator Action Requirement</u> | 14.1-14 |
| 14.1.4.3 | <u>Activity Release Methodology</u> | 14.1-15 |
| 14.1.4.4 | <u>Fuel Performance Models and Acceptance Criteria</u> | 14.1-17 |
| 14.1.5 | REFERENCES | 14.1-19 |
| 14.2 | <u>CONTROL ELEMENT ASSEMBLY WITHDRAWAL EVENT</u> | 14.2-1 |
| 14.2.1 | IDENTIFICATION OF EVENT AND CAUSE | 14.2-1 |
| 14.2.2 | SEQUENCE OF EVENTS | 14.2-1 |
| 14.2.2.1 | <u>Zero Power Case</u> | 14.2-2 |
| 14.2.2.2 | <u>Full Power Case</u> | 14.2-3 |
| 14.2.3 | CORE AND SYSTEM PERFORMANCE | 14.2-4 |
| 14.2.3.1 | <u>Mathematical Models</u> | 14.2-4 |
| 14.2.3.2 | <u>Input Parameters and Initial Conditions</u> | 14.2-4 |
| 14.2.3.3 | <u>Results</u> | 14.2-5 |
| 14.2.4 | CONCLUSIONS | 14.2-6 |
| 14.2.5 | REFERENCES | 14.2-6 |
| 14.3 | <u>BORON DILUTION EVENT</u> | 14.3-1 |
| 14.3.1 | IDENTIFICATION OF EVENT AND CAUSE | 14.3-1 |
| 14.3.2 | SEQUENCE OF EVENTS | 14.3-1 |
| 14.3.2.1 | <u>Power Operation and Startup</u> | 14.3-2 |
| 14.3.2.2 | <u>Hot Standby, Hot Shutdown</u> | 14.3-2 |
| 14.3.2.3 | <u>Cold Shutdown</u> | 14.3-2 |
| 14.3.2.4 | <u>Refueling</u> | 14.3-2 |

CHAPTER 14
SAFETY ANALYSIS

TABLE OF CONTENTS

| | <u>PAGE</u> | |
|-------------|---|--------|
| 14.3.3 | CORE AND SYSTEM PERFORMANCE | 14.3-3 |
| 14.3.3.1 | <u>Mathematical Models</u> | 14.3-3 |
| 14.3.3.2 | <u>Input Parameters and Initial Conditions</u> | 14.3-3 |
| 14.3.3.3 | <u>Results</u> | 14.3-4 |
| 14.3.4 | CONCLUSION | 14.3-4 |
| 14.3.5 | NRC ACCEPTANCE LIMIT | 14.3-4 |
| 14.3.6 | REFERENCES | 14.3-4 |
| 14.4 | <u>EXCESS LOAD EVENT</u> | 14.4-1 |
| 14.4.1 | IDENTIFICATION OF EVENT AND CAUSE | 14.4-1 |
| 14.4.2 | SEQUENCE OF EVENTS | 14.4-1 |
| 14.4.2.1 | <u>Zero Power Case</u> | 14.4-1 |
| 14.4.2.2 | <u>Full Power Case</u> | 14.4-3 |
| 14.4.3 | CORE AND SYSTEM PERFORMANCE | 14.4-4 |
| 14.4.3.1 | <u>Mathematical Models</u> | 14.4-4 |
| 14.4.3.2 | <u>Input Parameters and Initial Conditions</u> | 14.4-4 |
| 14.4.3.3 | <u>Results</u> | 14.4-5 |
| 14.4.4 | CONCLUSION | 14.4-6 |
| 14.4.5 | REFERENCES | 14.4-6 |
| 14.5 | <u>LOSS OF LOAD EVENT</u> | 14.5-1 |
| 14.5.1 | IDENTIFICATION OF EVENT AND CAUSE | 14.5-1 |
| 14.5.2 | SEQUENCE OF EVENTS | 14.5-1 |
| 14.5.3 | CORE AND SYSTEM PERFORMANCE | 14.5-2 |
| 14.5.3.1 | <u>Mathematical Models</u> | 14.5-2 |
| 14.5.3.2 | <u>Input Parameters and Initial Conditions</u> | 14.5-2 |
| 14.5.3.3 | <u>Results</u> | 14.5-2 |
| 14.5.4 | CONCLUSIONS | 14.5-3 |
| 14.6 | <u>LOSS OF FEEDWATER FLOW EVENT</u> | 14.6-1 |
| 14.6.1 | IDENTIFICATION OF EVENT AND CAUSE | 14.6-1 |
| 14.6.2 | SEQUENCE OF EVENTS | 14.6-1 |
| 14.6.3 | CORE AND SYSTEM PERFORMANCE | 14.6-2 |
| 14.6.3.1 | <u>Mathematical Models</u> | 14.6-2 |
| 14.6.3.2 | <u>Input Parameters and Initial Conditions</u> | 14.6-3 |
| 14.6.3.3 | <u>Results</u> | 14.6-3 |
| 14.6.4 | CONCLUSIONS | 14.6-4 |
| 14.7 | <u>EXCESS FEEDWATER HEAT REMOVAL EVENT</u> | 14.7-1 |
| 14.7.1 | INTRODUCTION | 14.7-1 |
| 14.7.2 | PHYSICAL DESCRIPTION OF EVENT | 14.7-1 |
| 14.7.3 | METHODOLOGY | 14.7-1 |
| 14.7.4 | INPUTS AND ASSUMPTIONS | 14.7-2 |

CHAPTER 14
SAFETY ANALYSIS
TABLE OF CONTENTS

| | | <u>PAGE</u> |
|--------------|--|--------------------|
| | 14.7.5 RESULTS | 14.7-2 |
| | 14.7.6 CONCLUSIONS | 14.7-2 |
| 14.8 | <u>REACTOR COOLANT SYSTEM DEPRESSURIZATION</u> | 14.8-1 |
| | 14.8.1 IDENTIFICATION OF EVENT AND CAUSE | 14.8-1 |
| | 14.8.2 SEQUENCE OF EVENTS | 14.8-1 |
| | 14.8.3 CORE AND SYSTEM PERFORMANCE | 14.8-2 |
| | 14.8.3.1 <u>Mathematical Models</u> | 14.8-2 |
| | 14.8.3.2 <u>Input Parameters and Initial Conditions</u> | 14.8-2 |
| | 14.8.3.3 <u>Results</u> | 14.8-2 |
| | 14.8.4 CONCLUSION | 14.8-2 |
| | 14.8.5 REFERENCES | 14.8-3 |
| 14.9 | <u>LOSS-OF-COOLANT FLOW EVENT</u> | 14.9-1 |
| | 14.9.1 IDENTIFICATION OF EVENT AND CAUSE | 14.9-1 |
| | 14.9.2 SEQUENCE OF EVENTS | 14.9-1 |
| | 14.9.3 CORE AND SYSTEM PERFORMANCE | 14.9-2 |
| | 14.9.3.1 <u>Mathematical Models</u> | 14.9-2 |
| | 14.9.3.2 <u>Input Parameters and Initial Conditions</u> | 14.9-2 |
| | 14.9.3.3 <u>Results</u> | 14.9-2 |
| | 14.9.4 CONCLUSION | 14.9-3 |
| | 14.9.5 REFERENCES | 14.9-3 |
| 14.10 | <u>LOSS-OF-NON-EMERGENCY AC POWER</u> | 14.10-1 |
| | 14.10.1 IDENTIFICATION OF EVENT AND CAUSE | 14.10-1 |
| | 14.10.2 SEQUENCE OF EVENTS | 14.10-1 |
| | 14.10.3 CORE AND SYSTEM PERFORMANCE | 14.10-2 |
| | 14.10.3.1 <u>Mathematical Models</u> | 14.10-2 |
| | 14.10.3.2 <u>Input Parameters and Initial Conditions</u> | 14.10-3 |
| | 14.10.3.3 <u>Results</u> | 14.10-3 |
| | 14.10.4 CONCLUSION | 14.10-3 |
| 14.11 | <u>CONTROL ELEMENT ASSEMBLY DROP EVENT</u> | 14.11-1 |
| | 14.11.1 IDENTIFICATION OF EVENT AND CAUSE | 14.11-1 |
| | 14.11.2 SEQUENCE OF EVENTS | 14.11-1 |
| | 14.11.3 CORE AND SYSTEM PERFORMANCE | 14.11-2 |
| | 14.11.3.1 <u>Mathematical Models</u> | 14.11-2 |
| | 14.11.3.2 <u>Input Parameters and Initial Conditions</u> | 14.11-2 |
| | 14.11.3.3 <u>Results</u> | 14.11-3 |
| | 14.11.4 CONCLUSION | 14.11-3 |
| | 14.11.5 REFERENCES | 14.11-3 |
| 14.12 | <u>ASYMMETRIC STEAM GENERATOR EVENT</u> | 14.12-1 |
| | 14.12.1 IDENTIFICATION OF EVENT AND CAUSE | 14.12-1 |

CHAPTER 14
SAFETY ANALYSIS
TABLE OF CONTENTS

| | | <u>PAGE</u> |
|--------------|--|--------------------|
| 14.12.2 | SEQUENCE OF EVENTS | 14.12-1 |
| 14.12.2.1 | <u>Asymmetric Excess Feedwater</u> | 14.12-1 |
| 14.12.2.2 | <u>Asymmetric Loss of Feedwater</u> | 14.12-1 |
| 14.12.2.3 | <u>Asymmetric Excess Load</u> | 14.12-2 |
| 14.12.2.4 | <u>Asymmetric Loss of Load</u> | 14.12-2 |
| 14.12.3 | CORE AND SYSTEM PERFORMANCE | 14.12-3 |
| 14.12.3.1 | <u>Mathematical Models</u> | 14.12-3 |
| 14.12.3.2 | <u>Input Parameters and Initial Conditions</u> | 14.12-3 |
| 14.12.3.3 | <u>Results</u> | 14.12-3 |
| 14.12.4 | CONCLUSION | 14.12-4 |
| 14.12.5 | REFERENCES | 14.12-4 |
| 14.13 | <u>CONTROL ELEMENT ASSEMBLY EJECTION</u> | 14.13-1 |
| 14.13.1 | IDENTIFICATION OF EVENT AND CAUSE | 14.13-1 |
| 14.13.2 | SEQUENCE OF EVENTS | 14.13-1 |
| 14.13.2.1 | <u>Zero Power Case</u> | 14.13-1 |
| 14.13.2.2 | <u>Full Power Case</u> | 14.13-1 |
| 14.13.3 | CORE AND SYSTEM PERFORMANCE | 14.13-2 |
| 14.13.3.1 | <u>Mathematical Models</u> | 14.13-2 |
| 14.13.3.2 | <u>Input Parameters and Initial Conditions</u> | 14.13-3 |
| 14.13.3.3 | <u>Results</u> | 14.13-3 |
| 14.13.4 | DOSE ANALYSIS | 14.13-4 |
| 14.13.5 | CONCLUSION | 14.13-5 |
| 14.13.6 | REFERENCES | 14.13-6 |
| 14.14 | <u>STEAM LINE BREAK EVENT</u> | 14.14-1 |
| 14.14.1 | IDENTIFICATION OF EVENT AND CAUSE | 14.14-1 |
| 14.14.2 | DISCUSSION OF MAIN STEAM ISOLATION VALVE TESTING | 14.14-1 |
| 14.14.3 | SEQUENCE OF EVENTS | 14.14-3 |
| 14.14.4 | CORE AND SYSTEM PERFORMANCE | 14.14-5 |
| 14.14.4.1 | <u>Mathematical Models</u> | 14.14-5 |
| 14.14.4.2 | <u>Input Parameters and Initial Conditions</u> | 14.14-5 |
| 14.14.4.3 | <u>Results</u> | 14.14-9 |
| 14.14.5 | CONCLUSIONS | 14.14-10 |
| 14.14.6 | REFERENCES | 14.14-10 |
| 14.15 | <u>STEAM GENERATOR TUBE RUPTURE EVENT</u> | 14.15-1 |
| 14.15.1 | IDENTIFICATION OF EVENT AND CAUSES | 14.15-1 |
| 14.15.2 | SEQUENCE OF EVENTS AND SYSTEMS OPERATION | 14.15-2 |
| 14.15.3 | ANALYSIS OF EFFECTS AND CONSEQUENCES | 14.15-4 |
| 14.15.3.1 | <u>Core and System Performance</u> | 14.15-4 |
| 14.15.3.2 | <u>Radiological Consequences</u> | 14.15-6 |

CHAPTER 14
SAFETY ANALYSIS

TABLE OF CONTENTS

| | <u>PAGE</u> |
|---|--------------------|
| 14.15.4 CONCLUSION | 14.15-9 |
| 14.15.5 REFERENCES | 14.15-9 |
| 14.16 <u>SEIZED ROTOR EVENT</u> | 14.16-1 |
| 14.16.1 IDENTIFICATION OF EVENT AND CAUSE | 14.16-1 |
| 14.16.2 SEQUENCE OF EVENTS | 14.16-1 |
| 14.16.3 CORE AND SYSTEM PERFORMANCE | 14.16-2 |
| 14.16.3.1 <u>Mathematical Models</u> | 14.16-2 |
| 14.16.3.2 <u>Input Parameters and Initial Conditions</u> | 14.16-2 |
| 14.16.3.3 <u>Results</u> | 14.16-2 |
| 14.16.4 DOSE ANALYSIS | 14.16-3 |
| 14.16.5 CONCLUSION | 14.16-4 |
| 14.16.6 REFERENCES | 14.16-4 |
| 14.17 <u>LOSS-OF-COOLANT ACCIDENT</u> | 14.17-1 |
| 14.17.1 INTRODUCTION AND SUMMARY | 14.17-1 |
| 14.17.2 LARGE BREAK LOCA ANALYSIS | 14.17-2 |
| 14.17.2.1 <u>Event Description</u> | 14.17-3 |
| 14.17.2.2 <u>Evaluation Model</u> | 14.17-4 |
| 14.17.2.3 <u>Plant Description and Summary of Analysis Parameters</u> | 14.17-7 |
| 14.17.2.4 <u>Analysis of Results</u> | 14.17-8 |
| 14.17.2.5 <u>Conclusions</u> | 14.17-9 |
| 14.17.3 SMALL BREAK LOCA ANALYSIS | 14.17-9 |
| 14.17.3.1 <u>Event Description</u> | 14.17-10 |
| 14.17.3.2 <u>Evaluation Model</u> | 14.17-10 |
| 14.17.3.3 <u>Plant Description and Summary of Analysis Parameters</u> | 14.17-11 |
| 14.17.3.4 <u>Results of the Small Break Analysis</u> | 14.17-12 |
| 14.17.3.5 <u>Conclusions</u> | 14.17-13 |
| 14.17.4 CURRENT CYCLE ANALYSES | 14.17-13 |
| 14.17.4.1 <u>Unit 1</u> | 14.17-13 |
| 14.17.4.2 <u>Unit 2</u> | 14.17-13 |
| 14.17.5 REFERENCES | 14.17-13 |
| 14.18 <u>FUEL HANDLING INCIDENT</u> | 14.18-1 |
| 14.18.1 GENERAL | 14.18-1 |
| 14.18.2 METHOD OF ANALYSIS | 14.18-2 |
| 14.18.3 RESULTS | 14.18-4 |
| 14.18.3.1 <u>Fuel Handling Incident in Containment</u> | 14.18-4 |
| 14.18.3.2 <u>Fuel Handling Incident in the Spent Fuel Pool Area</u> | 14.18-4 |
| 14.18.4 CONCLUSION | 14.18-5 |

CHAPTER 14
SAFETY ANALYSIS

TABLE OF CONTENTS

| | <u>PAGE</u> |
|--|--------------------|
| 14.18.5 REFERENCES | 14.18-5 |
| 14.19 <u>TURBINE-GENERATOR OVERSPEED INCIDENT</u> | 14.19-1 |
| 14.20 <u>CONTAINMENT RESPONSE</u> | 14.20-1 |
| 14.20.1 INTRODUCTION | 14.20-1 |
| 14.20.2 LOSS-OF-COOLANT ACCIDENT | 14.20-1 |
| 14.20.2.1 <u>Description of Event</u> | 14.20-1 |
| 14.20.2.2 <u>Mass and Energy Release</u> | 14.20-3 |
| 14.20.2.3 <u>Containment Response Analysis</u> | 14.20-4 |
| 14.20.2.4 <u>Inputs and Assumptions</u> | 14.20-12 |
| 14.20.2.5 <u>Results</u> | 14.20-14 |
| 14.20.2.6 <u>Summary of LOCA Analysis and Effect of the RSGs</u> | 14.20-15 |
| 14.20.3 MAIN STEAM LINE BREAK | 14.20-15 |
| 14.20.3.1 <u>Description of Event</u> | 14.20-15 |
| 14.20.3.2 <u>Mass and Energy Release Methodology</u> | 14.20-17 |
| 14.20.3.3 <u>Containment Response Analysis Methodology</u> | 14.20-17 |
| 14.20.3.4 <u>Inputs and Assumptions</u> | 14.20-18 |
| 14.20.3.5 <u>Analysis Results</u> | 14.20-21 |
| 14.20.3.6 <u>Summary of MSLB Analysis</u> | 14.20-21 |
| 14.20.4 SUBCOMPARTMENT ANALYSIS | 14.20-22 |
| 14.20.4.1 <u>Methodology</u> | 14.20-22 |
| 14.20.4.2 <u>Inputs and Assumptions</u> | 14.20-22 |
| 14.20.4.3 <u>Containment Internal Structure Evaluation Results</u> | 14.20-23 |
| 14.20.5 CONCLUSIONS | 14.20-24 |
| 14.20.6 REFERENCES | 14.20-24 |
| 14.21 <u>DELETED</u> | 14.21-1 |
| 14.22 <u>WASTE GAS INCIDENT</u> | 14.22-1 |
| 14.22.1 GENERAL | 14.22-1 |
| 14.22.2 METHOD OF ANALYSIS | 14.22-1 |
| 14.22.3 RESULTS | 14.22-1 |
| 14.22.4 CONCLUSIONS | 14.22-1 |
| 14.22.5 REFERENCES | 14.22-1 |
| 14.23 <u>WASTE PROCESSING SYSTEM INCIDENT</u> | 14.23-1 |
| 14.23.1 GENERAL | 14.23-1 |
| 14.23.2 METHOD OF ANALYSIS | 14.23-1 |
| 14.23.3 ASSUMPTIONS | 14.23-1 |
| 14.23.4 RESULTS | 14.23-2 |
| 14.23.5 CONCLUSIONS | 14.23-2 |
| 14.23.6 REFERENCES | 14.23-2 |

CHAPTER 14
SAFETY ANALYSIS
TABLE OF CONTENTS

| | | <u>PAGE</u> |
|--------------|--|--------------------|
| 14.24 | <u>MAXIMUM HYPOTHETICAL ACCIDENT</u> | 14.24-1 |
| 14.24.1 | GENERAL | 14.24-1 |
| 14.24.2 | METHOD OF ANALYSIS | 14.24-1 |
| | 14.24.2.1 <u>Control Room</u> | 14.24-1 |
| | 14.24.2.2 <u>Source Terms</u> | 14.24-1 |
| | 14.24.2.3 <u>Containment Pathway</u> | 14.24-2 |
| | 14.24.2.4 <u>Ventilation Stack Pathway</u> | 14.24-3 |
| | 14.24.2.5 <u>Hydrogen Purge Line Pathway</u> | 14.24-4 |
| | 14.24.2.6 <u>Refueling Water Tank Pathway</u> | 14.24-4 |
| | 14.24.2.7 <u>Containment Shine</u> | 14.24-5 |
| | 14.24.2.8 <u>Plume Shine</u> | 14.24-5 |
| | 14.24.2.9 <u>Control Room Filter Shine</u> | 14.24-6 |
| 14.24.3 | RESULTS | 14.24-6 |
| 14.24.4 | REFERENCES | 14.24-7 |
| 14.25 | <u>EXCESSIVE CHARGING EVENT</u> | 14.25-1 |
| 14.25.1 | IDENTIFICATION OF EVENT AND CAUSE | 14.25-1 |
| 14.25.2 | CORE AND SYSTEM PERFORMANCE | 14.25-1 |
| | 14.25.2.1 <u>Mathematical Models</u> | 14.25-1 |
| | 14.25.2.2 <u>Input Parameters and Initial Conditions</u> | 14.25-1 |
| | 14.25.2.3 <u>Results</u> | 14.25-1 |
| 14.25.3 | CONCLUSIONS | 14.25-1 |
| 14.26 | <u>FEEDLINE BREAK EVENT</u> | 14.26-1 |
| 14.26.1 | IDENTIFICATION OF EVENT AND CAUSE | 14.26-1 |
| 14.26.2 | SEQUENCE OF EVENTS | 14.26-1 |
| 14.26.3 | CORE AND SYSTEM PERFORMANCE | 14.26-2 |
| | 14.26.3.1 <u>Mathematical Models</u> | 14.26-2 |
| | 14.26.3.2 <u>Input Parameters and Initial Conditions</u> | 14.26-2 |
| | 14.26.3.3 <u>Results</u> | 14.26-3 |
| 14.26.4 | CONCLUSION | 14.26-4 |
| 14.26.5 | REFERENCES | 14.26-4 |

CHAPTER 14
SAFETY ANALYSIS

LIST OF TABLES

| <u>TITLE</u> | <u>PAGE</u> | |
|---------------------|--|---------|
| 14.1-1 | DESIGN BASIS EVENTS | 14.1-22 |
| 14.1-2 | SAFETY ANALYSIS VALVE AND PUMP ASSUMPTIONS | 14.1-23 |
| 14.1-3 | DECONTAMINATION FACTORS USED IN OFFSITE DOSE CALCULATIONS | 14.1-24 |
| 14.2-1 | INITIAL CONDITIONS AND INPUT PARAMETERS - CEAW EVENT | 14.2-7 |
| 14.2-2 | SEQUENCE OF EVENTS FOR ZERO POWER CEAW EVENT | 14.2-8 |
| 14.2-3 | SEQUENCE OF EVENTS FOR FULL POWER CEAW EVENT | 14.2-9 |
| 14.3-1 | INITIAL CONDITIONS AND INPUT PARAMETERS FOR THE BORON DILUTION EVENT | 14.3-5 |
| 14.3-2 | RESULTS OF BORON DILUTION EVENT | 14.3-6 |
| 14.4-1 | INITIAL CONDITIONS AND INPUT PARAMETERS TO DETERMINE APPROACH TO SAFDLs FOR THE EXCESS LOAD EVENT | 14.4-7 |
| 14.4-2 | SEQUENCE OF EVENTS FOR THE ZERO POWER EXCESS LOAD CONDITIONS TO CALCULATE MAXIMUM LHR | 14.4-8 |
| 14.4-3 | SEQUENCE OF EVENTS FOR APPROACH TO SAFDLs FOR THE FULL POWER EXCESS LOAD EVENT | 14.4-9 |
| 14.5-1 | INITIAL CONDITIONS AND INPUT PARAMETERS FOR THE LOSS OF LOAD EVENT TO CALCULATE MAXIMUM RCS PRESSURE | 14.5-4 |
| 14.5-2 | SEQUENCE OF EVENTS FOR LOSS OF LOAD EVENT TO MAXIMIZE CALCULATED RCS PEAK PRESSURE | 14.5-5 |
| 14.5-3 | INITIAL CONDITIONS AND INPUT PARAMETERS FOR THE LOSS OF LOAD EVENT TO CALCULATE MAXIMUM SECONDARY PRESSURE | 14.5-6 |
| 14.5-4 | SEQUENCE OF EVENTS FOR LOSS OF LOAD EVENT TO MAXIMIZE CALCULATED SECONDARY PEAK PRESSURE | 14.5-7 |
| 14.6-1 | INITIAL CONDITIONS AND INPUT PARAMETERS FOR THE LOFW EVENT TO MAXIMIZE CALCULATED PEAK PRESSURE | 14.6-5 |
| 14.6-2 | INITIAL CONDITIONS AND INPUT PARAMETERS FOR THE LOFW EVENT TO MAXIMIZE SG INVENTORY DEPLETION | 14.6-6 |
| 14.6-3 | SEQUENCE OF EVENTS FOR LOFW EVENT TO MAXIMIZE CALCULATED PEAK RCS PRESSURE | 14.6-7 |
| 14.6-4 | SEQUENCE OF EVENTS FOR THE LOFW EVENT TO MAXIMIZE CALCULATED PEAK SECONDARY PRESSURE | 14.6-8 |
| 14.6-5 | SEQUENCE OF EVENTS FOR THE LOFW EVENT TO MAXIMIZE STEAM GENERATOR INVENTORY DEPLETION | 14.6-9 |
| 14.7-1 | INITIAL CONDITIONS AND INPUT PARAMETERS FOR THE EXCESS FEEDWATER HEAT REMOVAL EVENT | 14.7-3 |
| 14.7-2 | SEQUENCE OF EVENTS FOR THE EXCESS FEEDWATER HEAT REMOVAL EVENT | 14.7-4 |

CHAPTER 14
SAFETY ANALYSIS

LIST OF TABLES

| <u>TITLE</u> | <u>PAGE</u> | |
|---------------------|---|----------|
| 14.8-1 | INITIAL CONDITIONS AND INPUT PARAMETERS FOR RCS DEPRESSURIZATION EVENT | 14.8-4 |
| 14.8-2 | SEQUENCE OF EVENTS FOR THE RCS DEPRESSURIZATION EVENT | 14.8-5 |
| 14.9-1 | INITIAL CONDITIONS AND INPUT PARAMETERS FOR LOSS-OF-COOLANT FLOW EVENT | 14.9-4 |
| 14.9-2 | SEQUENCE OF EVENTS FOR LOSS-OF-COOLANT FLOW EVENT | 14.9-5 |
| 14.10-1 | INITIAL CONDITIONS AND INPUT PARAMETERS FOR LOSS-OF-NON-EMERGENCY AC POWER EVENT | 14.10-4 |
| 14.10-2 | SEQUENCE OF EVENTS FOR LOSS-OF-NON-EMERGENCY AC POWER EVENT | 14.10-5 |
| 14.10-3 | RADIOLOGICAL ASSUMPTIONS AND RESULTS FOR LOSS-OF-NON-EMERGENCY AC POWER EVENT | 14.10-6 |
| 14.11-1 | INITIAL CONDITIONS AND INPUT PARAMETERS FOR CEA DROP EVENT | 14.11-4 |
| 14.11-2 | SEQUENCE OF EVENTS FOR THE CEA DROP EVENT | 14.11-5 |
| 14.12-1 | INITIAL CONDITIONS AND INPUT PARAMETERS FOR THE LOSS OF LOAD TO ONE STEAM GENERATOR | 14.12-5 |
| 14.12-2 | SEQUENCE OF EVENTS FOR THE LOSS OF LOAD TO ONE STEAM GENERATOR | 14.12-6 |
| 14.13-1 | INITIAL CONDITIONS AND INPUT PARAMETERS FOR THE CEA EJECTION EVENT | 14.13-7 |
| 14.13-2 | CEA EJECTION EVENT RESULTS | 14.13-8 |
| 14.13-3 | ASSUMPTIONS FOR RADIOLOGICAL CONSEQUENCES OF THE CEA EJECTION EVENT | 14.13-9 |
| 14.14-1 | INITIAL CONDITIONS AND INPUT PARAMETERS ASSUMED FOR THE POST-TRIP SLB EVENT INITIATED FROM FULL POWER | 14.14-12 |
| 14.14-2 | INITIAL CONDITIONS AND INPUT PARAMETERS ASSUMED FOR THE PRE-TRIP SLB EVENT INITIATED FROM FULL POWER | 14.14-13 |
| 14.14-3 | ASSUMPTIONS FOR THE RADIOLOGICAL EVALUATION FOR THE SLB EVENT | 14.14-14 |
| 14.14-4 | SEQUENCE OF EVENTS FOR THE POST-TRIP SLB EVENT | 14.14-15 |
| 14.14-5 | SEQUENCE OF EVENTS FOR PRE-TRIP SLB EVENT WITH LOOP ON TURBINE TRIP INITIATED FROM FULL POWER | 14.14-16 |
| 14.15-1 | INITIAL CONDITIONS AND INPUT PARAMETERS FOR THE STEAM GENERATOR TUBE RUPTURE EVENT | 14.15-11 |
| 14.15-2 | SEQUENCE OF EVENTS FOR THE STEAM GENERATOR TUBE RUPTURE EVENT | 14.15-12 |
| 14.15-3 | ASSUMPTIONS FOR RADIOLOGICAL CONSEQUENCES OF THE STEAM GENERATOR TUBE RUPTURE EVENT | 14.15-13 |

CHAPTER 14
SAFETY ANALYSIS

LIST OF TABLES

| <u>TITLE</u> | <u>PAGE</u> | |
|---------------------|--|----------|
| 14.16-1 | INITIAL CONDITIONS AND INPUT PARAMETERS FOR SEIZED ROTOR EVENT | 14.16-5 |
| 14.16-2 | SEQUENCE OF EVENTS FOR SEIZED ROTOR EVENT | 14.16-6 |
| 14.16-3 | ASSUMPTIONS FOR SEIZED ROTOR DOSE CALCULATION | 14.16-7 |
| 14.17-1 | SAMPLED LARGE BREAK LOCA PARAMETERS | 14.17-15 |
| 14.17-2 | PLANT OPERATING RANGE SUPPORTED BY THE LOCA ANALYSIS | 14.17-16 |
| 14.17-3 | STATISTICAL DISTRIBUTIONS USED FOR PROCESS PARAMETERS | 14.17-18 |
| 14.17-4 | SUMMARY OF MAJOR PARAMETERS FOR THE LIMITING PCT CASE | 14.17-19 |
| 14.17-5 | SUMMARY OF HOT ROD LIMITING PCT RESULTS | 14.17-20 |
| 14.17-6 | CALCULATED EVENT TIMES FOR THE LIMITING PCT CASE | 14.17-21 |
| 14.17-7 | CONTAINMENT HEAT SINK DATA | 14.17-22 |
| 14.17-8 | CONTAINMENT INITIAL AND BOUNDARY CONDITIONS | 14.17-23 |
| 14.17-9 | SMALL BREAK LOCA ANALYSIS ECCS PERFORMANCE | 14.17-24 |
| 14.17-10 | SMALL BREAK LOCA ANALYSIS ECCS PERFORMANCE | 14.17-25 |
| 14.17-11 | SMALL BREAK LOCA ANALYSIS ECCS PERFORMANCE` | 14.17-26 |
| 14.17-12 | SMALL BREAK LOCA ECCS PERFORMANCE ANALYSIS | 14.17-27 |
| 14.18-1 | SOURCE TERM FOR FUEL HANDLING ACCIDENT IN CONTAINMENT OR SPENT FUEL POOL BASED UPON ALTERNATIVE SOURCE TERM METHODOLOGY | 14.18-7 |
| 14.18-2 | OFFSITE AND CONTROL ROOM DOSES FOR A FUEL HANDLING ACCIDENT IN CONTAINMENT OR SPENT FUEL POOL BASED UPON ALTERNATIVE SOURCE TERM METHODOLOGY | 14.18-8 |
| 14.20-1 | SUMMARY OF SIGNIFICANT ASSUMPTIONS FOR LOSS-OF-COOLANT ACCIDENT MASS and ENERGY RELEASE METHODOLOGY | 14.20-28 |
| 14.20-2 | INITIAL CONDITIONS AND KEY ASSUMPTIONS FOR MASS AND ENERGY RELEASE ANALYSIS OF LOSS-OF-COOLANT ACCIDENT | 14.20-30 |
| 14.20-3 | CONTAINMENT PARAMETERS | 14.20-31 |
| 14.20-4 | CONTAINMENT HEAT SINK THERMODYNAMIC DATA | 14.20-32 |
| 14.20-5 | CONTAINMENT HEAT SINKS | 14.20-33 |
| 14.20-6 | ENGINEERED SAFETY FEATURES PERFORMANCE FOR LOSS-OF-COOLANT ACCIDENT CONTAINMENT ANALYSES | 14.20-38 |
| 14.20-7 | SEQUENCE OF EVENTS FOR DOUBLE-ENDED DISCHARGE LEG MINIMUM SI LOSS-OF-COOLANT ACCIDENT | 14.20-40 |
| 14.20-8 | SUMMARY OF SIGNIFICANT ASSUMPTIONS FOR MAIN STEAM LINE BREAK MASS and ENERGY RELEASE CALCULATIONS | 14.20-41 |

CHAPTER 14
SAFETY ANALYSIS

LIST OF TABLES

| <u>TITLE</u> | <u>PAGE</u> | |
|---------------------|---|----------|
| 14.20-9 | INITIAL CONDITIONS AND KEY ASSUMPTIONS FOR ANALYSIS OF MASS AND ENERGY RELEASE FOR MAIN STEAM LINE BREAK | 14.20-42 |
| 14.20-10 | INITIAL CONDITIONS AND KEY ASSUMPTIONS FOR ANALYSIS OF CONTAINMENT RESPONSE TO MAIN STEAM LINE BREAK | 14.20-44 |
| 14.20-11 | ENGINEERED SAFETY FEATURE PERFORMANCE PARAMETERS USED FOR CONTAINMENT ANALYSIS FOR MAIN STEAM LINE BREAK | 14.20-45 |
| 14.20-12 | SEQUENCE OF EVENTS FOR MAIN STEAM LINE BREAK INSIDE CONTAINMENT | 14.20-46 |
| 14.20-13 | INPUT PARAMETERS COMPARTMENT PRESSURIZATION ANALYSIS | 14.20-47 |
| 14.23-1 | SUMMARY OF COMPONENT DECONTAMINATION FACTORS AND AMOUNT OF PRIOR PROCESSING CREDITED FOR EACH WASTE PROCESSING SYSTEM COMPONENT | 14.23-3 |
| 14.25-1 | EXCESSIVE CHARGING EVENT - CORE AND SYSTEM PERFORMANCE FOR CHARGING FLOW AND LETDOWN FLOW | 14.25-2 |
| 14.26-1 | INITIAL CONDITIONS AND INPUT PARAMETERS ASSUMED IN THE FEEDWATER LINE BREAK EVENT | 14.26-5 |
| 14.26-2 | ASSUMPTIONS FOR THE RADIOLOGICAL EVALUATION FOR THE FEEDLINE BREAK EVENT | 14.26-6 |
| 14.26-3 | SEQUENCE OF EVENTS FOR FEEDWATER LINE BREAK WITH LOAC FOLLOWING REACTOR TRIP | 14.26-7 |

CHAPTER 14
SAFETY ANALYSIS

LIST OF FIGURES

FIGURE

| | |
|---------|--|
| 14.2-1 | CEAW EVENT - HZP CORE POWER VS TIME |
| 14.2-2 | CEAW EVENT - HZP CORE HEAT FLUX VS TIME |
| 14.2-3 | CEAW EVENT - HZP RCS TEMPERATURES VS TIME |
| 14.2-4 | CEAW EVENT - HZP RCS PRESSURE VS TIME |
| 14.2-5 | CEAW EVENT - HFP CORE POWER VS TIME |
| 14.2-6 | CEAW EVENT - HFP CORE HEAT FLUX VS TIME |
| 14.2-7 | CEAW EVENT - HFP RCS TEMPERATURES VS TIME |
| 14.2-8 | CEAW EVENT - HFP RCS PRESSURE VS TIME |
| 14.4-1 | EXCESS LOAD EVENT - CORE POWER VS TIME (HFP) |
| 14.4-2 | EXCESS LOAD EVENT - CORE HEAT FLUX VS TIME (HFP) |
| 14.4-3 | EXCESS LOAD EVENT - RCS TEMPERATURES VS TIME (HFP) |
| 14.4-4 | EXCESS LOAD EVENT - PRESSURIZER PRESSURE VS TIME (HFP) |
| 14.4-5 | EXCESS LOAD EVENT - REACTIVITIES VS TIME (HFP) |
| 14.4-6 | EXCESS LOAD EVENT - SG PRESSURES VS TIME (HFP) |
| 14.4-7 | EXCESS LOAD EVENT - CORE POWER VS TIME (HWP) |
| 14.4-8 | EXCESS LOAD EVENT - CORE HEAT FLUX VS TIME (HWP) |
| 14.4-9 | EXCESS LOAD EVENT - RCS TEMPERATURES VS TIME (HWP) |
| 14.4-10 | EXCESS LOAD EVENT - PRESSURIZER PRESSURE VS TIME (HWP) |
| 14.4-11 | EXCESS LOAD EVENT - REACTIVITIES VS TIME (HWP) |
| 14.4-12 | EXCESS LOAD EVENT - SG PRESSURES VS TIME (HWP) |
| 14.5-1 | LOSS OF LOAD EVENT CORE POWER VS TIME |
| 14.5-2 | LOSS OF LOAD EVENT CORE AVERAGE HEAT FLUX VS TIME |
| 14.5-3 | LOSS OF LOAD EVENT RCS PRESSURE VS TIME |
| 14.5-4 | LOSS OF LOAD EVENT RCS TEMPERATURES VS TIME |
| 14.5-5 | LOSS OF LOAD EVENT STEAM GENERATOR PRESSURE VS TIME |
| 14.5-6 | LOSS OF LOAD EVENT PRESSURIZER WATER VOLUME VS TIME |
| 14.6-1 | LOSS OF FEEDWATER FLOW EVENT MAXIMUM RCS PEAK PRESSURE CORE POWER VS TIME |
| 14.6-2 | LOSS OF FEEDWATER FLOW EVENT MAXIMUM RCS PEAK PRESSURE RCS TEMPERATURES VS TIME |
| 14.6-3 | LOSS OF FEEDWATER FLOW EVENT MAXIMUM RCS PEAK PRESSURE RCS PRESSURE VS TIME |
| 14.6-4 | LOSS OF FEEDWATER FLOW EVENT MAXIMUM RCS PEAK PRESSURE STEAM GENERATOR PRESSURE VS TIME |
| 14.6-5 | LOSS OF FEEDWATER FLOW EVENT MAXIMUM SECONDARY PEAK PRESSURE CORE POWER VS TIME |
| 14.6-6 | LOSS OF FEEDWATER FLOW EVENT MAXIMUM SECONDARY PEAK PRESSURE RCS TEMPERATURES VS TIME |
| 14.6-7 | LOSS OF FEEDWATER FLOW EVENT MAXIMUM SECONDARY PEAK PRESSURE PRESSURIZER PRESSURE VS TIME |

CHAPTER 14
SAFETY ANALYSIS

LIST OF FIGURES

FIGURE

| | |
|---------|--|
| 14.6-8 | LOSS OF FEEDWATER FLOW EVENT MAXIMUM SECONDARY PEAK PRESSURE STEAM GENERATOR PRESSURE VS TIME |
| 14.6-9 | LOSS OF FEEDWATER FLOW EVENT MAXIMUM STEAM GENERATOR INVENTORY DEPLETION CORE POWER VS TIME |
| 14.6-10 | LOSS OF FEEDWATER FLOW EVENT MAXIMUM STEAM GENERATOR INVENTORY DEPLETION RCS TEMPERATURES VS TIME |
| 14.6-11 | LOSS OF FEEDWATER FLOW EVENT MAXIMUM STEAM GENERATOR INVENTORY DEPLETION PRESSURIZER PRESSURE VS TIME |
| 14.6-12 | LOSS OF FEEDWATER FLOW EVENT MAXIMUM STEAM GENERATOR INVENTORY DEPLETION STEAM GENERATOR PRESSURE VS TIME |
| 14.6-13 | LOSS OF FEEDWATER FLOW EVENT MAXIMUM STEAM GENERATOR INVENTORY DEPLETION STEAM GENERATOR INVENTORY VS TIME |
| 14.7-1 | EXCESS FEEDWATER HEAT REMOVAL EVENT, CORE POWER VERSUS TIME |
| 14.7-2 | EXCESS FEEDWATER HEAT REMOVAL EVENT, CORE HEAT FLUX VERSUS TIME |
| 14.7-3 | EXCESS FEEDWATER HEAT REMOVAL EVENT, RCS TEMPERATURES VERSUS TIME |
| 14.7-4 | EXCESS FEEDWATER HEAT REMOVAL EVENT, RCS PRESSURE VERSUS TIME |
| 14.7-5 | EXCESS FEEDWATER HEAT REMOVAL EVENT, STEAM GENERATOR PRESSURES VERSUS TIME |
| 14.7-6 | EXCESS FEEDWATER HEAT REMOVAL EVENT, STEAM GENERATOR TEMPERATURE VERSUS TIME |
| 14.8-1 | RCS DEPRESSURIZATION EVENT CORE POWER VS TIME |
| 14.8-2 | RCS DEPRESSURIZATION EVENT CORE AVERAGE HEAT FLUX VS TIME |
| 14.8-3 | RCS DEPRESSURIZATION EVENT RCS TEMPERATURES VS TIME |
| 14.8-4 | RCS DEPRESSURIZATION EVENT RCS PRESSURE VS TIME |
| 14.9-1 | LOSS OF COOLANT FLOW EVENT CORE FLOW FRACTION VS TIME |
| 14.9-2 | LOSS OF COOLANT FLOW EVENT CORE POWER VS TIME |
| 14.9-3 | LOSS OF COOLANT FLOW EVENT CORE HEAT FLUX VS TIME |
| 14.9-4 | LOSS OF COOLANT FLOW EVENT RCS TEMPERATURES VS TIME |
| 14.9-5 | LOSS OF COOLANT FLOW EVENT RCS PRESSURE VS TIME |
| 14.10-1 | LOSS OF ALL NON-EMERGENCY AC POWER EVENT CORE POWER VS TIME |
| 14.10-2 | LOSS OF ALL NON-EMERGENCY AC POWER EVENT CORE AVERAGE HEAT FLUX VS TIME |
| 14.10-3 | LOSS OF ALL NON-EMERGENCY AC POWER EVENT REACTOR COOLANT SYSTEM TEMPERATURE VS TIME |
| 14.10-4 | LOSS OF ALL NON-EMERGENCY AC POWER EVENT REACTOR COOLANT SYSTEM PRESSURE VS TIME |

CHAPTER 14
SAFETY ANALYSIS

LIST OF FIGURES

FIGURE

| | |
|--------------|--|
| 14.10-5 | LOSS OF ALL NON-EMERGENCY AC POWER EVENT STEAM GENERATOR PRESSURE VS TIME |
| 14.11-1 | FULL LENGTH CEA DROP CORE POWER VERSUS TIME |
| 14.11-2 | FULL LENGTH CEA DROP CORE HEAT FLUX VERSUS TIME |
| 14.11-3 | FULL LENGTH CEA DROP RCS TEMPERATURES VERSUS TIME |
| 14.11-4 | FULL LENGTH CEA DROP RCS PRESSURE VERSUS TIME |
| 14.12-1 | LOSS OF LOAD /1 STEAM GENERATOR EVENT RADIAL DISTORTION FACTOR VS CORE INLET TEMPERATURE ASYMMETRY |
| 14.12-2 | LOSS OF LOAD/1 SG EVENT CORE POWER VS TIME |
| 14.12-3 | LOSS OF LOAD/1 SG EVENT CORE HEAT FLUX VS TIME |
| 14.12-4 | LOSS OF LOAD/1 SG EVENT RCS TEMPERATURES VS TIME |
| 14.12-5 | LOSS OF LOAD/1 SG EVENT PRESSURIZER PRESSURE VS TIME |
| 14.12-6 | LOSS OF LOAD/1 SG EVENT SG PRESSURES VS TIME |
| 14.13-1 | CEA EJECTION EVENT HOT FULL POWER CORE POWER VS TIME |
| 14.13-2 | CEA EJECTION EVENT HOT ZERO POWER CORE POWER VS TIME |
| 14.14-1 | SLB EVENT POST TRIP MODERATOR REACTIVITY VS MODERATOR DENSITY |
| 14.14-2 | SLB EVENT POST-TRIP CORE POWER VS TIME |
| 14.14-3 | SLB EVENT POST-TRIP CORE HEAT FLUX VS TIME |
| 14.14-4 | SLB EVENT POST-TRIP PRESSURIZER PRESSURE VS TIME |
| 14.14-5 | SLB EVENT POST-TRIP RCS TEMPERATURES VS TIME |
| 14.14-6 | SLB EVENT POST-TRIP REACTIVITIES VS TIME |
| 14.14-7 | SLB EVENT POST-TRIP SG PRESSURE VS TIME |
| 14.14-8 | SLB EVENT PRE-TRIP CORE POWER VS TIME |
| 14.14-9 | SLB EVENT PRE-TRIP CORE HEAT FLUX VS TIME |
| 14.14-10 | SLB EVENT PRE-TRIP PRESSURIZER PRESSURE VS TIME |
| 14.14-11 | SLB EVENT PRE-TRIP RCS TEMPERATURES VS TIME |
| 14.14-12 | SLB EVENT PRE-TRIP REACTIVITIES VS TIME |
| 14.14-13 | SLB EVENT PRE-TRIP SG PRESSURES VS TIME |
| 14.15-1 sh 1 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| 14.15-1 sh 2 | ACTIONS CORE POWER VS TIME |
| 14.15-2 sh 1 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| 14.15-2 sh 2 | ACTIONS REACTOR COOLANT SYSTEM PRESSURE VS TIME |
| 14.15-3 sh 1 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| 14.15-3 sh 2 | ACTIONS CORE COOLANT TEMPERATURE VS TIME |
| 14.15-3 sh 3 | Deleted |
| 14.15-4 sh 1 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| 14.15-4 sh 2 | ACTIONS PRESSURIZER WATER VOLUME VS TIME |

CHAPTER 14
SAFETY ANALYSIS

LIST OF FIGURES

FIGURE

| | |
|---------------|---|
| 14.15-5 sh 1 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| 14.15-5 sh 2 | ACTIONS UPPER HEAD VOID FRACTION VS TIME |
| 14.15-6 sh 1 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| 14.15-6 sh 2 | ACTIONS RCS LIQUID MASS VS TIME |
| 14.15-7 sh 1 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| 14.15-7 sh 2 | ACTIONS STEAM GENERATOR PRESSURE VS TIME |
| 14.15-8 sh 1 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| 14.15-8 sh 2 | ACTIONS TUBE LEAK RATE VS TIME |
| 14.15-9 sh 1 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| 14.15-9 sh 2 | ACTIONS INTEGRATED LEAK FLOW VS TIME |
| 14.15-10 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| | ACTIONS FLASHING FRACTION VS TIME |
| 14.15-11 sh 1 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| 14.15-11 sh 2 | ACTIONS STEAM GENERATOR MASS VS TIME |
| 14.15-11 sh 3 | Deleted |
| 14.15-12 sh 1 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| 14.15-12 sh 2 | ACTIONS INTEGRATED SAFETY INJECTION FLOW VS TIME |
| 14.15-13 sh 1 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| 14.15-13 sh 2 | ACTIONS AUXILIARY FEEDWATER FLOW VS TIME |
| 14.15-14 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| | ACTIONS STEAM GENERATOR SAFETY VALVE FLOW VS TIME |
| 14.15-15 sh 1 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| 14.15-15 sh 2 | ACTIONS INTEGRATED MSSV FLOW VS TIME |
| 14.15-16 sh 1 | STEAM GENERATOR TUBE RUPTURE WITH EOP BASED OPERATOR |
| 14.15-16 sh 2 | ACTIONS HOT LEG SUBCOOLING VS TIME |
| 14.16-1 | SEIZED ROTOR EVENT CORE POWER VS TIME |
| 14.16-2 | SEIZED ROTOR EVENT CORE AVERAGE HEAT FLUX VS TIME |
| 14.16-3 | SEIZED ROTOR EVENT REACTOR COOLANT SYSTEM |
| | TEMPERATURES VS TIME |
| 14.16-4 | SEIZED ROTOR EVENT REACTOR COOLANT SYSTEM PRESSURE VS |
| | TIME |
| 14.17-1 | SCATTER PLOT OF OPERATIONAL PARAMETERS (Sheet 1) |
| 14.17-1 | SCATTER PLOT OF OPERATIONAL PARAMETERS (Sheet 2) |
| 14.17-2 | PCT VERSUS PCT TIME - SCATTER PLOT FROM 59 CALCULATIONS |
| 14.17-3 | PCT VERSUS BREAK SIZE - SCATTER PLOT FROM 59 CALCULATIONS |
| 14.17-4 | MAXIMUM OXIDATION VERSUS PCT - SCATTER PLOT FROM 59 |
| | CALCULATIONS |
| 14.17-5 | TOTAL OXIDATION VERSUS PCT - SCATTER PLOT FROM 59 |
| | CALCULATIONS |

CHAPTER 14
SAFETY ANALYSIS

LIST OF FIGURES

FIGURE

| | |
|----------|---|
| 14.17-6 | PEAK CLADDING TEMPERATURE (INDEPENDENT OF ELEVATION) FOR THE LIMITING CASE |
| 14.17-7 | BREAK FLOW FOR THE LIMITING CASE |
| 14.17-8 | CORE INLET MASS FLUX FOR THE LIMITING CASE |
| 14.17-9 | CORE OUTLET MASS FLUX FOR THE LIMITING CASE |
| 14.17-10 | VOID FRACTION AT RCS PUMPS FOR THE LIMITING CASE |
| 14.17-11 | ECCS FLOWS (INCLUDES SIT, LPSI, AND HPSI) FOR THE LIMITING CASE |
| 14.17-12 | UPPER PLENUM PRESSURE FOR THE LIMITING CASE |
| 14.17-13 | COLLAPSED LIQUID LEVEL IN THE DOWNCOMER FOR THE LIMITING CASE |
| 14.17-14 | COLLAPSED LIQUID LEVEL IN THE LOWER PLENUM FOR THE LIMITING CASE |
| 14.17-15 | COLLAPSED LIQUID LEVEL IN THE CORE FOR THE LIMITING CASE |
| 14.17-16 | CONTAINMENT LOOP PRESSURES FOR THE LIMITING CASE |
| 14.17-17 | LOOP VERSUS NO-LOOP CASES |
| 14.17-18 | SMALL BREAK LOCA - ECCS PERFORMANCE ANALYSIS FOR THE LIMITING CASE - REACTOR POWER |
| 14.17-19 | SMALL BREAK LOCA - ECCS PERFORMANCE ANALYSIS FOR THE LIMITING CASE – PRIMARY AND SECONDARY PRESSURE |
| 14.17-20 | SMALL BREAK LOCA - ECCS PERFORMANCE ANALYSIS FOR THE LIMITING CASE - BREAK FLOW RATE |
| 14.17-21 | SMALL BREAK LOCA - ECCS PERFORMANCE ANALYSIS FOR THE LIMITING CASE – CORE INLET FLOW RATE |
| 14.17-22 | SMALL BREAK LOCA - ECCS PERFORMANCE ANALYSIS FOR THE LIMITING CASE – HOT ASSEMBLY MIXTURE |
| 14.17-23 | SMALL BREAK LOCA - ECCS PERFORMANCE ANALYSIS FOR THE LIMITING CASE – CLADDING TEMPERATURE AT HOT SPOT |
| 14.20-1 | CONTAINMENT AIR COOLER CAPABILITY |
| 14.20-2 | COLD LEG DISCHARGE LOCA - MAXIMUM SI, CONTAINMENT PRESSURE AND TEMPERATURE AND CONTAINMENT SUMP TEMPERATURE VERSUS TIME |
| 14.20-3 | MAIN STEAM LINE BREAK, CONTAINMENT PRESSURE AND TEMPERATURE VERSUS TIME |
| 14.21-1 | Deleted |
| 14.21-2 | Deleted |
| 14.21-3 | Deleted |
| 14.21-4 | Deleted |
| 14.21-5 | Deleted |
| 14.21-6 | Deleted |
| 14.21-7 | Deleted |

CHAPTER 14
SAFETY ANALYSIS

LIST OF FIGURES

FIGURE

| | |
|----------|---|
| 14.26-1 | FEEDLINE BREAK EVENT WITH LOAC FOLLOWING REACTOR TRIP RCS PEAK PRESSURE VS BREAK SIZE |
| 14.26-2 | FEEDLINE BREAK EVENT WITH LOAC FOLLOWING REACTOR TRIP CORE POWER VS TIME |
| 14.26-3 | FEEDLINE BREAK EVENT WITH LOAC FOLLOWING REACTOR TRIP CORE AVERAGE HEAT FLUX VS TIME |
| 14.26-4 | FEEDLINE BREAK EVENT WITH LOAC FOLLOWING REACTOR TRIP RCS TEMPERATURES VS TIME |
| 14.26-5 | FEEDLINE BREAK EVENT WITH LOAC FOLLOWING REACTOR TRIP RCS PRESSURE VS TIME |
| 14.26-6 | FEEDLINE BREAK EVENT WITH NO LOAC FOLLOWING REACTOR TRIP STEAM GENERATOR PRESSURE VS TIME |
| 14.26-7 | FEEDLINE BREAK EVENT WITH NO LOAC FOLLOWING REACTOR TRIP STEAM GENERATOR INVENTORY VS TIME |
| 14.26-8 | FEEDLINE BREAK EVENT WITH NO LOAC FOLLOWING REACTOR TRIP AUXILIARY FEEDWATER FLOW VS TIME |
| 14.26-9 | FEEDLINE BREAK EVENT WITH NO LOAC FOLLOWING REACTOR TRIP INTEGRATED BREAK FLOW VS TIME |
| 14.26-10 | FEEDLINE BREAK EVENT WITH NO LOAC FOLLOWING REACTOR TRIP BREAK FLOW VS TIME |
| 14.26-11 | Deleted |

CHAPTER 14
SAFETY ANALYSIS

LIST OF ACRONYMS

| | |
|--------|--|
| ABB | Asea Brown Boveri |
| ADV | Atmospheric Dump Valve |
| AEC | Atomic Energy Commission |
| AFAS | Auxiliary Feedwater Actuation System |
| AFW | Auxiliary Feedwater |
| ANS | American Nuclear Society |
| AOO | Anticipated Operational Occurrence |
| AOR | Analysis of Record |
| ASGPT | Asymmetric Steam Generator Protection Trip |
| ASI | Axial Shape Index |
| AST | Alternative Source Term |
| BOC | Beginning of Cycle |
| CAC | Containment Air Cooler |
| CBP | Condensate Booster Pump |
| CE | Combustion Engineering, Inc. |
| CEA | Control Element Assembly |
| CEAW | Control Element Assembly Withdrawal |
| CEDM | Control Element Drive Mechanism |
| CHF | Critical Heat Flux |
| CIS | Concurrent Iodine Spike |
| CSAS | Containment Spray Actuation Signal |
| CTM | Centerline Temperature Melt |
| CVCS | Chemical and Volume Control System |
| DBA | Design Basis Accident |
| DBE | Design Basis Event |
| DEG | Double-Ended Guillotine |
| DEG/PD | Double-Ended Guillotine at Pump Discharge |
| DEQ | Dose Equivalent Curies |
| DES/PD | Double-Ended Slot at Pump Discharge |
| DNB | Departure from Nucleate Boiling |
| DNBR | Departure from Nucleate Boiling Ratio |
| EAB | Exclusion Area Boundary |
| ECCS | Emergency Core Cooling System |
| EOC | End of Cycle |
| EOP | Emergency Operating Procedures |
| ESF | Engineered Safety Feature |
| ESFAS | Engineered Safety Feature Actuation System |
| FCM | Fuel Centerline Melt |
| FHI | Fuel Handling Incident |
| FLB | Feedline Break |
| FSAR | Final Safety Analysis Report |
| FTC | Fuel Temperature Coefficient |
| FTI | Framatome Technologies, Inc. |
| GIS | Generated Iodine Spike |
| HDP | Heater Drain Pump |
| HEPA | High Efficiency Particulate Air |
| HFP | Hot Full Power |
| HPSI | High Pressure Safety Injection |

CHAPTER 14
SAFETY ANALYSIS

LIST OF ACRONYMS

| | |
|-------|---|
| HPT | High Power Trip |
| HTP | High Thermal Performance |
| HZP | Hot Zero Power |
| ICI | Incore Instrumentation |
| IFBA | Integral Fuel Burnable Absorber |
| LCO | Limiting Conditions for Operation |
| LHGR | Linear Heat Generation Rate |
| LHR | Linear Heat Rate |
| LOAC | Loss-of-Non-Emergency AC Power |
| LOCA | Loss-of-Coolant Accident |
| LOFW | Loss of Feedwater |
| LOOP | Loss of Offsite Power |
| LPD | Local Power Density |
| LPSI | Low Pressure Safety Injection |
| LPZ | Low Population Zone |
| LSSS | Limiting Safety System Setting |
| MDNBR | Minimum Departure from Nucleate Boiling Ratio |
| MFIV | Main Feedwater Isolation Valve |
| MFW | Main Feedwater |
| MSIV | Main Steam Isolation Valve |
| MSLB | Main Steam Line Break |
| MSS | Main Steam System |
| MSSV | Main Steam Safety Valves |
| MTC | Moderator Temperature Coefficient |
| NRC | Nuclear Regulatory Commission |
| NSSS | Nuclear Steam Supply System |
| OSG | Original Steam Generator |
| PCT | Peak Clad Temperature |
| PD | Pump Discharge |
| PDIL | Power Dependent Insertion Limit |
| PIS | Preaccident Iodine Spike |
| PLCEA | Part-Length Control Element Assembly |
| PLCS | Pressurizer Level Control System |
| PLHGR | Peak Linear Heat Generation Rate |
| PORV | Power-Operated Relief Valve |
| PPCS | Pressurizer Pressure Control System |
| PSV | Pressurizer Safety Valves |
| PWR | Pressurized Water Reactor |
| RAS | Recirculation Actuation Signal |
| RCP | Reactor Coolant Pump |
| RCS | Reactor Coolant System |
| RPS | Reactor Protective System |
| RRS | Reactor Regulating System |
| RSG | Replacement Steam Generator |
| RTD | Resistance Temperature Detector |
| RTP | Rated Thermal Power |
| RWT | Refueling Water Tank |
| SAFDL | Specified Acceptable Fuel Design Limit |

CHAPTER 14
SAFETY ANALYSIS

LIST OF ACRONYMS

| | |
|------------------|--|
| SDBS | Steam Dump and Bypass System |
| SDC | Shutdown Cooling |
| SDCHX | Shutdown Cooling Heat Exchanger |
| SER | Safety Evaluation Report |
| SFP | Spent Fuel Pool |
| SFPEVS | Spent Fuel Pool Exhaust Ventilation System |
| SG | Steam Generator |
| SGFP | Steam Generator Feedwater Pump |
| SGIS | Steam Generator Isolation Signal |
| SGTR | Steam Generator Tube Rupture |
| SI | Safety Injection |
| SIAS | Safety Injection Actuation Signal |
| SIT | Safety Injection Tank |
| SLB | Steam Line Break |
| SRP | Standard Review Plan |
| TBV | Turbine Bypass Valve |
| TEDE | Total Effective Dose Equivalent |
| TID | Technical Information Document |
| TM/LP | Thermal Margin/Low Pressure |
| UFSAR | Updated Final Safety Analysis Report |
| VAP | Value Added Pellet |
| VHPT | Variable High Power Trip |
| WBD | Whole Body Dose |
| ZrB ₂ | Zirc Dioxide |