

## MASTER TABLE OF CONTENTS

| <u>Section</u> | <u>Title</u>   | <u>Page</u> |
|----------------|--|-------------|
| 1.0            | <u>INTRODUCTION AND GENERAL DESCRIPTION OF PLANT</u>   | 1.0-1       |
| 1.1            | <u>INTRODUCTION</u>                                    | 1.1-1       |
| 1.2            | <u>GENERAL PLANT DESCRIPTION</u>                       | 1.2-1       |
| 1.2.1          | PRINCIPAL DESIGN CRITERIA                              | 1.2-1       |
| 1.2.2          | PLANT DESCRIPTION                                      | 1.2-14      |
| 1.2.3          | SYMBOLS USED IN ENGINEERING DRAWINGS                   | 1.2-45      |
| 1.3            | <u>COMPARISON TABLES</u>                               | 1.3-1       |
| 1.3.1          | COMPARISONS WITH SIMILAR FACILITY DESIGNS              | 1.3-1       |
| 1.3.2          | COMPARISON OF FINAL AND PRELIMINARY INFORMATION        | 1.3-2       |
| 1.4            | <u>IDENTIFICATION OF AGENTS AND CONTRACTORS</u>        | 1.4-1       |
| 1.4.1          | THE CLEVELAND ELECTRIC ILLUMINATING COMPANY - OWNER    | 1.4-1       |
| 1.4.2          | GILBERT ASSOCIATES, INC. - ARCHITECT/ENGINEER          | 1.4-2       |
| 1.4.3          | GENERAL ELECTRIC COMPANY - NUCLEAR STEAM SUPPLY SYSTEM | 1.4-3       |
| 1.4.4          | RAYMOND KAISER ENGINEERS, INC.                         | 1.4-4       |
| 1.4.5          | GENERAL ELECTRIC COMPANY - TURBINE GENERATOR VENDOR    | 1.4-4       |
| 1.4.6          | NUS CORPORATION - ENVIRONMENTAL CONSULTANT             | 1.4-5       |
| 1.4.7          | OTHER CONSULTANTS                                      | 1.4-6       |
| 1.5            | <u>REQUIREMENTS FOR FURTHER TECHNICAL INFORMATION</u>  | 1.5-1       |
| 1.5.1          | CURRENT DEVELOPMENT PROGRAMS                           | 1.5-1       |
| 1.6            | <u>REFERENCE MATERIALS</u>                             | 1.6-1       |
| 1.7            | <u>DRAWINGS AND OTHER DETAILED INFORMATION</u>         | 1.7-1       |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>   | <u>Page</u>    |
|----------------|--|----------------|
| 1.7.1          | ELECTRICAL, INSTRUMENTATION, AND CONTROL DRAWINGS  | 1.7-1          |
| 1.7.2          | PIPING AND INSTRUMENTATION DIAGRAMS  | 1.7-1          |
| 1.7.3          | OTHER DETAILED INFORMATION   | 1.7-1          |
| 1.8            | <u>NRC REGULATORY GUIDE ASSESSMENT</u>   | 1.8-1          |
| 1.9            | <u>STANDARD DESIGNS</u>  | 1.9-1          |
| 1.10           | <u>EVALUATION OF UNIT 1 OPERATIONS RESULTING FROM UNIT 2 CONSTRUCTION ACTIVITIES</u>       | 1.10-1         |
| APPENDIX 1A    | <u>NUREG-0737 "TMI ACTION PLAN REQUIREMENTS FOR APPLICANTS FOR NEW OPERATING LICENSES"</u> | APP. 1A<br>TAB |
| APPENDIX 1B    | <u>PNPP LICENSE COMMITMENTS</u>  | APP. 1B<br>TAB |
| 2.0            | <u>SITE CHARACTERISTICS</u>  | 2.0-1          |
| 2.1            | <u>GEOGRAPHY AND DEMOGRAPHY</u>  | 2.1-1          |
| 2.1.1          | SITE LOCATION AND DESCRIPTION  | 2.1-1          |
| 2.1.2          | EXCLUSION AREA AUTHORITY AND CONTROL   | 2.1-3          |
| 2.1.3          | POPULATION DISTRIBUTION  | 2.1-5          |
| 2.1.4          | REFERENCES FOR SECTION 2.1   | 2.1-11         |
| 2.2            | <u>NEARBY INDUSTRIAL, TRANSPORTATION AND MILITARY FACILITIES</u>                           | 2.2-1          |
| 2.2.1          | LOCATIONS AND ROUTES   | 2.2-1          |
| 2.2.2          | DESCRIPTIONS   | 2.2-4          |
| 2.2.3          | EVALUATION OF POTENTIAL ACCIDENTS  | 2.2-21         |
| 2.2.4          | REFERENCES FOR SECTION 2.2   | 2.2-39         |
| 2.3            | <u>METEOROLOGY</u>   | 2.3-1          |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>  | <u>Page</u> |
|----------------|---|-------------|
| 2.3.1          | REGIONAL CLIMATOLOGY  | 2.3-1       |
| 2.3.2          | LOCAL METEOROLOGY   | 2.3-17      |
| 2.3.3          | ONSITE METEOROLOGICAL MEASUREMENT PROGRAM   | 2.3-31      |
| 2.3.4          | SHORT TERM (ACCIDENT) DIFFUSION ESTIMATES   | 2.3-40      |
| 2.3.5          | LONG TERM (ROUTINE RELEASE) DIFFUSION ESTIMATES   | 2.3-43      |
| 2.3.6          | REFERENCES FOR SECTION 2.3  | 2.3-47      |
| 2.4            | <u>HYDROLOGIC ENGINEERING</u>   | 2.4-1       |
| 2.4.1          | HYDROLOGIC DESCRIPTION  | 2.4-1       |
| 2.4.2          | FLOODS  | 2.4-4       |
| 2.4.3          | PROBABLE MAXIMUM FLOOD (PMF) ON STREAMS AND RIVERS  | 2.4-7       |
| 2.4.4          | POTENTIAL DAM FAILURES, SEISMICALLY INDUCED   | 2.4-11      |
| 2.4.5          | PROBABLE MAXIMUM SURGE FLOODING   | 2.4-12      |
| 2.4.6          | PROBABLE MAXIMUM TSUNAMI FLOODING   | 2.4-45      |
| 2.4.7          | ICE EFFECTS   | 2.4-45      |
| 2.4.8          | COOLING WATER TUNNELS AND OFFSHORE STRUCTURES   | 2.4-47      |
| 2.4.9          | CHANNEL DIVERSIONS  | 2.4-50      |
| 2.4.10         | FLOODING PROTECTION REQUIREMENTS  | 2.4-50      |
| 2.4.11         | LOW WATER CONSIDERATIONS  | 2.4-51      |
| 2.4.12         | DISPERSION, DILUTION, AND TRAVEL TIMES OF ACCIDENTAL RELEASES OF RADIOACTIVE EFFLUENTS IN LAKE ERIE | 2.4-62      |
| 2.4.13         | GROUNDWATER   | 2.4-65      |
| 2.4.14         | TECHNICAL SPECIFICATION AND EMERGENCY OPERATION REQUIREMENTS  | 2.4-117     |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>   | <u>Page</u>    |
|----------------|--|----------------|
| 2.4.15         | LIST OF PERSONS AND AGENCIES INTERVIEWED   | 2.4-117        |
| 2.4.16         | REFERENCES FOR SECTION 2.4   | 2.4-120        |
| 2.5            | <u>GEOLOGY, SEISMOLOGY AND GEOTECHNICAL<br/>ENGINEERING</u>                      | 2.5-1          |
| 2.5.1          | BASIC GEOLOGIC AND SEISMIC INFORMATION   | 2.5-7          |
| 2.5.2          | VIBRATORY GROUND MOTION  | 2.5-117        |
| 2.5.3          | SURFACE FAULTING   | 2.5-167        |
| 2.5.4          | STABILITY OF SUBSURFACE MATERIALS AND<br>FOUNDATIONS                             | 2.5-181        |
| 2.5.5          | STABILITY OF SLOPES  | 2.5-265        |
| 2.5.6          | EMBANKMENTS AND DAMS   | 2.5-270        |
| 2.5.7          | REFERENCES FOR SECTION 2.5   | 2.5-270        |
| APPENDIX 2A    | <u>ANNUAL JOINT FREQUENCY DISTRIBUTIONS FOR<br/>CLEVELAND AND ERIE</u>           | APP. 2A<br>TAB |
| APPENDIX 2B    | <u>MONTHLY AND ANNUAL JOINT FREQUENCY<br/>DISTRIBUTIONS FOR PNPP, 10-M WINDS</u> | APP. 2B<br>TAB |
| APPENDIX 2C    | <u>MONTHLY AND ANNUAL JOINT FREQUENCY<br/>DISTRIBUTIONS FOR PNPP, 60-M WINDS</u> | APP. 2C<br>TAB |
| APPENDIX 2D    | <u>BEDROCK DEFORMATION IN THE COOLING WATER<br/>TUNNEL</u>                       | APP. 2D<br>TAB |
| APPENDIX 2E    | <u>SOIL AND ROCK BORINGS</u>   | APP. 2E<br>TAB |
| 3.0            | <u>DESIGN OF STRUCTURES, COMPONENTS, EQUIPMENT<br/>AND SYSTEMS</u>               | 3.1-1          |
| 3.1            | <u>CONFORMANCE WITH NRC GENERAL DESIGN CRITERIA</u>                              | 3.1-1          |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>   | <u>Page</u> |
|----------------|--|-------------|
| 3.1.1          | SUMMARY DESCRIPTION  | 3.1-1       |
| 3.1.2          | CRITERION CONFORMANCE  | 3.1-2       |
| 3.2            | <u>CLASSIFICATION OF STRUCTURES, COMPONENTS<br/>AND SYSTEMS</u>                          | 3.2-1       |
| 3.2.1          | SEISMIC CLASSIFICATION   | 3.2-1       |
| 3.2.2          | SYSTEM QUALITY GROUP CLASSIFICATIONS   | 3.2-3       |
| 3.2.3          | SYSTEM SAFETY CLASSIFICATIONS  | 3.2-3       |
| 3.2.4          | QUALITY ASSURANCE  | 3.2-9       |
| 3.2.5          | CORRELATION OF SAFETY CLASSES WITH INDUSTRY<br>CODES                                     | 3.2-10      |
| 3.3            | <u>WIND AND TORNADO LOADS</u>  | 3.3-1       |
| 3.3.1          | WIND LOADINGS  | 3.3-1       |
| 3.3.2          | TORNADO LOADINGS   | 3.3-3       |
| 3.3.3          | REFERENCES FOR SECTION 3.3   | 3.3-7       |
| 3.4            | <u>WATER LEVEL (FLOOD) DESIGN</u>  | 3.4-1       |
| 3.4.1          | FLOOD PROTECTION   | 3.4-1       |
| 3.4.2          | ANALYTICAL AND TEST PROCEDURES   | 3.4-3       |
| 3.4.3          | FLOOD FORCE APPLICATION  | 3.4-4       |
| 3.5            | <u>MISSILE PROTECTION</u>  | 3.5-1       |
| 3.5.1          | MISSILE SELECTION AND DESCRIPTION  | 3.5-1       |
| 3.5.2          | STRUCTURES, SYSTEMS AND COMPONENTS TO BE<br>PROTECTED FROM EXTERNALLY GENERATED MISSILES | 3.5-19      |
| 3.5.3          | BARRIER DESIGN PROCEDURES  | 3.5-20      |
| 3.5.4          | REFERENCES FOR SECTION 3.5   | 3.5-22      |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>  | <u>Page</u> |
|----------------|---|-------------|
| 3.6            | <u>PROTECTION AGAINST DYNAMIC EFFECTS ASSOCIATED<br/>WITH THE POSTULATED RUPTURE OF PIPING</u>              | 3.6-1       |
| 3.6.1          | POSTULATED PIPING FAILURES IN FLUID SYSTEMS   | 3.6-1       |
| 3.6.2          | DETERMINATION OF BREAK LOCATIONS AND DYNAMIC<br>EFFECTS ASSOCIATED WITH THE POSTULATED<br>RUPTURE OF PIPING | 3.6-9       |
| 3.6.3          | REFERENCES FOR SECTION 3.6  | 3.6-83      |
| 3.7            | <u>SEISMIC DESIGN</u>   | 3.7-1       |
| 3.7.1          | SEISMIC INPUT   | 3.7-1       |
| 3.7.2          | SEISMIC SYSTEM ANALYSIS   | 3.7-5       |
| 3.7.3          | SEISMIC SUBSYSTEM ANALYSIS  | 3.7-25      |
| 3.7.4          | SEISMIC INSTRUMENTATION   | 3.7-44      |
| 3.7.5          | REFERENCES FOR SECTION 3.7  | 3.7-53      |
| 3.8            | <u>DESIGN OF CATEGORY I STRUCTURES</u>  | 3.8-1       |
| 3.8.0          | GENERAL DESCRIPTION   | 3.8-1       |
| 3.8.1          | CONCRETE CONTAINMENT  | 3.8.4       |
| 3.8.2          | STEEL CONTAINMENT   | 3.8-95      |
| 3.8.3          | INTERNAL CONCRETE AND STEEL STRUCTURES  | 3.8-147     |
| 3.8.4          | OTHER SEISMIC CATEGORY I STRUCTURES   | 3.8-199     |
| 3.8.5          | FOUNDATIONS AND CONCRETE SUPPORTS   | 3.8-273     |
| 3.8.6          | REFERENCES FOR SECTION 3.8  | 3.8-291     |
| 3.9            | <u>MECHANICAL SYSTEMS AND COMPONENTS</u>  | 3.9-1       |
| 3.9.1          | SPECIAL TOPICS FOR MECHANICAL COMPONENTS  | 3.9-1       |
| 3.9.2          | DYNAMIC TESTING AND ANALYSIS  | 3.9-50      |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>  | <u>Page</u> |
|----------------|---|-------------|
| 3.9.3          | ASME CODE CLASS 1, 2, AND 3 COMPONENTS,<br>COMPONENT SUPPORTS AND CORE SUPPORT STRUCTURES                             | 3.9-99      |
| 3.9.4          | CONTROL ROD DRIVE SYSTEM  | 3.9-148     |
| 3.9.5          | REACTOR PRESSURE VESSEL INTERNALS   | 3.9-151     |
| 3.9.6          | INSERVICE TESTING OF PUMPS AND VALVES   | 3.9-170     |
| 3.9.7          | REFERENCES FOR SECTION 3.9  | 3.9-170     |
| 3.10           | <u>SEISMIC AND DYNAMIC QUALIFICATION OF<br/>MECHANICAL AND ELECTRICAL EQUIPMENT</u>                                   | 3.10-1      |
| 3.10.1         | SEISMIC AND DYNAMIC QUALIFICATION CRITERIA  | 3.10-3      |
| 3.10.2         | METHODS AND PROCEDURES FOR SEISMIC AND<br>DYNAMIC QUALIFICATION OF MECHANICAL AND<br>ELECTRICAL EQUIPMENT             | 3.10-9      |
| 3.10.3         | METHODS AND PROCEDURES FOR SEISMIC AND<br>DYNAMIC QUALIFICATION OF SUPPORTS OF<br>MECHANICAL AND ELECTRICAL EQUIPMENT | 3.10-17     |
| 3.10.4         | SEISMIC AND DYNAMIC QUALIFICATION RESULTS   | 3.10-22     |
| 3.10.5         | REFERENCES FOR SECTION 3.10   | 3.10-23     |
| 3.11           | <u>ENVIRONMENTAL QUALIFICATION OF MECHANICAL<br/>AND ELECTRICAL EQUIPMENT</u>   | 3.11-1      |
| 3.11.1         | EQUIPMENT IDENTIFICATION AND ENVIRONMENTAL<br>CONDITIONS  | 3.11-1      |
| 3.11.2         | ENVIRONMENTAL QUALIFICATION PROGRAM<br>ACCEPTANCE CRITERIA  | 3.11-6      |
| 3.11.3         | QUALIFICATION TESTS RESULTS   | 3.11-33     |
| 3.11.4         | LOSS OF VENTILATION   | 3.11-36     |
| 3.11.5         | ESTIMATED CHEMICAL AND RADIATION ENVIRONMENT  | 3.11-40     |
| 3.11.6         | REFERENCES FOR SECTION 3.11   | 3.11-43     |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>                               | <u>Page</u>    |
|----------------|--|----------------|
| APPENDIX 3A    | <u>HYDRODYNAMIC LOADS FOR PNPP</u>         | APP. 3A<br>TAB |
| APPENDIX 3B    | <u>CONTAINMENT LOADS</u>                   | APP. 3B<br>TAB |
| 4.0            | <u>REACTOR</u>                             | 4.0-1          |
| 4.1            | <u>SUMMARY DESCRIPTION</u>                 | 4.1-1          |
| 4.1.1          | REACTOR VESSEL                             | 4.1-1          |
| 4.1.2          | REACTOR INTERNAL COMPONENTS                | 4.1-1          |
| 4.1.3          | REACTIVITY CONTROL SYSTEMS                 | 4.1-8          |
| 4.1.4          | ANALYSIS TECHNIQUES                        | 4.1-9          |
| 4.1.5          | REFERENCES FOR SECTION 4.1                 | 4.1-14         |
| 4.2            | <u>FUEL SYSTEM DESIGN</u>                  | 4.2-1          |
| 4.2.1          | GENERAL AND DETAILED DESIGN BASES          | 4.2-1          |
| 4.2.2          | DESCRIPTION AND DESIGN DRAWINGS            | 4.2-1          |
| 4.2.3          | DESIGN EVALUATIONS                         | 4.2-5          |
| 4.2.4          | TESTING, INSPECTION AND SURVEILLANCE PLANS | 4.2-6          |
| 4.2.5          | OPERATING AND DEVELOPMENTAL EXPERIENCE     | 4.2-6          |
| 4.2.6          | REFERENCES FOR SECTION 4.2                 | 4.2-6          |
| 4.3            | <u>NUCLEAR DESIGN</u>                      | 4.3-1          |
| 4.3.1          | DESIGN BASES                               | 4.3-1          |
| 4.3.2          | DESCRIPTION                                | 4.3-1          |
| 4.3.3          | ANALYTICAL METHODS                         | 4.3-12         |
| 4.3.4          | CHANGES                                    | 4.3-12         |
| 4.3.5          | REFERENCES FOR SECTION 4.3                 | 4.3-13         |



MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>  | <u>Page</u> |
|----------------|---|-------------|
| 4.4            | <u>THERMAL AND HYDRAULIC DESIGN</u>   | 4.4-1       |
| 4.4.1          | DESIGN BASIS  | 4.4-1       |
| 4.4.2          | DESCRIPTION OF THERMAL-HYDRAULIC DESIGN OF THE REACTOR CORE                   | 4.4-2       |
| 4.4.3          | DESCRIPTION OF THE THERMAL AND HYDRAULIC DESIGN OF THE REACTOR COOLANT SYSTEM | 4.4-4       |
| 4.4.4          | EVALUATION  | 4.4-10      |
| 4.4.5          | TESTING AND VERIFICATION  | 4.4-11      |
| 4.4.6          | INSTRUMENTATION REQUIREMENTS  | 4.4-12      |
| 4.5            | <u>REACTOR MATERIALS</u>  | 4.5-1       |
| 4.5.1          | CONTROL ROD DRIVE SYSTEM STRUCTURAL MATERIALS                                 | 4.5-1       |
| 4.5.2          | REACTOR INTERNAL MATERIALS  | 4.5-8       |
| 4.5.3          | CONTROL ROD DRIVE HOUSING SUPPORTS  | 4.5-14      |
| 4.5.4          | REFERENCES FOR SECTION 4.5  | 4.5-15      |
| 4.6            | <u>FUNCTIONAL DESIGN OF REACTIVITY CONTROL SYSTEMS</u>                        | 4.6-1       |
| 4.6.1          | INFORMATION FOR CRDS  | 4.6-1       |
| 4.6.2          | EVALUATIONS OF THE CRDS   | 4.6-25      |
| 4.6.3          | TESTING AND VERIFICATION OF THE CRDS  | 4.6-43      |
| 4.6.4          | INFORMATION FOR COMBINED PERFORMANCE OF REACTIVITY CONTROL SYSTEMS            | 4.6-50      |
| 4.6.5          | EVALUATION OF COMBINED PERFORMANCE  | 4.6-51      |
| 4.6.6          | REFERENCES FOR SECTION 4.6  | 4.6-61      |
| 5.0            | <u>REACTOR COOLANT SYSTEM AND CONNECTED SYSTEMS</u>                           | 5.1-1       |
| 5.1            | <u>SUMMARY DESCRIPTION</u>  | 5.1-1       |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>   | <u>Page</u> |
|----------------|--|-------------|
| 5.1.1          | SCHEMATIC FLOW DIAGRAM   | 5.1-4       |
| 5.1.2          | PIPING AND INSTRUMENTATION DIAGRAM   | 5.1-4       |
| 5.1.3          | ELEVATION DRAWINGS   | 5.1-5       |
| 5.2            | <u>INTEGRITY OF REACTOR COOLANT PRESSURE BOUNDARY</u>                              | 5.2-1       |
| 5.2.1          | COMPLIANCE WITH CODES AND CODE CASES   | 5.2-1       |
| 5.2.2          | OVERPRESSURIZATION PROTECTION  | 5.2-4       |
| 5.2.3          | REACTOR COOLANT PRESSURE BOUNDARY MATERIALS  | 5.2-25      |
| 5.2.4          | INSERVICE EXAMINATION AND PRESSURE TESTING OF<br>REACTOR COOLANT PRESSURE BOUNDARY | 5.2-43      |
| 5.2.5          | DETECTION OF LEAKAGE THROUGH REACTOR COOLANT<br>PRESSURE BOUNDARY                  | 5.2-53      |
| 5.2.6          | REFERENCES FOR SECTION 5.2   | 5.2-79      |
| 5.3            | <u>REACTOR VESSEL</u>  | 5.3-1       |
| 5.3.1          | REACTOR VESSEL MATERIALS   | 5.3-1       |
| 5.3.2          | PRESSURE-TEMPERATURE LIMITS  | 5.3-13      |
| 5.3.3          | REACTOR VESSEL INTEGRITY   | 5.3-16      |
| 5.3.4          | REFERENCES FOR SECTION 5.3   | 5.3-28      |
| 5.4            | <u>COMPONENT AND SUBSYSTEM DESIGN</u>  | 5.4-1       |
| 5.4.1          | REACTOR RECIRCULATION PUMPS  | 5.4-1       |
| 5.4.2          | STEAM GENERATORS (PWR)   | 5.4-8       |
| 5.4.3          | REACTOR COOLANT PIPING   | 5.4-8       |
| 5.4.4          | MAIN STEAM LINE FLOW RESTRICTORS   | 5.4-8       |
| 5.4.5          | MAIN STEAM LINE ISOLATION SYSTEM   | 5.4-11      |
| 5.4.6          | REACTOR CORE ISOLATION COOLING SYSTEM  | 5.4-20      |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>                               | <u>Page</u> |
|----------------|--|-------------|
| 5.4.7          | RESIDUAL HEAT REMOVAL SYSTEM               | 5.4-39      |
| 5.4.8          | REACTOR WATER CLEANUP SYSTEM               | 5.4-55      |
| 5.4.9          | MAIN STEAM LINE AND FEEDWATER PIPING       | 5.4-60      |
| 5.4.10         | PRESSURIZER                                | 5.4-62      |
| 5.4.11         | PRESSURIZER RELIEF DISCHARGE SYSTEM        | 5.4-62      |
| 5.4.12         | VALVES                                     | 5.4-62      |
| 5.4.13         | SAFETY AND RELIEF VALVES                   | 5.4-65      |
| 5.4.14         | COMPONENT SUPPORTS                         | 5.4-66      |
| 5.4.15         | REFERENCES FOR SECTION 5.4                 | 5.4-68      |
| 6.0            | <u>ENGINEERED SAFETY FEATURES</u>          | 6.1-1       |
| 6.1            | <u>ENGINEERED SAFETY FEATURE MATERIALS</u> | 6.1-1       |
| 6.1.1          | METALLIC MATERIALS                         | 6.1-1       |
| 6.1.2          | ORGANIC MATERIALS                          | 6.1-7       |
| 6.1.3          | REFERENCES FOR SECTION 6.1                 | 6.1-9       |
| 6.2            | <u>CONTAINMENT SYSTEMS</u>                 | 6.2-1       |
| 6.2.1          | CONTAINMENT FUNCTIONAL DESIGN              | 6.2-1       |
| 6.2.2          | CONTAINMENT HEAT REMOVAL SYSTEM            | 6.2-59      |
| 6.2.3          | SECONDARY CONTAINMENT FUNCTIONAL DESIGN    | 6.2-70      |
| 6.2.4          | CONTAINMENT ISOLATION SYSTEM               | 6.2-78      |
| 6.2.5          | COMBUSTIBLE GAS CONTROL IN CONTAINMENT     | 6.2-112     |
| 6.2.6          | CONTAINMENT LEAKAGE TESTING                | 6.2-126     |
| 6.2.7          | SUPPRESSION POOL MAKEUP SYSTEM             | 6.2-132     |
| 6.2.8          | HYDROGEN CONTROL SYSTEM                    | 6.2-142     |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>  | <u>Page</u> |
|----------------|---|-------------|
| 6.2.9          | REFERENCES FOR SECTION 6.2                              | 6.2-150     |
| 6.3            | <u>EMERGENCY CORE COOLING SYSTEM</u>                    | 6.3-1       |
| 6.3.1          | DESIGN BASES AND SUMMARY DESCRIPTION                    | 6.3-1       |
| 6.3.2          | SYSTEM DESIGN   | 6.3-9       |
| 6.3.3          | PERFORMANCE EVALUATION                                  | 6.3-39      |
| 6.3.4          | TESTS AND INSPECTIONS                                   | 6.3-52      |
| 6.3.5          | INSTRUMENTATION REQUIREMENTS                            | 6.3-57      |
| 6.3.6          | REFERENCES FOR SECTION 6.3                              | 6.3-58      |
| 6.4            | <u>HABITABILITY SYSTEMS</u>                             | 6.4-1       |
| 6.4.1          | DESIGN BASES  | 6.4-1       |
| 6.4.2          | SYSTEM DESIGN   | 6.4-4       |
| 6.4.3          | SYSTEM OPERATIONAL PROCEDURES                           | 6.4-12      |
| 6.4.4          | DESIGN EVALUATION                                       | 6.4-14      |
| 6.4.5          | TESTING AND INSPECTION                                  | 6.4-18      |
| 6.4.6          | INSTRUMENTATION REQUIREMENTS                            | 6.4-19a     |
| 6.5            | <u>FISSION PRODUCT REMOVAL AND CONTROL SYSTEMS</u>      | 6.5-1       |
| 6.5.1          | ENGINEERED SAFETY FEATURES (ESF) FILTER SYSTEMS         | 6.5-1       |
| 6.5.2          | CONTAINMENT SPRAY SYSTEM                                | 6.5-9       |
| 6.5.3          | FISSION PRODUCT CONTROL SYSTEMS                         | 6.5-15      |
| 6.5.4          | ICE CONDENSER AS A FISSION PRODUCT CLEANUP<br>SYSTEM    | 6.5-24      |
| 6.5.5          | REFERENCES FOR SECTION 6.5                              | 6.5-24      |
| 6.6            | <u>INSERVICE INSPECTION OF CLASS 2 AND 3 COMPONENTS</u> | 6.6-1       |
| 6.6.1          | COMPONENTS SUBJECT TO EXAMINATION                       | 6.6-1       |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>  | <u>Page</u> |
|----------------|---|-------------|
| 6.6.2          | ACCESSIBILITY   | 6.6-1       |
| 6.6.3          | EXAMINATION TECHNIQUES AND PROCEDURES   | 6.6-1       |
| 6.6.4          | INSPECTION INTERVALS  | 6.6-2       |
| 6.6.5          | EXAMINATION CATEGORIES AND REQUIREMENTS   | 6.6-2       |
| 6.6.6          | EVALUATION OF EXAMINATION RESULTS   | 6.6-2       |
| 6.6.7          | SYSTEM PRESSURE TESTS   | 6.6-3       |
| 6.6.8          | AUGMENTED INSERVICE INSPECTION TO PROTECT<br>AGAINST POSTULATED PIPING FAILURES | 6.6-3       |
| 6.7            | <u>MAIN STEAM LINE ISOLATION VALVE LEAKAGE<br/>CONTROL SYSTEM</u>               | 6.7-1       |
| 6.8            | <u>SAFETY-RELATED INSTRUMENT AIR SYSTEM</u>                                     | 6.8-1       |
| 6.8.1          | DESIGN BASES  | 6.8-1       |
| 6.8.2          | SYSTEM DESIGN   | 6.8-1       |
| 6.8.3          | DESIGN EVALUATION   | 6.8-3       |
| 6.8.4          | TESTS AND INSPECTIONS   | 6.8-4       |
| 6.8.5          | INSTRUMENTATION REQUIREMENTS  | 6.8-5       |
| 6.9            | <u>FEEDWATER LEAKAGE CONTROL SYSTEM</u>   | 6.9-1       |
| 6.9.1          | DESIGN BASES  | 6.9-1       |
| 6.9.2          | SYSTEM DESCRIPTION  | 6.9-2       |
| 6.9.3          | DESIGN EVALUATION   | 6.9-5       |
| 6.9.4          | TESTS AND INSPECTIONS   | 6.9-6       |
| 6.9.5          | INSTRUMENTATION REQUIREMENTS  | 6.9-6       |
| 7.0            | <u>INSTRUMENTATION AND CONTROLS SYSTEMS</u>                                     | 7.1-1       |
| 7.1            | <u>INTRODUCTION</u>   | 7.1-1       |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>   | <u>Page</u> |
|----------------|--|-------------|
| 7.1.1          | IDENTIFICATION OF SAFETY-RELATED SYSTEMS                     | 7.1-1       |
| 7.1.2          | IDENTIFICATION OF SAFETY CRITERIA                            | 7.1-7       |
| 7.1.3          | PLANT PROTECTION SYSTEM-ELECTRONIC TRIP SYSTEM               | 7.1-17      |
| 7.2            | <u>REACTOR TRIP SYSTEM - REACTOR PROTECTION SYSTEM (RPS)</u> | 7.2-1       |
| 7.2.1          | DESCRIPTION  | 7.2-1       |
| 7.2.2          | ANALYSIS   | 7.2-22      |
| 7.3            | <u>ENGINEERED SAFETY FEATURE SYSTEMS</u>                     | 7.3-1       |
| 7.3.1          | DESCRIPTION  | 7.3-1       |
| 7.3.2          | ANALYSIS   | 7.3-68      |
| 7.4            | <u>SYSTEMS REQUIRED FOR SAFE SHUTDOWN</u>                    | 7.4-1       |
| 7.4.1          | DESCRIPTION  | 7.4-1       |
| 7.4.2          | ANALYSIS   | 7.4-27      |
| 7.5            | <u>SAFETY-RELATED DISPLAY INSTRUMENTATION</u>                | 7.5-1       |
| 7.5.1          | DESCRIPTION  | 7.5-1       |
| 7.5.2          | ANALYSIS   | 7.5-11      |
| 7.6            | <u>ALL OTHER INSTRUMENTATION SYSTEMS REQUIRED FOR SAFETY</u> | 7.6-1       |
| 7.6.1          | DESCRIPTION  | 7.6-1       |
| 7.6.2          | ANALYSIS   | 7.6-48      |
| 7.7            | <u>CONTROL SYSTEMS NOT REQUIRED FOR SAFETY</u>               | 7.7-1       |
| 7.7.1          | DESCRIPTION  | 7.7-1       |
| 7.7.2          | ANALYSIS   | 7.7-50      |
| 8.0            | <u>ELECTRIC POWER</u>  | 8.1-1       |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>  | <u>Page</u> |
|----------------|---|-------------|
| 8.1            | INTRODUCTION  | 8.1-1       |
| 8.1.1          | SAFETY LOADS  | 8.1-2       |
| 8.1.2          | REFERENCES FOR SECTION 8.1  | 8.1-3       |
| 8.2            | <u>OFFSITE POWER SYSTEM</u>   | 8.2-1       |
| 8.2.1          | DESCRIPTION   | 8.2-1       |
| 8.2.2          | ANALYSIS  | 8.2-6       |
| 8.3            | <u>ONSITE POWER SYSTEMS</u>   | 8.3-1       |
| 8.3.1          | AC POWER SYSTEMS  | 8.3-1       |
| 8.3.2          | DC POWER SYSTEMS  | 8.3-90      |
| 8.3.3          | FIRE PROTECTION FOR CABLE SYSTEMS   | 8.3-100     |
| 8.3.4          | REFERENCES FOR SECTION 8.3  | 8.3-101     |
| 9.0            | <u>AUXILIARY SYSTEMS</u>  | 9.1-1       |
| 9.1            | <u>FUEL STORAGE AND HANDLING</u>  | 9.1-1       |
| 9.1.1          | NEW FUEL STORAGE  | 9.1-1       |
| 9.1.2          | SPENT FUEL STORAGE  | 9.1-8       |
| 9.1.3          | SPENT FUEL POOL COOLING AND CLEANUP SYSTEM  | 9.1-29      |
| 9.1.4          | FUEL HANDLING SYSTEM  | 9.1-41      |
| 9.1.5          | CONTROL OF HEAVY LOADS OVER OR NEAR SPENT<br>FUEL AND OTHER CRITICAL PLANT SYSTEMS/COMPONENTS | 9.1-82      |
| 9.1.6          | REFERENCES FOR SECTION 9.1  | 9.1-83      |
| 9.2            | <u>WATER SYSTEMS</u>  | 9.2-1       |
| 9.2.1          | EMERGENCY SERVICE WATER SYSTEM  | 9.2-1       |
| 9.2.2          | EMERGENCY CLOSED COOLING SYSTEMS  | 9.2-23      |
| 9.2.3          | DEMINERALIZED WATER MAKEUP SYSTEM   | 9.2-35      |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>  | <u>Page</u> |
|----------------|---|-------------|
| 9.2.4          | POTABLE WATER SYSTEM  | 9.2-37      |
| 9.2.5          | ULTIMATE HEAT SINK  | 9.2-39      |
| 9.2.6          | CONDENSATE STORAGE FACILITIES                                     | 9.2-43      |
| 9.2.7          | SERVICE WATER SYSTEM  | 9.2-46      |
| 9.2.8          | NUCLEAR CLOSED COOLING SYSTEM                                     | 9.2-50      |
| 9.2.9          | TURBINE BUILDING CLOSED COOLING SYSTEM                            | 9.2-60      |
| 9.2.10         | ALTERNATE DECAY HEAT REMOVAL SYSTEM                               | 9.2-64      |
| 9.3            | <u>PROCESS AUXILIARIES</u>  | 9.3-1       |
| 9.3.1          | COMPRESSED AIR SYSTEMS  | 9.3-1       |
| 9.3.2          | PROCESS SAMPLING SYSTEM   | 9.3-4       |
| 9.3.3          | EQUIPMENT AND FLOOR DRAINAGE SYSTEM                               | 9.3-11      |
| 9.3.4          | CHEMICAL AND VOLUME CONTROL SYSTEM                                | 9.3-23      |
| 9.3.5          | STANDBY LIQUID CONTROL (SLC) SYSTEM                               | 9.3-23      |
| 9.3.6          | POST ACCIDENT SAMPLING SYSTEM                                     | 9.3-37      |
| 9.3.7          | ZINC INJECTION SYSTEM   | 9.3-42      |
| 9.3.8          | HYDROGEN WATER CHEMISTRY SYSTEM                                   | 9.3-43      |
| 9.4            | <u>AIR CONDITIONING, HEATING, COOLING AND VENTILATING SYSTEMS</u> | 9.4-1       |
| 9.4.1          | CONTROL COMPLEX HVAC SYSTEMS                                      | 9.4-1       |
| 9.4.2          | FUEL HANDLING AREA VENTILATION SYSTEM                             | 9.4-20      |
| 9.4.3          | AUXILIARY AND RADWASTE AREA VENTILATION SYSTEMS                   | 9.4-27      |
| 9.4.4          | TURBINE BUILDING AREA VENTILATION SYSTEM                          | 9.4-44      |
| 9.4.5          | ENGINEERED SAFETY FEATURES VENTILATION SYSTEM                     | 9.4-55      |
| 9.4.6          | REACTOR BUILDING VENTILATION SYSTEMS                              | 9.4-68      |



MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>   | <u>Page</u>    |
|----------------|--|----------------|
| 9.4.7          | INTERMEDIATE BUILDING VENTILATION SYSTEM                     | 9.4-90         |
| 9.4.8          | TURBINE POWER COMPLEX VENTILATION SYSTEM                     | 9.4-99         |
| 9.4.9          | CHILLED WATER SYSTEMS  | 9.4-103        |
| 9.4.10         | BUILDING HEATING SYSTEM                                      | 9.4-117        |
| 9.4.11         | OFFGAS CHARCOAL VAULT REFRIGERATION<br>SYSTEM                | 9.4-127        |
| 9.4.12         | MISCELLANEOUS NONSAFETY HVAC SYSTEMS                         | 9.4-142        |
| 9.5            | <u>OTHER AUXILIARY SYSTEMS</u>                               | 9.5-1          |
| 9.5.1          | FIRE PROTECTION SYSTEM                                       | 9.5-1          |
| 9.5.2          | COMMUNICATIONS SYSTEMS                                       | 9.5-30         |
| 9.5.3          | LIGHTING SYSTEMS   | 9.5-35         |
| 9.5.4          | DIESEL GENERATOR FUEL OIL STORAGE AND<br>TRANSFER SYSTEM     | 9.5-41         |
| 9.5.5          | DIESEL GENERATOR COOLING WATER SYSTEM                        | 9.5-51         |
| 9.5.6          | DIESEL GENERATOR STARTING AIR SYSTEM                         | 9.5-58         |
| 9.5.7          | DIESEL GENERATOR LUBRICATION SYSTEM                          | 9.5-63         |
| 9.5.8          | DIESEL GENERATOR COMBUSTION AIR INTAKE<br>AND EXHAUST SYSTEM | 9.5-68         |
| 9.5.9          | HIGH PRESSURE CORE SPRAY DIESEL GENERATOR                    | 9.5-77         |
| 9.5.10         | AUXILIARY STEAM SYSTEM                                       | 9.5-107        |
| 9.5.11         | REFERENCES FOR SECTION 9.5                                   | 9.5-109        |
| APPENDIX 9A    | <u>FIRE PROTECTION EVALUATION REPORT</u>                     | APP. 9A<br>TAB |
| 10.0           | <u>STEAM AND POWER CONVERSION SYSTEM</u>                     | 10.1-1         |
| 10.1           | <u>SUMMARY DESCRIPTION</u>                                   | 10.1-1         |
| 10.2           | <u>TURBINE GENERATOR</u>                                     | 10.2-1         |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>   | <u>Page</u> |
|----------------|--|-------------|
| 10.2.1         | DESIGN BASES   | 10.2-1      |
| 10.2.2         | DESCRIPTION  | 10.2-2      |
| 10.2.3         | TURBINE DISK INTEGRITY                                     | 10.2-11     |
| 10.2.4         | EVALUATION   | 10.2-17     |
| 10.2.5         | HYDROGEN AND CARBON DIOXIDE SYSTEMS                        | 10.2-19     |
| 10.2.6         | REFERENCES FOR SECTION 10.2                                | 10.2-23     |
| 10.3           | <u>MAIN STEAM SUPPLY SYSTEM</u>                            | 10.3-1      |
| 10.3.1         | DESIGN BASES   | 10.3-1      |
| 10.3.2         | DESCRIPTION  | 10.3-2      |
| 10.3.3         | EVALUATION   | 10.3-2      |
| 10.3.4         | INSPECTION AND TESTING REQUIREMENTS                        | 10.3-3      |
| 10.3.5         | WATER CHEMISTRY (PWR)                                      | 10.3-4      |
| 10.3.6         | STEAM AND FEEDWATER SYSTEM MATERIALS                       | 10.3-4      |
| 10.4           | <u>OTHER FEATURES OF STEAM AND POWER CONVERSION SYSTEM</u> | 10.4-1      |
| 10.4.1         | MAIN CONDENSER   | 10.4-1      |
| 10.4.2         | MAIN CONDENSER EVACUATION SYSTEM                           | 10.4-9      |
| 10.4.3         | TURBINE GLAND SEALING SYSTEM                               | 10.4-12     |
| 10.4.4         | TURBINE BYPASS SYSTEM                                      | 10.4-16     |
| 10.4.5         | CIRCULATING WATER SYSTEM                                   | 10.4-21     |
| 10.4.6         | CONDENSATE CLEANUP SYSTEM                                  | 10.4-30     |
| 10.4.7         | CONDENSATE AND FEEDWATER SYSTEM                            | 10.4-36     |
| 10.4.8         | STEAM GENERATOR BLOWDOWN SYSTEM                            | 10.4-45     |
| 10.4.9         | AUXILIARY FEEDWATER SYSTEM                                 | 10.4-46     |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>   | <u>Page</u> |
|----------------|--|-------------|
| 10.4.10        | REFERENCES FOR SECTION 10.4                              | 10.4-46     |
| 11.0           | <u>RADIOACTIVE WASTE MANAGEMENT</u>                      | 11.1-1      |
| 11.1           | <u>SOURCE TERMS</u>                                      | 11.1-1      |
| 11.1.1         | FISSION PRODUCTS   | 11.1-2      |
| 11.1.2         | ACTIVATION PRODUCTS                                      | 11.1-10     |
| 11.1.3         | TRITIUM  | 11.1-11     |
| 11.1.4         | FUEL FISSION PRODUCTION INVENTORY AND FUEL<br>EXPERIENCE | 11.1-15     |
| 11.1.5         | PROCESS LEAKAGE SOURCES                                  | 11.1-16     |
| 11.1.6         | LIQUID RADWASTE SYSTEM                                   | 11.1-17     |
| 11.1.7         | RADIOACTIVE SOURCES IN THE GAS TREATMENT<br>SYSTEM       | 11.1-17     |
| 11.1.8         | SOURCE TERMS FOR COMPONENT FAILURES                      | 11.1-17     |
| 11.1.9         | REFERENCES FOR SECTION 11.1                              | 11.1-18     |
| 11.2           | <u>LIQUID WASTE MANAGEMENT SYSTEMS</u>                   | 11.2-1      |
| 11.2.1         | DESIGN BASES   | 11.2-1      |
| 11.2.2         | SYSTEM DESCRIPTION                                       | 11.2-7      |
| 11.2.3         | RADIOACTIVE RELEASES                                     | 11.2-21     |
| 11.2.4         | REFERENCES FOR SECTION 11.2                              | 11.2-22     |
| 11.3           | <u>GASEOUS WASTE MANAGEMENT SYSTEMS</u>                  | 11.3-1      |
| 11.3.1         | DESIGN BASES   | 11.3-1      |
| 11.3.2         | SYSTEM DESCRIPTION                                       | 11.3-3      |
| 11.3.3         | RADIOACTIVE RELEASES                                     | 11.3-23     |
| 11.3.4         | REFERENCES FOR SECTION 11.3                              | 11.3-25     |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>  | <u>Page</u> |
|----------------|---|-------------|
| 11.4           | <u>SOLID RADIOACTIVE WASTE MANAGEMENT SYSTEM</u>  | 11.4-1      |
| 11.4.1         | DESIGN BASES  | 11.4-1      |
| 11.4.2         | SYSTEM DESCRIPTION  | 11.4-4      |
| 11.4.3         | REFERENCES FOR SECTION 11.4   | 11.4-16     |
| 11.5           | <u>PROCESS AND EFFLUENT RADIOLOGICAL MONITORING<br/>AND SAMPLING SYSTEMS</u>                          | 11.5-1      |
| 11.5.1         | DESIGN BASES  | 11.5-1      |
| 11.5.2         | SYSTEM DESCRIPTION  | 11.5-6      |
| 11.5.3         | EFFLUENT MONITORING AND SAMPLING  | 11.5-21     |
| 11.5.4         | PROCESS MONITORING AND SAMPLING   | 11.5-22     |
| 12.0           | <u>RADIATION PROTECTION</u>   | 12.1-1      |
| 12.1           | <u>ENSURING THAT OCCUPATIONAL RADIATION EXPOSURES<br/>ARE AS LOW AS REASONABLY ACHIEVABLE (ALARA)</u> | 12.1-1      |
| 12.1.1         | POLICY CONSIDERATIONS   | 12.1-1      |
| 12.1.2         | DESIGN CONSIDERATIONS   | 12.1-2      |
| 12.1.3         | OPERATIONAL CONSIDERATIONS  | 12.1-7      |
| 12.2           | <u>RADIATION SOURCES</u>  | 12.2-1      |
| 12.2.1         | CONTAINED SOURCES   | 12.2-1      |
| 12.2.2         | AIRBORNE RADIOACTIVE MATERIAL SOURCES   | 12.2-11     |
| 12.2.3         | REFERENCES FOR SECTION 12.2   | 12.2-14     |
| 12.3           | <u>RADIATION PROTECTION DESIGN FEATURES</u>   | 12.3-1      |
| 12.3.1         | FACILITY DESIGN FEATURES  | 12.3-1      |
| 12.3.2         | SHIELDING   | 12.3-8      |
| 12.3.3         | VENTILATION   | 12.3-19     |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>   | <u>Page</u> |
|----------------|--|-------------|
| 12.3.4         | AREA RADIATION AND AIRBORNE RADIOACTIVITY<br>MONITORING INSTRUMENTATION  | 12.3-24     |
| 12.3.5         | REFERENCES FOR SECTION 12.3  | 12.3-68     |
| 12.4           | <u>DOSE ASSESSMENT</u>   | 12.4-1      |
| 12.4.1         | ESTIMATES OF PERSONNEL OCCUPANCY<br>REQUIREMENTS   | 12.4-1      |
| 12.4.2         | ESTIMATES OF ANNUAL PERSON-REM DOSES   | 12.4-2      |
| 12.4.3         | ESTIMATED INHALATION DOSES   | 12.4-3      |
| 12.4.4         | ESTIMATED ANNUAL DOSE OUTSIDE THE NUCLEAR<br>FACILITY AT THE BOUNDARY OF THE RESTRICTED AREA   | 12.4-5      |
| 12.4.5         | REFERENCES FOR SECTION 12.4  | 12.4-10     |
| 12.5           | <u>RADIATION PROTECTION PROGRAM</u>  | 12.5-1      |
| 12.5.1         | ORGANIZATION   | 12.5-1      |
| 12.5.2         | EQUIPMENT, INSTRUMENTATION AND FACILITIES  | 12.5-2      |
| 12.5.3         | HEALTH PHYSICS INSTRUCTIONS  | 12.5-9      |
| 12.6           | <u>DESIGN REVIEW OF PLANT SHIELDING FOR SPACES/<br/>SYSTEMS WHICH MAY BE USED IN POSTACCIDENT<br/>OPERATIONS OUTSIDE CONTAINMENT</u> | 12.6-1      |
| 12.6.1         | INTRODUCTION   | 12.6-1      |
| 12.6.2         | RADIOACTIVE SOURCE RELEASES  | 12.6-2      |
| 12.6.3         | RADIOACTIVE SOURCE DISTRIBUTION  | 12.6-3      |
| 12.6.4         | SYSTEMS CONTAINING RADIOACTIVE SOURCES   | 12.6-6      |
| 12.6.5         | SHIELDING REVIEW   | 12.6-8a     |
| 12.6.6         | AREAS REQUIRING PERSONNEL ACCESS   | 12.6-9      |
| 12.6.7         | POSTACCIDENT RADIATION ZONE DRAWINGS AND<br>SUMMARY  | 12.6-11     |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>                                  | <u>Page</u> |
|----------------|---|-------------|
| 12.6.8         | REFERENCES FOR SECTION 12.6                   | 12.6-11     |
| 13.0           | <u>CONDUCT OF OPERATIONS</u>                  | 13.1-1      |
| 13.1           | <u>ORGANIZATIONAL STRUCTURE OF APPLICANT</u>  | 13.1-1      |
| 13.1.1         | MANAGEMENT AND TECHNICAL SUPPORT ORGANIZATION | 13.1-1      |
| 13.1.2         | OPERATING ORGANIZATION                        | 13.1-14     |
| 13.1.3         | QUALIFICATIONS OF PERSONNEL                   | 13.1-25     |
| 13.1.4         | REFERENCES FOR SECTION 13.1                   | 13.1-26     |
| 13.2           | <u>TRAINING PROGRAM</u>                       | 13.2-1      |
| 13.2.1         | PERRY STAFF TRAINING PROGRAM                  | 13.2-1      |
| 13.2.2         | LICENSED OPERATOR TRAINING PROGRAM            | 13.2-2      |
| 13.2.3         | TRAINING PROGRAMS FOR NON-LICENSED PERSONNEL  | 13.2-9      |
| 13.2.4         | PLANT ACCESS TRAINING                         | 13.2-12     |
| 13.2.5         | FIRE PROTECTION TRAINING                      | 13.2-13     |
| 13.3           | <u>EMERGENCY PLANNING</u>                     | 13.3-1      |
| 13.3.1         | REFERENCE FOR SECTION 13.3                    | 13.3-2      |
| 13.4           | <u>REVIEW AND AUDIT</u>                       | 13.4-1      |
| 13.4.1         | PLANT OPERATIONS REVIEW COMMITTEE             | 13.4-2      |
| 13.4.2         | COMPANY NUCLEAR REVIEW BOARD                  | 13.4-2      |
| 13.4.3         | (DELETED)                                     | 13.4-3      |
| 13.4.4         | FENOC OVERSIGHT DEPARTMENT                    | 13.4-3      |
| 13.5           | <u>PLANT PROCEDURES</u>                       | 13.5-1      |
| 13.5.1         | PROCEDURES AND INSTRUCTIONS                   | 13.5-2      |
| 13.5.2         | OPERATING AND MAINTENANCE INSTRUCTIONS        | 13.5-5      |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>  | <u>Page</u> |
|----------------|---|-------------|
| 13.6           | <u>INDUSTRIAL SECURITY</u>  | 13.6-1      |
| 13.6.1         | SECURITY PLAN   | 13.6-1      |
| 13.6.2         | SECURITY ORGANIZATION   | 13.6-1      |
| 13.6.3         | SECURITY PROCEDURES   | 13.6-2      |
| 14.0           | <u>INITIAL TEST PROGRAM</u>   | 14.1-1      |
| 14.1           | <u>SPECIFIC INFORMATION TO BE INCLUDED<br/>IN PRELIMINARY SAFETY ANALYSIS REPORTS</u>                 | 14.1-1      |
| 14.2           | <u>PERRY NUCLEAR POWER PLANT TEST PROGRAM</u>   | 14.2-1      |
| 14.2.1         | SUMMARY OF TEST PROGRAM AND OBJECTIVES  | 14.2-1      |
| 14.2.2         | ORGANIZATION AND STAFFING   | 14.2-5      |
| 14.2.3         | TEST PROCEDURES   | 14.2-23     |
| 14.2.4         | CONDUCT OF TEST PROGRAM   | 14.2-25     |
| 14.2.5         | REVIEW, EVALUATION AND APPROVAL OF TEST RESULTS   | 14.2-28     |
| 14.2.6         | TEST RECORDS  | 14.2-30     |
| 14.2.7         | CONFORMANCE OF THE TEST PROGRAM WITH REGULATORY<br>GUIDES   | 14.2-30     |
| 14.2.8         | UTILIZATION OF REACTOR OPERATING AND TESTING<br>EXPERIENCES IN THE DEVELOPMENT OF THE TEST<br>PROGRAM | 14.2-30     |
| 14.2.9         | TRIAL USE OF PLANT OPERATING AND EMERGENCY<br>PROCEDURES  | 14.2-31     |
| 14.2.10        | INITIAL FUEL LOADING AND INITIAL CRITICALITY  | 14.2-31     |
| 14.2.11        | TEST PROGRAM SCHEDULE   | 14.2-33     |
| 14.2.12        | INDIVIDUAL TEST DESCRIPTIONS  | 14.2-34     |
| 15.0           | <u>ACCIDENT ANALYSIS</u>  | 15.0-1      |
| 15.0           | <u>GENERAL</u>  | 15.0-1      |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>   | <u>Page</u> |
|----------------|--|-------------|
| 15.0.1         | ANALYTICAL OBJECTIVE   | 15.0-2      |
| 15.0.2         | ANALYTICAL CATEGORIES  | 15.0-3      |
| 15.0.3         | EVENT EVALUATION   | 15.0-5      |
| 15.0.4         | NUCLEAR SAFETY OPERATIONAL ANALYSIS (NSOA)<br>RELATIONSHIP                             | 15.0-17a    |
| 15.0.5         | EXTENDED OPERATING DOMAINS AND MODES<br>OF OPERATION                                   | 15.0-18     |
| 15.0.6         | RELOAD SAFETY ANALYSIS   | 15.0-21     |
| 15.0.7         | REFERENCES FOR SECTION 15.0  | 15.0-23     |
| 15.1           | <u>DECREASE IN REACTOR COOLANT TEMPERATURE</u>   | 15.1-1      |
| 15.1.1         | LOSS OF FEEDWATER HEATING  | 15.1-1      |
| 15.1.2         | FEEDWATER CONTROLLER FAILURE - MAXIMUM DEMAND  | 15.1-8      |
| 15.1.3         | PRESSURE REGULATOR FAILURE - OPEN  | 15.1-13     |
| 15.1.4         | INADVERTENT SAFETY/RELIEF VALVE OPENING  | 15.1-20     |
| 15.1.5         | SPECTRUM OF STEAM SYSTEM PIPING FAILURES<br>INSIDE AND OUTSIDE OF CONTAINMENT IN A PWR | 15.1-23     |
| 15.1.6         | INADVERTENT RHR SHUTDOWN COOLING OPERATION   | 15.1-23     |
| 15.1.7         | REFERENCES FOR SECTION 15.1  | 15.1-25     |
| 15.2           | <u>INCREASE IN REACTOR PRESSURE</u>  | 15.2-1      |
| 15.2.1         | PRESSURE REGULATOR FAILURE - CLOSED  | 15.2-1      |
| 15.2.2         | GENERATOR LOAD REJECTION   | 15.2-7      |
| 15.2.3         | TURBINE TRIP   | 15.2-13     |
| 15.2.4         | MSIV CLOSURE   | 15.2-21     |
| 15.2.5         | LOSS OF CONDENSER VACUUM   | 15.2-30     |
| 15.2.6         | LOSS OF AC POWER   | 15.2-35     |



# MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>   | <u>Page</u> |
|----------------|--|-------------|
| 15.2.7         | LOSS OF FEEDWATER FLOW   | 15.2-41     |
| 15.2.8         | FEEDWATER LINE BREAK   | 15.2-45     |
| 15.2.9         | FAILURE OF RHR SHUTDOWN COOLING                                    | 15.2-45     |
| 15.2.10        | LOSS OF INSTRUMENT AIR   | 15.2-53     |
| 15.2.11        | REFERENCES FOR 15.2  | 15.2-55     |
| 15.3           | <u>DECREASE IN REACTOR COOLANT SYSTEM FLOW RATE</u>                | 15.3-1      |
| 15.3.1         | RECIRCULATION PUMP TRIP  | 15.3-1      |
| 15.3.2         | RECIRCULATION FLOW CONTROL FAILURE -<br>DECREASING FLOW            | 15.3-6      |
| 15.3.3         | RECIRCULATION PUMP SEIZURE   | 15.3-11     |
| 15.3.4         | RECIRCULATION PUMP SHAFT BREAK                                     | 15.3-15     |
| 15.3.5         | REFERENCES FOR SECTION 15.3  | 15.3-19     |
| 15.4           | <u>REACTIVITY AND POWER DISTRIBUTION ANOMALIES</u>                 | 15.4-1      |
| 15.4.1         | ROD WITHDRAWAL ERROR - LOW POWER                                   | 15.4-1      |
| 15.4.2         | ROD WITHDRAWAL ERROR AT POWER                                      | 15.4-6      |
| 15.4.3         | CONTROL ROD MALOPERATION (SYSTEM MALFUNCTION<br>OR OPERATOR ERROR) | 15.4-10     |
| 15.4.4         | ABNORMAL STARTUP OF IDLE RECIRCULATION PUMP                        | 15.4-10     |
| 15.4.5         | RECIRCULATION FLOW CONTROL FAILURE WITH<br>INCREASING FLOW         | 15.4-14     |
| 15.4.6         | CHEMICAL AND VOLUME CONTROL SYSTEM MALFUNCTIONS                    | 15.4-19     |
| 15.4.7         | MISPLACED BUNDLE ACCIDENT  | 15.4-19     |
| 15.4.8         | SPECTRUM OF ROD EJECTION ASSEMBLIES                                | 15.4-22     |
| 15.4.9         | CONTROL ROD DROP ACCIDENT (CRDA)                                   | 15.4-23     |
| 15.4.10        | REFERENCES FOR SECTION 15.4  | 15.4-31     |

# MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>   | <u>Page</u> |
|----------------|--|-------------|
| 15.5           | <u>INCREASE IN REACTOR COOLANT INVENTORY</u>   | 15.5-1      |
| 15.5.1         | INADVERTENT HPCS STARTUP   | 15.5-1      |
| 15.5.2         | CHEMICAL VOLUME CONTROL SYSTEM MALFUNCTION<br>(OR OPERATOR ERROR)  | 15.5-4      |
| 15.5.3         | BWR TRANSIENTS WHICH INCREASE REACTOR COOLANT<br>INVENTORY   | 15.5-4      |
| 15.6           | <u>DECREASE IN REACTOR COOLANT INVENTORY</u>   | 15.6-1      |
| 15.6.1         | INADVERTENT SAFETY/RELIEF VALVE OPENING  | 15.6-1      |
| 15.6.2         | INSTRUMENT LINE PIPE BREAK   | 15.6-1      |
| 15.6.3         | STEAM GENERATOR TUBE FAILURE   | 15.6-8      |
| 15.6.4         | STEAM SYSTEM PIPING BREAK OUTSIDE CONTAINMENT  | 15.6-8      |
| 15.6.5         | LOSS-OF-COOLANT ACCIDENTS (RESULTING FROM<br>SPECTRUM OF POSTULATED PIPING BREAKS WITHIN<br>THE REACTOR COOLANT PRESSURE BOUNDARY) -<br>INSIDE CONTAINMENT | 15.6-16     |
| 15.6.6         | FEEDWATER LINE BREAK - OUTSIDE CONTAINMENT   | 15.6-38     |
| 15.6.7         | REFERENCES FOR SECTION 15.6  | 15.6-43a    |
| 15.7           | <u>RADIOACTIVE RELEASE FROM SUBSYSTEMS AND<br/>COMPONENTS</u>  | 15.7-1      |
| 15.7.1         | RADIOACTIVE GAS WASTE SYSTEM LEAK OR FAILURE   | 15.7-1      |
| 15.7.2         | RADIOACTIVE LIQUID WASTE SYSTEM FAILURES<br>(RELEASE TO ATMOSPHERE)  | 15.7-15     |
| 15.7.3         | POSTULATED RADIOACTIVE RELEASES DUE TO<br>LIQUID-CONTAINING TANK FAILURES  | 15.7-17     |
| 15.7.4         | FUEL HANDLING ACCIDENT OUTSIDE CONTAINMENT   | 15.7-21     |
| 15.7.5         | SPENT FUEL CASK DROP ACCIDENTS   | 15.7-30     |
| 15.7.6         | FUEL HANDLING ACCIDENT INSIDE CONTAINMENT  | 15.7-31     |

MASTER TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Title</u>  | <u>Page</u>     |
|----------------|---|-----------------|
| 15.7.7         | REFERENCES FOR SECTION 15.7                             | 15.7-37         |
| 15.8           | <u>OTHER EVENTS</u>                                     | 15.8-1          |
| 15.8.1         | ANTICIPATED TRANSIENTS WITHOUT SCRAM (ATWS)             | 15.8-1          |
| 15.8.2         | STATION BLACKOUT (SBO)                                  | 15.8-2          |
| APPENDIX 15A   | <u>PLANT NUCLEAR SAFETY OPERATIONAL ANALYSIS (NSOA)</u> | APP. 15A<br>TAB |
| APPENDIX 15B   | <u>RELOAD SAFETY ANALYSIS</u>                           | APP. 15B<br>TAB |
| APPENDIX 15C   | <u>ANTICIPATED TRANSIENTS WITHOUT SCRAM (ATWS)</u>      | APP. 15C<br>TAB |
| APPENDIX 15D   | <u>PARTIAL FEEDWATER HEATING OPERATION ANALYSIS</u>     | APP. 15D<br>TAB |
| APPENDIX 15E   | <u>PNPP MAXIMUM EXTENDED OPERATING DOMAIN ANALYSIS</u>  | APP. 15E<br>TAB |
| APPENDIX 15F   | <u>PNPP SINGLE LOOP OPERATION ANALYSIS</u>              | APP. 15F<br>TAB |
| APPENDIX 15G   | <u>CONTROL SYSTEM INTERACTIONS</u>                      | APP. 15G<br>TAB |
| APPENDIX 15H   | <u>STATION BLACKOUT (SBO)</u>                           | APP. 15H<br>TAB |
| 16.0           | <u>TECHNICAL SPECIFICATIONS</u>                         | 16.0-1          |
| 17.0           | <u>QUALITY ASSURANCE</u>                                | 17.0-1          |
| 17.1           | (DELETED)   |                 |
| 17.2           | <u>QUALITY ASSURANCE DURING THE OPERATIONS PHASE</u>    | 17.2-1          |