MASTER TABLE OF CONTENTS

Section	<u>Title</u>	<u>Page</u>
1.0	INTRODUCTION AND GENERAL DESCRIPTION OF PLANT	1.0-1
1.1	INTRODUCTION	1.1-1
1.2	GENERAL PLANT DESCRIPTION	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	COMPARISON TABLES	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	IDENTIFICATION OF AGENTS AND CONTRACTORS	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	REQUIREMENTS FOR FURTHER TECHNICAL INFORMATION	1.5-1
1.5.1	CURRENT DEVELOPMENT PROGRAMS	1.5-1
1.6	REFERENCE MATERIALS	1.6-1
1.7	DRAWINGS AND OTHER DETAILED INFORMATION	1.7-1

Section	<u>Title</u>	Page
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	NRC REGULATORY GUIDE ASSESSMENT	1.8-1
1.9	STANDARD DESIGNS	1.9-1
1.10	EVALUATION OF UNIT 1 OPERATIONS RESULTING FROM UNIT 2 CONSTRUCTION ACTIVITIES	1.10-1
APPENDIX 1A	NUREG-0737 "TMI ACTION PLAN REQUIREMENTS FOR APPLICANTS FOR NEW OPERATING LICENSES"	APP. 1A TAB
APPENDIX 1B	PNPP LICENSE COMMITMENTS	APP. 1B TAB
2.0	SITE CHARACTERISTICS	2.0-1
2.1	GEOGRAPHY AND DEMOGRAPHY	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	NEARBY INDUSTRIAL, TRANSPORTATION AND MILITARY FACILITIES	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	METEOROLOGY	2.3-1

Section	<u>Title</u>	Page
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	HYDROLOGIC ENGINEERING	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

<u>Section</u>	<u>Title</u>	Page
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	GEOLOGY, SEISMOLOGY AND GEOTECHNICAL ENGINEERING	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 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	ANNUAL JOINT FREQUENCY DISTRIBUTIONS FOR CLEVELAND AND ERIE	APP. 2A
APPENDIX 2B	MONTHLY AND ANNUAL JOINT FREQUENCY DISTRIBUTIONS FOR PNPP, 10-M WINDS	APP. 2E
APPENDIX 2C	MONTHLY AND ANNUAL JOINT FREQUENCY DISTRIBUTIONS FOR PNPP, 60-M WINDS	APP. 20
APPENDIX 2D	BEDROCK DEFORMATION IN THE COOLING WATER TUNNEL	APP. 20
APPENDIX 2E	SOIL AND ROCK BORINGS	APP. 2E TAB
3.0	DESIGN OF STRUCTURES, COMPONENTS, EQUIPMENT AND SYSTEMS	3.1-1
3.1	CONFORMANCE WITH NRC GENERAL DESIGN CRITERIA	3.1-1

Section	<u>Title</u>	<u>Page</u>
3.1.1	SUMMARY DESCRIPTION	3.1-1
3.1.2	CRITERION CONFORMANCE	3.1-2
3.2	CLASSIFICATION OF STRUCTURES, COMPONENTS AND SYSTEMS	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 CODES	3.2-10
3.3	WIND AND TORNADO LOADS	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	WATER LEVEL (FLOOD) DESIGN	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	MISSILE PROTECTION	3.5-1
3.5.1	MISSILE SELECTION AND DESCRIPTION	3.5-1
3.5.2	STRUCTURES, SYSTEMS AND COMPONENTS TO BE 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

Section	<u>Title</u>	<u>Page</u>
3.6	PROTECTION AGAINST DYNAMIC EFFECTS ASSOCIATED WITH THE POSTULATED RUPTURE OF PIPING	3.6-1
3.6.1	POSTULATED PIPING FAILURES IN FLUID SYSTEMS	3.6-1
3.6.2	DETERMINATION OF BREAK LOCATIONS AND DYNAMIC EFFECTS ASSOCIATED WITH THE POSTULATED RUPTURE OF PIPING	3.6-9
3.6.3	REFERENCES FOR SECTION 3.6	3.6-83
3.7	SEISMIC DESIGN	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	DESIGN OF CATEGORY I STRUCTURES	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	MECHANICAL SYSTEMS AND COMPONENTS	3.9-1
3.9.1	SPECIAL TOPICS FOR MECHANICAL COMPONENTS	3.9-1
3.9.2	DYNAMIC TESTING AND ANALYSIS	3.9-50

Section	<u>Title</u>	<u>Page</u>
3.9.3	ASME CODE CLASS 1, 2, AND 3 COMPONENTS, 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	SEISMIC AND DYNAMIC QUALIFICATION OF MECHANICAL AND ELECTRICAL EQUIPMENT	3.10-1
3.10.1	SEISMIC AND DYNAMIC QUALIFICATION CRITERIA	3.10-3
3.10.2	METHODS AND PROCEDURES FOR SEISMIC AND DYNAMIC QUALIFICATION OF MECHANICAL AND ELECTRICAL EQUIPMENT	3.10-9
3.10.3	METHODS AND PROCEDURES FOR SEISMIC AND DYNAMIC QUALIFICATION OF SUPPORTS OF 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	ENVIRONMENTAL QUALIFICATION OF MECHANICAL AND ELECTRICAL EQUIPMENT	3.11-1
3.11.1	EQUIPMENT IDENTIFICATION AND ENVIRONMENTAL CONDITIONS	3.11-1
3.11.2	ENVIRONMENTAL QUALIFICATION PROGRAM 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

Section	<u>Title</u>	<u>Page</u>
APPENDIX 3A	HYDRODYNAMIC LOADS FOR PNPP	APP. 3A TAB
APPENDIX 3B	CONTAINMENT LOADS	APP. 3B TAB
4.0	REACTOR	4.0-1
4.1	SUMMARY DESCRIPTION	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	FUEL SYSTEM DESIGN	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	NUCLEAR DESIGN	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

Section	<u>Title</u>	Page
4.4	THERMAL AND HYDRAULIC DESIGN	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	REACTOR MATERIALS	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	FUNCTIONAL DESIGN OF REACTIVITY CONTROL SYSTEMS	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	REACTOR COOLANT SYSTEM AND CONNECTED SYSTEMS	5.1-1
5.1	SUMMARY DESCRIPTION	5.1-1

Section	<u>Title</u>	Page
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	INTEGRITY OF REACTOR COOLANT PRESSURE BOUNDARY	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 REACTOR COOLANT PRESSURE BOUNDARY	5.2-43
5.2.5	DETECTION OF LEAKAGE THROUGH REACTOR COOLANT PRESSURE BOUNDARY	5.2 - 53
5.2.6	REFERENCES FOR SECTION 5.2	5.2-79
5.3	REACTOR VESSEL	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	COMPONENT AND SUBSYSTEM DESIGN	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

Section	<u>Title</u>	Page
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	ENGINEERED SAFETY FEATURES	6.1-1
6.1	ENGINEERED SAFETY FEATURE MATERIALS	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	CONTAINMENT SYSTEMS	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

<u>Section</u>	<u>Title</u>	Page
6.2.9	REFERENCES FOR SECTION 6.2	6.2-150
6.3	EMERGENCY CORE COOLING SYSTEM	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	HABITABILITY SYSTEMS	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	FISSION PRODUCT REMOVAL AND CONTROL SYSTEMS	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 SYSTEM	6.5-24
6.5.5	REFERENCES FOR SECTION 6.5	6.5-24
6.6	INSERVICE INSPECTION OF CLASS 2 AND 3 COMPONENTS	6.6-1
6.6.1	COMPONENTS SUBJECT TO EXAMINATION	6.6-1

Section	<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 AGAINST POSTULATED PIPING FAILURES	6.6-3
6.7	MAIN STEAM LINE ISOLATION VALVE LEAKAGE CONTROL SYSTEM	6.7-1
6.8	SAFETY-RELATED INSTRUMENT AIR SYSTEM	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	FEEDWATER LEAKAGE CONTROL SYSTEM	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	INSTRUMENTATION AND CONTROLS SYSTEMS	7.1-1
7.1	INTRODUCTION	7.1-1

Section	<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	REACTOR TRIP SYSTEM - REACTOR PROTECTION SYSTEM (RPS)	7.2-1
7.2.1	DESCRIPTION	7.2-1
7.2.2	ANALYSIS	7.2-22
7.3	ENGINEERED SAFETY FEATURE SYSTEMS	7.3-1
7.3.1	DESCRIPTION	7.3-1
7.3.2	ANALYSIS	7.3-68
7.4	SYSTEMS REQUIRED FOR SAFE SHUTDOWN	7.4-1
7.4.1	DESCRIPTION	7.4-1
7.4.2	ANALYSIS	7.4-27
7.5	SAFETY-RELATED DISPLAY INSTRUMENTATION	7.5-1
7.5.1	DESCRIPTION	7.5-1
7.5.2	ANALYSIS	7.5-11
7.6	ALL OTHER INSTRUMENTATION SYSTEMS REQUIRED FOR SAFETY	7.6-1
7.6.1	DESCRIPTION	7.6-1
7.6.2	ANALYSIS	7.6-48
7.7	CONTROL SYSTEMS NOT REQUIRED FOR SAFETY	7.7-1
7.7.1	DESCRIPTION	7.7-1
7.7.2	ANALYSIS	7.7-50
8.0	ELECTRIC POWER	8.1-1

Section	<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	OFFSITE POWER SYSTEM	8.2-1
8.2.1	DESCRIPTION	8.2-1
8.2.2	ANALYSIS	8.2-6
8.3	ONSITE POWER SYSTEMS	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	AUXILIARY SYSTEMS	9.1-1
9.1	FUEL STORAGE AND HANDLING	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 FUEL AND OTHER CRITICAL PLANT SYSTEMS/COMPONENTS	9.1-82
9.1.6	REFERENCES FOR SECTION 9.1	9.1-83
9.2	WATER SYSTEMS	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

Section	<u>Title</u>	Page
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	PROCESS AUXILIARIES	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	AIR CONDITIONING, HEATING, COOLING AND VENTILATING SYSTEMS	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

Section	<u>Title</u>	<u>Pa</u>	.ge
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 SYSTEM	9.	4-127
9.4.12	MISCELLANEOUS NONSAFETY HVAC SYSTEMS	9.	4-142
9.5	OTHER AUXILIARY SYSTEMS	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 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 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	FIRE PROTECTION EVALUATION REPORT	AF TA	P. 9A AB
10.0	STEAM AND POWER CONVERSION SYSTEM	10	1-1
10.1	SUMMARY DESCRIPTION	10	1-1
10.2	TURBINE GENERATOR	10	2-1
	xvii	Revision October,	

Section	<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	MAIN STEAM SUPPLY SYSTEM	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	OTHER FEATURES OF STEAM AND POWER CONVERSION SYSTEM	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

Section	<u>Title</u>	Page
10.4.10	REFERENCES FOR SECTION 10.4	10.4-46
11.0	RADIOACTIVE WASTE MANAGEMENT	11.1-1
11.1	SOURCE TERMS	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 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 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	LIQUID WASTE MANAGEMENT SYSTEMS	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	GASEOUS WASTE MANAGEMENT SYSTEMS	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

Section	<u>Title</u>	Page
11.4	SOLID RADIOACTIVE WASTE MANAGEMENT SYSTEM	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	PROCESS AND EFFLUENT RADIOLOGICAL MONITORING AND SAMPLING SYSTEMS	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	RADIATION PROTECTION	12.1-1
12.1	ENSURING THAT OCCUPATIONAL RADIATION EXPOSURES ARE AS LOW AS REASONABLY ACHIEVABLE (ALARA)	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	RADIATION SOURCES	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	RADIATION PROTECTION DESIGN FEATURES	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

Section	<u>Title</u>	<u>Page</u>
12.3.4	AREA RADIATION AND AIRBORNE RADIOACTIVITY MONITORING INSTRUMENTATION	12.3-24
12.3.5	REFERENCES FOR SECTION 12.3	12.3-68
12.4	DOSE ASSESSMENT	12.4-1
12.4.1	ESTIMATES OF PERSONNEL OCCUPANCY 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 FACILITY AT THE BOUNDARY OF THE RESTRICTED AREA	12.4-5
12.4.5	REFERENCES FOR SECTION 12.4	12.4-10
12.5	RADIATION PROTECTION PROGRAM	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	DESIGN REVIEW OF PLANT SHIELDING FOR SPACES/ SYSTEMS WHICH MAY BE USED IN POSTACCIDENT OPERATIONS OUTSIDE CONTAINMENT	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 SUMMARY	12.6-11

Section	<u>Title</u>	Page
12.6.8	REFERENCES FOR SECTION 12.6	12.6-11
13.0	CONDUCT OF OPERATIONS	13.1-1
13.1	ORGANIZATIONAL STRUCTURE OF APPLICANT	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	TRAINING PROGRAM	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	EMERGENCY PLANNING	13.3-1
13.3.1	REFERENCE FOR SECTION 13.3	13.3-2
13.4	REVIEW AND AUDIT	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	PLANT PROCEDURES	13.5-1
13.5.1	PROCEDURES AND INSTRUCTIONS	13.5-2
13.5.2	OPERATING AND MAINTENANCE INSTRUCTIONS	13.5-5

Section	<u>Title</u>	Page
13.6	INDUSTRIAL SECURITY	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	INITIAL TEST PROGRAM	14.1-1
14.1	SPECIFIC INFORMATION TO BE INCLUDED IN PRELIMINARY SAFETY ANALYSIS REPORTS	14.1-1
14.2	PERRY NUCLEAR POWER PLANT TEST PROGRAM	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 GUIDES	14.2-30
14.2.8	UTILIZATION OF REACTOR OPERATING AND TESTING EXPERIENCES IN THE DEVELOPMENT OF THE TEST PROGRAM	14.2-30
14.2.9	TRIAL USE OF PLANT OPERATING AND EMERGENCY 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	ACCIDENT ANALYSIS	15.0-1
15.0	GENERAL	15.0-1

Section	<u>Title</u>	Page
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) RELATIONSHIP	15.0-17a
15.0.5	EXTENDED OPERATING DOMAINS AND MODES 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	DECREASE IN REACTOR COOLANT TEMPERATURE	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 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	INCREASE IN REACTOR PRESSURE	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

Section	<u>Title</u>	Page
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	DECREASE IN REACTOR COOLANT SYSTEM FLOW RATE	15.3-1
15.3.1	RECIRCULATION PUMP TRIP	15.3-1
15.3.2	RECIRCULATION FLOW CONTROL FAILURE - 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	REACTIVITY AND POWER DISTRIBUTION ANOMALIES	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 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 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

Section	<u>Title</u>	Page
15.5	INCREASE IN REACTOR COOLANT INVENTORY	15.5-1
15.5.1	INADVERTENT HPCS STARTUP	15.5-1
15.5.2	CHEMICAL VOLUME CONTROL SYSTEM MALFUNCTION (OR OPERATOR ERROR)	15.5-4
15.5.3	BWR TRANSIENTS WHICH INCREASE REACTOR COOLANT INVENTORY	15.5-4
15.6	DECREASE IN REACTOR COOLANT INVENTORY	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 SPECTRUM OF POSTULATED PIPING BREAKS WITHIN THE REACTOR COOLANT PRESSURE BOUNDARY) - 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	RADIOACTIVE RELEASE FROM SUBSYSTEMS AND COMPONENTS	15.7-1
15.7.1	RADIOACTIVE GAS WASTE SYSTEM LEAK OR FAILURE	15.7-1
15.7.2	RADIOACTIVE LIQUID WASTE SYSTEM FAILURES (RELEASE TO ATMOSPHERE)	15.7-15
15.7.3	POSTULATED RADIOACTIVE RELEASES DUE TO 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

Section	<u>Title</u>	Page	
15.7.7	REFERENCES FOR SECTION 15.7	15.7-3	37
15.8	OTHER EVENTS	15.8-1	1
15.8.1	ANTICIPATED TRANSIENTS WITHOUT SCRAM (ATWS)	15.8-1	l
15.8.2	STATION BLACKOUT (SBO)	15.8-2	2
APPENDIX 15	PLANT NUCLEAR SAFETY OPERATIONAL ANALYSIS (NSOA)	APP. 1	L5A
APPENDIX 15	B RELOAD SAFETY ANALYSIS	APP. 1	15B
APPENDIX 15	C ANTICIPATED TRANSIENTS WITHOUT SCRAM (ATWS)	APP. I	15C
APPENDIX 15	D PARTIAL FEEDWATER HEATING OPERATION ANALYSIS	APP. 1	15D
APPENDIX 15	E PNPP MAXIMUM EXTENDED OPERATING DOMAIN ANALYSIS	APP. 1	15E
APPENDIX 15	F PNPP SINGLE LOOP OPERATION ANALYSIS	APP. TAB	15F
APPENDIX 15	G CONTROL SYSTEM INTERACTIONS	APP. TAB	15G
APPENDIX 15	H STATION BLACKOUT (SBO)	APP. 1	15н
16.0	TECHNICAL SPECIFICATIONS	16.0-3	1
17.0	QUALITY ASSURANCE	17.0-3	1
17.1	(DELETED)		,
17.2	QUALITY ASSURANCE DURING THE OPERATIONS PHASE	17.2-3	1