

CHAPTER 9— AUXILIARY SYSTEMS

LIST OF FIGURES

Figure 9.1.2-1—New Fuel and Spent Fuel Storage Rack Representative Layout	9.1-10
Figure 9.1.2-2—Typical New and Spent Fuel Storage Rack Cross-Sections	9.1-11
Figure 9.1.3-1—Fuel Pool Cooling System.....	9.1-26
Figure 9.1.3-2—Fuel Pool Purification System	9.1-27
Figure 9.1.4-1—Refueling Machine	9.1-46
Figure 9.1.4-2—Fuel Assemblies Hoisting Mechanism	9.1-47
Figure 9.1.4-3—Fuel Transfer Tube Facility, Reactor Building.....	9.1-48
Figure 9.1.4-4—Fuel Transfer Tube Facility, Fuel Building	9.1-49
Figure 9.1.4-5—New Fuel Elevator.....	9.1-50
Figure 9.1.4-6—Spent Fuel Machine	9.1-51
Figure 9.1.4-7—Spent Fuel Cask Transfer Facility.....	9.1-52
Figure 9.2.1-1—Essential Service Water System Piping & Instrumentation Diagram	9.2-11
Figure 9.2.2-1—Component Cooling Water System Trains 1 through 4	9.2-36
Figure 9.2.2-2—Component Cooling Water System Common Loop 1	9.2-38
Figure 9.2.2-3—Component Cooling Water System Common Loop 2	9.2-45
Figure 9.2.2-4—Component Cooling Water System Dedicated CCWS Trains	9.2-53
Figure 9.2.5-1—Ultimate Heat Sink Piping and Instrumentation Diagram.....	9.2-64
Figure 9.2.7-1—Seal Water Supply System	9.2-70
Figure 9.2.8-1—Safety Chilled Water System Diagram.....	9.2-80
Figure 9.3.2-1—Nuclear Sampling System.....	9.3-16
Figure 9.3.2-2—Severe Accident Sampling System.....	9.3-25
Figure 9.3.3-1—Nuclear Island Drain and Vent System.....	9.3-32
Figure 9.3.4-1—Chemical and Volume Control System	9.3-66
Figure 9.3.4-2—Coolant Purification System.....	9.3-75
Figure 9.3.4-3—Coolant Degasification System	9.3-80
Figure 9.3.4-4—Reactor Makeup and Inventory Control System	9.3-82

Figure 9.3.4-5—Coolant Supply and Storage System	9.3-84
Figure 9.3.4-6—Coolant Treatment System	9.3-87
Figure 9.4.1-1—Control Room Air Intake and Iodine Filtration Train Subsystems	9.4-12
Figure 9.4.1-2—Control Room Recirculation Air Handling Subsystem.....	9.4-13
Figure 9.4.1-3—Control Room Envelope Air Supply and Recirculation Subsystem	9.4-14
Figure 9.4.2-1—Fuel Building Ventilation System	9.4-24
Figure 9.4.3-1—Nuclear Auxiliary Building Supply Air Filtration and A/C Trains	9.4-33
Figure 9.4.3-2—Nuclear Auxiliary Building Air Supply and Exhaust Subsystem	9.4-34
Figure 9.4.3-3—Nuclear Auxiliary Building Exhaust Filtration Trains Subsystem	9.4-35
Figure 9.4.3-4—Nuclear Auxiliary Building Exhaust Iodine Filtration Train Subsystem	9.4-36
Figure 9.4.3-5—Nuclear Auxiliary Building Laboratory Iodine Exhaust Filtration Train.....	9.4-37
Figure 9.4.5-1—Safeguard Buildings Air Supply Sub-System.....	9.4-52
Figure 9.4.5-2—Safeguard Buildings Exhaust Air Sub-System.....	9.4-53
Figure 9.4.6-1—Safeguard Building Electrical Divisions 1 and 4 Air Intake	9.4-66
Figure 9.4.6-2—Safeguard Building Electrical Divisions 1 and 4 Air Supply and Exhaust.....	9.4-67
Figure 9.4.6-3—Safeguard Building Electrical Divisions 2 and 3 Air Intake	9.4-68
Figure 9.4.6-4—Safeguard Building Electrical Divisions 2 and 3 Air Supply and Exhaust.....	9.4-69
Figure 9.4.7-1—Containment Building Low Flow and Full Flow Purge Supply Subsystem	9.4-79
Figure 9.4.7-2—Containment Building Low Flow and Full Flow Purge Exhaust Subsystem	9.4-80
Figure 9.4.7-3—Containment Building Internal Filtration Subsystem	9.4-81
Figure 9.4.7-4—Containment Building Cooling Subsystem.....	9.4-82
Figure 9.4.7-5—Containment Building Service Compartments Cooling Subsystem	9.4-83
Figure 9.4.8-1—Radioactive Waste Building Ventilation System Air Supply	9.4-91
Figure 9.4.8-2—Radioactive Waste Building Ventilation System Exhaust Air	

Station	9.4-92
Figure 9.4.9-1—Emergency Power Generating Building Ventilation System	9.4-101
Figure 9.4.11-1—Essential Service Water Pump Building Ventilation System	9.4-113
Figure 9.4.12-1—Main Steam and Feedwater Valve Room Ventilation System	9.4-118
Figure 9.4.13-1—Typical Configuration of Smoke Confinement System.....	9.4-126
Figure 9.4.13-2—Smoke Confinement System Interconnecting Passageway.....	9.4-127
Figure 9.4.14-1—Access Building Ventilation System – Supply Air Subsystem	9.4-136
Figure 9.4.14-2—Access Building Ventilation System – Supply and Exhaust Air Subsystem.....	9.4-137
Figure 9.5.1-1—Fire Water Distribution System Inside Nuclear Island.....	9.5-41
Figure 9.5.1-2—Spray Deluge Systems Layout.....	9.5-54
Figure 9.5.1-3—Sprinkler Systems Layout	9.5-56
Figure 9.5.1-4—Gaseous Fire Extinguishing Systems Layout	9.5-57
Figure 9.5.2-1—Portable Wireless Communication Systems	9.5-67
Figure 9.5.2-2—Sound-Powered System	9.5-68
Figure 9.5.4-1—Emergency Diesel Generator Fuel Oil Storage and Transfer System	9.5-87
Figure 9.5.5-1—Emergency Diesel Generator Cooling Water System.....	9.5-97
Figure 9.5.6-1—Emergency Diesel Generator Starting Air System.....	9.5-107
Figure 9.5.7-1—Emergency Diesel Generator Lubricating Oil System.....	9.5-118
Figure 9.5.8-1—Emergency Diesel Generator Air Intake and Exhaust System	9.5-125
Figure 9.A-1—Fire Zone Layouts-Emergency Power Generating Buildings (UBP), +/-0 Feet.....	9.A-87
Figure 9.A-2—Fire Zone Layouts-Emergency Power Generating Buildings (UBP), +33 Feet.....	9.A-88
Figure 9.A-3—Fire Zone Layouts-Emergency Power Generating Buildings (UBP), +52 Feet.....	9.A-89
Figure 9.A-4—Fire Zone Layouts-Emergency Power Generating Buildings (UBP), Section-A-A	9.A-90
Figure 9.A-5—Fire Zone Layouts-Emergency Power Generating Buildings	

(UBP), Section-B-B	9.A-91
Figure 9.A-6—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, -31 Feet.....	9.A-92
Figure 9.A-7—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, -16 Feet.....	9.A-93
Figure 9.A-8—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +/-0 Feet	9.A-94
Figure 9.A-9—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +15 Feet.....	9.A-95
Figure 9.A-10—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +27 Feet.....	9.A-96
Figure 9.A-11—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +39 Feet.....	9.A-97
Figure 9.A-12—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +55 Feet.....	9.A-98
Figure 9.A-13—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +69 Feet.....	9.A-99
Figure 9.A-14—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +81 Feet.....	9.A-100
Figure 9.A-15—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +96 Feet.....	9.A-101
Figure 9.A-16—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, Section A-A.....	9.A-102
Figure 9.A-17—Fire Zone Layouts-Safeguard Buildings 2 and 3, -31 Feet.....	9.A-103
Figure 9.A-18—Fire Zone Layouts-Safeguard Buildings 2 and 3, -16 Feet.....	9.A-104
Figure 9.A-19—Fire Zone Layouts-Safeguard Buildings 2 and 3, +/-0 Feet.....	9.A-105
Figure 9.A-20—Fire Zone Layouts-Safeguard Buildings 2 and 3, +15 Feet.....	9.A-106
Figure 9.A-21—Fire Zone Layouts-Safeguard Buildings 2 and 3, +27 Feet.....	9.A-107
Figure 9.A-22—Fire Zone Layouts-Safeguard Buildings 2 and 3, +39 Feet.....	9.A-108
Figure 9.A-23—Fire Zone Layouts-Safeguard Buildings 2 and 3, +53 Feet.....	9.A-109
Figure 9.A-24—Fire Zone Layouts-Safeguard Buildings 2 and 3, +69 Feet.....	9.A-110
Figure 9.A-25—Fire Zone Layouts-Safeguard Buildings 2 and 3, +79 Feet.....	9.A-111
Figure 9.A-26—Fire Zone Layouts-Safeguard Buildings 2 and 3, +94 Feet.....	9.A-112
Figure 9.A-27—Fire Zone Layouts-Safeguard Buildings 2 and 3, Section B-B	9.A-113
Figure 9.A-28—Fire Zone Layouts-Safeguard Building (UJH and UJK):	

4, -31 Feet.....	9.A-114
Figure 9.A-29—Fire Zone Layouts-Safeguard Building (UJH and UJK):	
4, -16 Feet.....	9.A-115
Figure 9.A-30—Fire Zone Layouts-Safeguard Building (UJH and UJK):	
4, +/-0 Feet	9.A-116
Figure 9.A-31—Fire Zone Layouts-Safeguard Building (UJH and UJK):	
4, +15 Feet.....	9.A-117
Figure 9.A-32—Fire Zone Layouts-Safeguard Building (UJH and UJK):	
4, +26 Feet.....	9.A-118
Figure 9.A-33—Fire Zone Layouts-Safeguard Building (UJH and UJK):	
4, +39 Feet.....	9.A-119
Figure 9.A-34—Fire Zone Layouts-Safeguard Building (UJH and UJK):	
4, +55 Feet.....	9.A-120
Figure 9.A-35—Fire Zone Layouts-Safeguard Building (UJH and UJK):	
4, +69 Feet.....	9.A-121
Figure 9.A-36—Fire Zone Layouts-Safeguard Building (UJH and UJK):	
4, +81 Feet.....	9.A-122
Figure 9.A-37—Fire Zone Layouts-Safeguard Building (UJH and UJK):	
4, +96 Feet.....	9.A-123
Figure 9.A-38—Fire Zone Layouts-Safeguard Building (UJH and UJK):	
4, Section A-A.....	9.A-124
Figure 9.A-39—Fire Zone Layouts-Reactor Building, -50 Feet.....	9.A-125
Figure 9.A-40—Fire Zone Layouts-Reactor Building, -20 Feet.....	9.A-126
Figure 9.A-41—Fire Zone Layouts-Reactor Building, -8 Feet.....	9.A-127
Figure 9.A-42—Fire Zone Layouts-Reactor Building, +5 Feet.....	9.A-128
Figure 9.A-43—Fire Zone Layouts-Reactor Building, +17 Feet.....	9.A-129
Figure 9.A-44—Fire Zone Layouts-Reactor Building, +29 Feet.....	9.A-130
Figure 9.A-45—Fire Zone Layouts-Reactor Building, +45 Feet.....	9.A-131
Figure 9.A-46—Fire Zone Layouts-Reactor Building, +64 Feet.....	9.A-132
Figure 9.A-47—Fire Zone Layouts-Reactor Building, +79 Feet.....	9.A-133
Figure 9.A-48—Fire Zone Layouts-Reactor Building, +94 Feet.....	9.A-134
Figure 9.A-49—Fire Zone Layouts-Reactor Building, Section A-A.....	9.A-135
Figure 9.A-50—Fire Zone Layouts-Reactor Building, Section B-B.....	9.A-136
Figure 9.A-51—Fire Zone Layouts-Reactor Building, Section C-C.....	9.A-137
Figure 9.A-52—Fire Zone Layouts-Nuclear Auxiliary Building, -31 Feet.....	9.A-138

Figure 9.A-53—Fire Zone Layouts-Nuclear Auxiliary Building, -21 Feet	9.A-139
Figure 9.A-54—Fire Zone Layouts-Nuclear Auxiliary Building, -11 Feet	9.A-140
Figure 9.A-55—Fire Zone Layouts-Nuclear Auxiliary Building, +/-0 Feet	9.A-141
Figure 9.A-56—Fire Zone Layouts-Nuclear Auxiliary Building, +12 Feet	9.A-142
Figure 9.A-57—Fire Zone Layouts-Nuclear Auxiliary Building, +24 Feet	9.A-143
Figure 9.A-58—Fire Zone Layouts-Nuclear Auxiliary Building, +34 Feet	9.A-144
Figure 9.A-59—Fire Zone Layouts-Nuclear Auxiliary Building, +50 Feet	9.A-145
Figure 9.A-60—Fire Zone Layouts-Nuclear Auxiliary Building, +64 Feet	9.A-146
Figure 9.A-61—Fire Zone Layouts-Nuclear Auxiliary Building, +81 Feet	9.A-147
Figure 9.A-62—Fire Zone Layouts-Nuclear Auxiliary Building, +98 Feet	9.A-148
Figure 9.A-63—Fire Zone Layouts-Nuclear Auxiliary Building, Section A-A	9.A-149
Figure 9.A-64—Fire Zone Layouts-Nuclear Auxiliary Building, Section B-B	9.A-150
Figure 9.A-65—Fire Zone Layouts-Nuclear Auxiliary Building, Section C-C.....	9.A-151
Figure 9.A-66—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), -32 Feet.....	9.A-152
Figure 9.A-67—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), -21 Feet.....	9.A-153
Figure 9.A-68—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), -11 Feet.....	9.A-154
Figure 9.A-69—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), +/- 0 Feet.....	9.A-155
Figure 9.A-70—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), +12 Feet.....	9.A-156
Figure 9.A-71—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), +23 Feet.....	9.A-157
Figure 9.A-72—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), +36 Feet.....	9.A-158
Figure 9.A-73—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), +53 Feet.....	9.A-159
Figure 9.A-74—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), Section A-A	9.A-160
Figure 9.A-75—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), Section B-B	9.A-161

Figure 9.A-76—Fire Zone Layouts- Essential Service Water Building, +/-0 Feet	9.A-162
Figure 9.A-77—Fire Zone Layouts- Essential Service Water Building, +14 Feet.....	9.A-163
Figure 9.A-78—Fire Zone Layouts- Essential Service Water Building, +47 Feet.....	9.A-164
Figure 9.A-79—Fire Zone Layouts- Essential Service Water Building, +63 Feet.....	9.A-165
Figure 9.A-80—Fire Zone Layouts- Essential Service Water Building, +80 Feet.....	9.A-166
Figure 9.A-81—Fire Zone Layouts- Essential Service Water Building, +96 Feet.....	9.A-167
Figure 9.A-82—Fire Zone Layouts- Essential Service Water Building, Section A-A	9.A-168
Figure 9.A-83—Fire Zone Layouts- Essential Service Water Building, Section B-B	9.A-169
Figure 9.A-84—Fire Zone Layouts-Fuel Building, -31 Feet	9.A-170
Figure 9.A-85—Fire Zone Layouts-Fuel Building, -20 Feet	9.A-171
Figure 9.A-86—Fire Zone Layouts-Fuel Building, -11 Feet	9.A-172
Figure 9.A-87—Fire Zone Layouts-Fuel Building, +0 Feet	9.A-173
Figure 9.A-88—Fire Zone Layouts-Fuel Building, +12 Feet	9.A-174
Figure 9.A-89—Fire Zone Layouts-Fuel Building, +24 Feet	9.A-175
Figure 9.A-90—Fire Zone Layouts-Fuel Building, +36 Feet	9.A-176
Figure 9.A-91—Fire Zone Layouts-Fuel Building, +49 Feet	9.A-177
Figure 9.A-92—Fire Zone Layouts-Fuel Building, +64 Feet	9.A-178
Figure 9.A-93—Fire Zone Layouts-Fuel Building, +79 Feet	9.A-179
Figure 9.A-94—Fire Zone Layouts-Fuel Building, +90 Feet	9.A-180
Figure 9.A-95—Fire Zone Layouts-Fuel Building, Section A-A.....	9.A-181
Figure 9.A-96—Fire Zone Layouts-Fuel Building, Section B-B.....	9.A-182
Figure 9.A-97—Fire Zone Layouts-Fuel Building, Section C-C	9.A-183
Figure 9.A-98—[[Fire Zone Layouts- Access Building (UKE), -31 Feet]]	9.A-184
Figure 9.A-99—[[Fire Zone Layouts- Access Building (UKE), -13 Feet]]	9.A-185
Figure 9.A-100—[[Fire Zone Layouts- Access Building (UKE), +/- 0 Feet]]	9.A-186
Figure 9.A-101—[[Fire Zone Layouts- Access Building (UKE), +12 Feet]]	9.A-187
Figure 9.A-102—[[Fire Zone Layouts- Access Building (UKE), +25 Feet]]	9.A-188



Figure 9.A-103—[[Fire Zone Layouts- Access Building (UKE), +39 Feet]]	9.A-189
Figure 9.A-104—[[Fire Zone Layouts- Access Building (UKE), +54 Feet]]	9.A-190
Figure 9.A-105—[[Fire Zone Layouts- Access Building (UKE), Section A-A]]	9.A-191
Figure 9.A-106—[[Fire Zone Layouts- Access Building (UKE), Section B-B]]	9.A-192