

STPEGS UFSAR

TABLE OF CONTENTS

CHAPTER 11

RADIOACTIVE WASTE MANAGEMENT

<u>Section</u>	<u>Title</u>	<u>Page</u>
11.1	SOURCE TERMS	11.1-1
11.1.1	Design Basis Radioactivity in Systems and Components	11.1-1
11.1.2	Radioactivity Concentrations in the Fluid Systems, Realistic Basis	11.1-4
11.1.3	Tritium Production and Release to the Reactor Coolant	11.1-4
11.1.4	Activity in Radwaste Systems	11.1-5
11.1.5	Leakage Sources	11.1-5
11.1.6	The Impact of Extended Burnup Fuel on Source Terms	11.1-5
11.1.7	The Impact of Operating at a Reduced Feedwater Temperature on Source Terms	11.1-5
11.1.8	The Impact of Replacement Steam Generators on Source Terms	11.1-6
11.2	LIQUID WASTE MANAGEMENT SYSTEMS	11.2-1
11.2.1	Design Bases	11.2-1
11.2.2	Systems Descriptions	11.2-1
11.2.3	Radioactive Releases	11.2-9
11.2.4	Dilution Factors	11.2-11
11.2.5	Estimated Doses	11.2-11
11.3	GASEOUS WASTE MANAGEMENT SYSTEM	11.3-1
11.3.1	Design Bases	11.3-1
11.3.2	System Description	11.3-3
11.3.3	Radioactive Releases	11.3-10
11.4	SOLID WASTE MANAGEMENT SYSTEM	11.4-1
11.4.1	Design Bases	11.4-1
11.4.2	System Description	11.4-3
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	11.5-4
11.5.3	Effluent Monitoring and Sampling	11.5-15

STPEGS UFSAR

TABLE OF CONTENTS (Continued)

CHAPTER 11

<u>Section</u>	<u>Title</u>	<u>Page</u>
11.5.4	Process Monitoring and Sampling	11.5-16
APPENDIX 11.A	OFFSITE RADIOLOGICAL IMPACT DUE TO EFFLUENTS RESULTING FROM OPERATION OF THE SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION	11.A-1
11.A.1	INTRODUCTION	11.A-1
11.A.2	Summary and Conclusions	11.A-1
11.A.2.1	Maximum Individual Dose	11.A-1
11.A.2.2	Population Dose	11.A-1
11.A.2.3	Conclusions	11.A-2
11.A.3	Radiological Impact on Man	11.A-2
11.A.3.1	Dose Pathways to Man	11.A-2
11.A.3.2	Radioactivity in the Environment	11.A-2
11.A.3.3	Radiation Dose from Gaseous Effluents	11.A-3
11.A.3.4	Radiation Dose from Liquid Effluents	11.A-4
11.A.4	Dose Totals and Comparison with Federal Regulations and Natural Background	11.A-6
11.A.4.1	Individual Doses	11.A-6
11.A.4.2	Population Doses	11.A-6
11.A.5	Comparison of Site Boundary Concentrations (Design Basis Releases) to 10CFR20 Appendix B	11.A-6
11.A.5.1	Liquid Effluent Concentrations	11.A-6
11.A.5.2	Gaseous Effluent Concentrations	11.A-7

STPEGS UFSAR

LIST OF TABLES

CHAPTER 11

<u>Table</u>	<u>Title</u>	<u>Page</u>
11.1-1	Parameters Used in the Calculation of Design Basis Fission and Corrosion Product Concentrations	11.1-8
11.1-2	Reactor Coolant Design Equilibrium Fission and Corrosion Product Concentrations	11.1-11
11.1-3	Volume Control Tank Vapor Activity	11.1-12
11.1-4	Parameters Used in the Calculation of Design Basis Secondary Coolant Concentrations	11.1-13
11.1-5	Secondary Coolant Design Basis Equilibrium Fission and Corrosion Product Concentrations	11.1-15
11.1-6	Parameters Used to Describe the Reactor System - Realistic Basis	11.1-18
11.1-7	Specific Activities in Principal Fluid Streams - Realistic Basis	11.1-20
11.1-8	Total Tritium Sources	11.1-23
11.2-3	Equipment Design Descriptions	11.2-12
11.2-4.1	Radionuclide Inventory of LWPS Tanks/Units (Realistic Basis)	11.2-31
11.2-4.2	Radionuclide Inventory of LWPS Tanks/Units (Design Basis)	11.2-32
11.2-5	Tanks Potentially Containing Radioactive Liquid	11.2-33
11.2-5A	LWPS Tank Monitoring Provisions	11.2-34
11.2-7.1	Assumptions Used For Estimating Activity Releases	11.2-35
11.2-7.2	Expected Site Radionuclide Releases and Concentrations	11.2-38
11.3-1.1	Expected Annual Activity Released Per Unit	11.3-12
11.3-2	Assumptions Used for Estimating Activity Releases for Tables 11.3-1.1 and 11.3-1.2	11.3-13
11.3-3	Gaseous Waste Processing System Component Design Parameters	11.3-15

STPEGS UFSAR

LIST OF TABLES (Continued)

CHAPTER 11

<u>Section</u>	<u>Title</u>	<u>Page</u>
11.3-5.1	Estimate of Maximum Component Activity - Design Basis	11.3-18
11.3-5.2	Estimate of Maximum Component Activity - Realistic Basis	11.3-19
11.3-5.3	Maximum and Realistic GWPS Inlet Activity	11.3-20
11.3-6	Gaseous Waste Processing System Instrumentation	11.3-21
11.4-1	Solid Waste Processing System Fabrication Codes	11.4-11
11.4-4	Estimated Maximum Annual Quantities of Solid Radwaste for One Unit	11.4-12
11.4-5	Estimated Maximum Annual Activities of the Inputs to the Solid Waste Processing System	11.4-13
11.4-6	Estimated Expected Annual Activities of the Inputs to the Solid Waste Processing System	11.4-15
11.4-7	Estimated Maximum Annual Activities in Shipped Radwaste	11.4-17
11.4-8	Estimated Expected Annual Activities in Shipped Radwaste	11.4-19
11.5-1	Process and Effluent Radiation Monitoring System	11.5-17
11.5-2	Radiation Monitoring System Failure Modes and Effects Analysis	11.5-22
11.A-1	Calculated Concentrations of Radioactive Materials in Environmental Media from Liquid Effluents of the South Texas Project Electric Generating Station	11.A-9
11.A-2	Maximum Site Boundary Concentration Compared to 10CFR20 Limits	11.A-10
11.A-3	Summary of Calculated Gaseous Pathway Doses South Texas Project Electric Generating Station	11.A-11
11.A-4	Summary of Calculated Liquids Pathway Doses South Texas Project Electric Generating Station	11.A-12

STPEGS UFSAR

LIST OF TABLES (Continued)

CHAPTER 11

<u>Section</u>	<u>Title</u>	<u>Page</u>
11.A-5	Predicted Doses to the Population Within 50 Miles of the South Texas Project Electric Generating Station	11.A-13
11.A-6	Appendix I Conformance Summary Table South Texas Project Electric Generating Station	11.A-14
11.A-7	Comparison of Site Boundary to 10CFR20 Appendix B Maximum Permissible Limits (Expected Concentrations)	11.A-16

STPEGS UFSAR

LIST OF FIGURES

CHAPTER 11

<u>Figure Number</u>	<u>Title</u>	<u>Reference Number</u>
11.2-1	P&ID Liquid Waste Processing System	5R30-9-F-05022#1 5R30-9-F-05022#2
11.2-2	P&ID Liquid Waste Processing System	7R30-9-F-05023#1 7R30-9-F-05023#2
11.2-3	P&ID Liquid Waste Processing System	7R30-9-F-05024#1 7R30-9-F-05024#2
11.2-4	P&ID Liquid Waste Processing System	7R30-9-F-90000#1 7R30-9-F-90000#2
11.2-5	P&ID Liquid Waste Processing System	7R30-9-F-90001#1 7R30-9-F-90001#2
11.2-6	P&ID Liquid Waste Processing System) Waste Evaporator Package	7R30-9-F-05026#1 7R30-9-F-05026#2
11.2-7	P&ID Liquid Waste Processing System Waste Evaporator Package	7R30-9-F-90020#1 7R30-9-F-90020#2
11.2-8	P&ID Liquid Waste Processing System - Pump Seal Water System	7R30-9-F-90017#1 7R30-9-F-90017#2
11.2-9	P&ID Liquid Waste Processing System	7R30-9-F-90018#1 7R30-9-F-90018#2
11.2-10	P&ID Liquid Waste Processing System	7R30-9-F-90021#1 7R30-9-F-90021#2
11.2-11	P&ID Liquid Waste Processing System	7R30-9-F-90022#1 7R30-9-F-90022#2
11.2-12	Flow Diagram Liquid Waste Processing System	7R30-9-F-90023 (Flow)
11.3-1	Gaseous and Airborne Waste Processing Systems	

STPEGS UFSAR

LIST OF FIGURES (Continued)

CHAPTER 11

<u>Figure Number</u>	<u>Title</u>	<u>Reference Number</u>
11.3-2	P&ID Gaseous Waste Processing	7R31-9-F-05043#1 7R31-9-F-05043#2 7R31-9-F-05055#1 7R31-9-F-05055#2
11.3-3	P&ID RCS Vacuum Degassing System	5R34-9-F-05046#1 5R34-9-F-05046#2
11.4-1	P&ID Solid Waste Processing System	6R32-9-F-05048#1 6R32-9-F-05048#2
11.4-2	P&ID Solid Waste Processing System	6R32-9-F-05059#1 6R32-9-F-05059#2
11.4-3	Process Flow Diagram, Solid Waste Processing System	
11.5-1	Block Diagram Radiation Monitoring System	
11.A-1	Exposure Pathways to Man	