

**FORT CALHOUN STATION UNIT 1
LICENSE RENEWAL APPLICATION
TABLE OF CONTENTS**

PREFACE	1
1.0 ADMINISTRATIVE INFORMATION	1
1.1 Purpose And General Information	1
1.2 Name Of Applicant	1
1.3 Address Of Applicant	1
1.4 Description Of Business Or Occupation Of Applicant	1
1.5 Organization And Management Of Applicant	2
1.6 Class And Period Of License Sought	4
1.7 Alteration Schedule	4
1.8 Regulatory Agencies Having Jurisdiction And Appropriate News Publications	4
1.9 Conforming Changes To The Standard Indemnity Agreement	5
1.10 Restricted Data Agreement	5
1.11 Description Of Fort Calhoun Station	5
2.0 SCOPING AND SCREENING METHODOLOGY FOR IDENTIFYING STRUCTURES AND COMPONENTS SUBJECT TO AGING MANAGEMENT REVIEW, AND IMPLEMENTATION RESULTS	1
2.1 Scoping And Screening Methodology	1
2.2 Plant Level Scoping Results	17
2.4 Scoping And Screening Results: Structures	75
2.5 Scoping And Screening Results: Electrical	98
2.6 References	114
3.0 AGING MANAGEMENT REVIEW	1
3.1 Aging Management Of Reactor Coolant Systems	4
3.2 Aging Management Of Engineered Safety Features Systems	30
3.3 Aging Management Of Auxiliary Systems	39
3.4 Aging Management Of Steam And Power Conversion Systems	74
3.5 Aging Management Of Containment, Structures And Component Supports	86
3.6 Aging Management Of Electrical And Instrumentation And Controls	116
4.0 TIME-LIMITED AGING ANALYSES	1
4.1 Identification Of Time Limited Aging Analyses	2
4.2 Reactor Vessel Neutron Embrittlement	5
4.3 Metal Fatigue	8
4.4 Environmental Qualification (EQ)	18
4.5 Concrete Containment Tendon Pre-stress	21
4.6 Containment Liner Plate And Penetration Sleeve Fatigue	22
4.7 Other TLAAs	23
4.8 References	26
APPENDIX A – UPDATED SAFETY ANALYSIS REPORT (USAR) SUPPLEMENT	
A.1 Introduction	1
A.2 Programs And Activities For Managing The Effects Of Aging	1
A.2.1 Alloy 600 Program	1

**FORT CALHOUN STATION UNIT 1
LICENSE RENEWAL APPLICATION
TABLE OF CONTENTS**

A.2.2	Bolting Integrity Program	1
A.2.3	Boric Acid Corrosion Prevention Program	2
A.2.4	Buried Surfaces External Corrosion Program	2
A.2.5	Chemistry Program	2
A.2.6	Containment Inservice Inspection Program	2
A.2.7	Containment Leak Rate Program	3
A.2.8	Cooling Water Corrosion Program	3
A.2.9	Diesel Fuel Monitoring And Storage Program	3
A.2.10	Fatigue Monitoring Program	4
A.2.11	Fire Protection Program	4
A.2.12	Flow Accelerated Corrosion Program	4
A.2.13	General Corrosion Of External Surfaces Program	4
A.2.14	Inservice Inspection Program	5
A.2.15	Non-EQ Cable Aging Management Program	5
A.2.16	One-time Inspection Program	5
A.2.17	Overhead Load Handling Systems Inspection Program	5
A.2.18	Periodic Surveillance And Preventive Maintenance Program	6
A.2.19	Reactor Vessel Integrity Program	6
A.2.20	Reactor Vessel Internals Inspection Program	6
A.2.21	Selective Leaching Program	6
A.2.22	Steam Generator Program	6
A.2.23	Structures Monitoring Program	7
A.2.24	Thermal Aging Embrittlement Of Cast Austenitic Stainless Steel Program	7
A.3	Evaluation Of Time-limited Aging Analyses	7
A.3.1	Reactor Vessel Neutron Embrittlement	7
A.3.2	Metal Fatigue	9
A.3.3	Environmental Qualification Of Electrical Equipment	9
A.3.4	Concrete Containment Tendon Pre-stress	9
A.3.5	Containment Liner Plate And Penetration Sleeve Fatigue	10
A.3.6	Plant-specific Time-limited Aging Analyses	10

APPENDIX B – AGING MANAGEMENT ACTIVITIES

B.1	Existing Aging Management Activities	7
B.1.1	Chemistry Program	7
B.1.2	Containment Inservice Inspection Program	8
B.1.3	Containment Leak Rate Program	9
B.1.4	Flow Accelerated Corrosion Program	10
B.1.5	Inservice Inspection Program	11
B.1.6	Reactor Vessel Integrity Program	12
B.1.7	Steam Generator Program	13
B.2	Enhanced Aging Management Activities	14
B.2.1	Bolting Integrity Program	14
B.2.2	Boric Acid Corrosion Prevention Program	15
B.2.3	Cooling Water Corrosion Program	16

**FORT CALHOUN STATION UNIT 1
LICENSE RENEWAL APPLICATION
TABLE OF CONTENTS**

B.2.4	Diesel Fuel Monitoring And Storage Program	18
B.2.5	Fatigue Monitoring Program	19
B.2.6	Fire Protection Program	21
B.2.7	Overhead Load Handling Systems Inspection Program	22
B.2.8	Periodic Surveillance And Preventive Maintenance (PM) Program	23
B.2.9	Reactor Vessel Internals Inspection Program	27
B.2.10	Structures Monitoring Program	30
B.2.11	Thermal Aging Embrittlement Of Cast Austenitic Stainless Steel	31
B.3	New Aging Management Activities	32
B.3.1	Alloy 600 Program	32
B.3.2	Buried Surfaces External Corrosion Program	34
B.3.3	General Corrosion Of External Surfaces Program	35
B.3.4	Non-EQ Cable Aging Management Program	38
B.3.5	One-time Inspection Program	41
B.3.6	Selective Leaching Program	42

APPENDIX C - (NOT USED)

APPENDIX D - TECHNICAL SPECIFICATION CHANGES

APPENDIX E - ENVIRONMENTAL INFORMATION

**FORT CALHOUN STATION UNIT 1
LICENSE RENEWAL APPLICATION
LIST OF TABLES**

Table P.1	List Of Acronyms, Symbols, Etc.	3
Table 2.2-1	Plant Level Scoping Results	17
Table 2.3.1.1-1	Reactor Vessel Internals	25
Table 2.3.1.2-1	Reactor Coolant	29
Table 2.3.1.3-1	Reactor Vessel	34
Table 2.3.2.1-1	Safety Injection And Containment Spray	37
	Review And Intended Functions	37
Table 2.3.2.2-1	Containment Penetrations, And System Interface	38
Table 2.3.3.1-1	Chemical And Volume Control System	40
Table 2.3.3.2-1	Spent Fuel Pool Cooling Component Types Subject To Aging Management Review And Intended Functions	42
Table 2.3.3.3-1	Emergency Diesel Generators Component Types Subject To Aging Management Review And Intended Functions	44
Table 2.3.3.4-1	Emergency Diesel Generator Lube Oil And Fuel Oil	46
Table 2.3.3.5-1	Auxiliary Boiler Fuel Oil And Fire Protection Fuel Oil	48
Table 2.3.3.6-1	Emergency Diesel Generator Jacket Water	49
Table 2.3.3.7-1	Starting Air	50
Table 2.3.3.8-1	Instrument Air	52
Table 2.3.3.9-1	Nitrogen Gas	53
Table 2.3.3.10-1	Containment Ventilation	54
Table 2.3.3.11-1	Auxiliary Building HVAC	56
Table 2.3.3.12-1	Control Room HVAC And Toxic Gas Monitoring	58
Table 2.3.3.13-1	Ventilating Air	59
Table 2.3.3.14-1	Fire Protection	61
Table 2.3.3.15-1	Raw Water	63
Table 2.3.3.16-1	Component Cooling	65
Table 2.3.3.17-1	Liquid Waste Disposal	67
Table 2.3.3.18-1	Gaseous Waste Disposal	68
Table 2.3.3.19-1	Primary Sampling	69
Table 2.3.3.20-1	Radiation Monitoring – Mechanical	70
Table 2.3.4.1-1	Feedwater	71
Table 2.3.4.2-1	Auxiliary Feedwater	73
Table 2.3.4.3-1	Main Steam And Turbine Steam Extraction	74
Table 2.4.1-1	Containment	77
Table 2.4.2.1-1	Auxiliary Building	80
Table 2.4.2.2-1	Turbine Building And Service Building	85
Table 2.4.2.3-1	Intake Structure	86
Table 2.4.2.4-1	Building Piles	90
Table 2.4.2.5-1	Fuel Handling Equipment And Heavy Load Cranes	91
Table 2.4.2.6-1	Component Supports	94
Table 2.4.2.7-1	Duct Banks	97
Table 2.5.1-1	Cables And Connectors	99
Table 2.5.2-1	Containment Electrical Penetrations	100
Table 2.5.20-1	Bus Bars	113
Table 3.1-1	Summary Of Aging Management Programs For Reactor Vessel, Internals, And Reactor Coolant System Evaluated	

**FORT CALHOUN STATION UNIT 1
LICENSE RENEWAL APPLICATION
LIST OF TABLES**

Table 3.2-1	In NUREG-1801 That Are Relied On For FCS License Renewal Summary Of Aging Management Programs For Engineered Safety Features Evaluated In NUREG-1801 That Are Relied On For FCS License Renewal	6 32
Table 3.2-2	FCS Engineered Safety Features Component Types Subject To Aging Management Review Not Evaluated In NUREG-1801	38
Table 3.3-1	Summary Of Aging Management Programs For Auxiliary Systems Evaluated In NUREG-1801 That Are Relied On For FCS License Renewal	44
Table 3.3-2	FCS Auxiliary Systems Component Types Subject To Aging Management Not Evaluated In NUREG-1801	57
Table 3.4-2	FCS Steam And Power Conversion Systems Component Types Subject To Aging Management Review Not Evaluated In NUREG-1801	84
Table 3.5-1	Summary Of Aging Management Programs For Structures And Component Supports Evaluated In NUREG-1801 That Are Relied On For FCS License Renewal	88
Table 3.5-2	Aging Management Programs For Containment, Structures And Components That Are Not Addressed In NUREG-1801	109
Table 4.1-1	Time-limited Aging Analyses Applicable To FCS	3
Table 4.3-1	FCS Reactor Coolant System Code Requirements	8
Figure 4.3.2-1	GSI-190 Evaluation Process	16