

CHAPTER 9— AUXILIARY SYSTEMS

LIST OF FIGURES

Figure 9.1.2-1—Typical New Fuel Rack Array.....	9.1-15
Figure 9.1.2-2—Dry New Fuel Storage Racks.....	9.1-16
Figure 9.1.2-3—Spent Fuel Pool Elevation.....	9.1-17
Figure 9.1.2-4—New Fuel and Region 1 Spent Fuel Storage Rack Cross-Section	9.1-18
Figure 9.1.2-5—Region 2 Spent Fuel Storage Rack Cross-Section.....	9.1-19
Figure 9.1.2-6—Typical Spent Fuel Rack Array	9.1-20
Figure 9.1.2-7—Spent Fuel Storage Pool Layout.....	9.1-21
Figure 9.1.2-8—Fuel Storage and Handling Areas Layout.....	9.1-22
Figure 9.1.2-9—Cask Loading Pit Gates	9.1-23
Figure 9.1.3-1—Fuel Pool Cooling System.....	9.1-39
Figure 9.1.3-2—Fuel Pool Purification System	9.1-40
Figure 9.1.4-1—Refueling Machine	9.1-71
Figure 9.1.4-2—Fuel Assemblies Hoisting Mechanism	9.1-72
Figure 9.1.4-3—Fuel Transfer Tube Facility, Reactor Building.....	9.1-73
Figure 9.1.4-4—Fuel Transfer Tube Facility, Fuel Building	9.1-74
Figure 9.1.4-5—New Fuel Elevator.....	9.1-75
Figure 9.1.4-6—Spent Fuel Machine	9.1-76
Figure 9.1.4-7—Spent Fuel Cask Transfer Facility	9.1-77
Figure 9.1.4-8—Cask Loading Pit Penetration Assembly.....	9.1-78
Figure 9.2.1-1—Essential Service Water System Piping & Instrumentation Diagram	9.2-21
Figure 9.2.2-1—Component Cooling Water System Trains 1 through 4	9.2-94
Figure 9.2.2-2—Component Cooling Water System Common Loop 1	9.2-96
Figure 9.2.2-3—Component Cooling Water System Common Loop 2.....	9.2-103
Figure 9.2.2-4—Component Cooling Water System Dedicated CCWS Trains	9.2-111
Figure 9.2.5-1—Ultimate Heat Sink Piping and Instrumentation Diagram.....	9.2-133
Figure 9.2.5-2—[[Conceptual Site-Specific UHS Systems]]	9.2-134
Figure 9.2.5-3—Cross-Section of UHS Tower Basin.....	9.2-135

Figure 9.2.7-1—Seal Water Supply System	9.2-143
Figure 9.2.8-1—Safety Chilled Water System Diagram.....	9.2-169
Figure 9.2.9-1—[[Conceptual Site-Specific Raw Water Supply System]]	9.2-174
Figure 9.3.1-1—Compressed Air Generation System	9.3-5
Figure 9.3.1-2—Compressed Air Distribution System	9.3-6
Figure 9.3.2-1—Nuclear Sampling System.....	9.3-30
Figure 9.3.2-2—Severe Accident Sampling System.....	9.3-39
Figure 9.3.3-1—Nuclear Island Drain and Vent System	9.3-47
Figure 9.3.4-1—Chemical and Volume Control System	9.3-81
Figure 9.3.4-2—Coolant Purification System.....	9.3-90
Figure 9.3.4-3—Coolant Degasification System	9.3-95
Figure 9.3.4-4—Reactor Boron and Water Makeup System	9.3-97
Figure 9.3.4-5—Coolant Supply and Storage System	9.3-99
Figure 9.3.4-6—Coolant Treatment System	9.3-102
Figure 9.4.1-1—Control Room Air Intake and CREF (Iodine Filtration) Train Subsystem	9.4-16
Figure 9.4.1-2—Control Room Air Conditioning and Recirculation Air Handling Subsystem	9.4-17
Figure 9.4.1-3—Control Room Envelope Air Supply and Recirculation Subsystem	9.4-18
Figure 9.4.2-1—Fuel Building Ventilation System	9.4-30
Figure 9.4.3-1—Nuclear Auxiliary Building Supply Air Filtration and A/C Trains	9.4-41
Figure 9.4.3-2—Nuclear Auxiliary Building Air Supply and Exhaust Subsystem	9.4-42
Figure 9.4.3-3—Nuclear Auxiliary Building Exhaust Filtration Trains Subsystem...	9.4-43
Figure 9.4.3-4—Nuclear Auxiliary Building Exhaust Iodine Filtration Train Subsystem	9.4-44
Figure 9.4.3-5—Nuclear Auxiliary Building Laboratory Iodine Exhaust Filtration Train	9.4-45
Figure 9.4.5-1—Safeguard Building Controlled-Area Ventilation System Air Supply Subsystem	9.4-64
Figure 9.4.5-2—Safeguard Building Controlled-Area Ventilation System Exhaust Air Subsystem.....	9.4-65
Figure 9.4.6-1—Safeguard Building Electrical Divisions 1 and 4 Air Intake	9.4-81
Figure 9.4.6-2—Safeguard Building Electrical Divisions 1 and 4 Air Supply and Exhaust.....	9.4-82

Figure 9.4.6-3—Safeguard Building Electrical Divisions 2 and 3 Air Intake	9.4-83
Figure 9.4.6-4—Safeguard Building Electrical Divisions 2 and 3 Air Supply and Exhaust.....	9.4-84
Figure 9.4.7-1—Containment Building Low Flow and Full Flow Purge Supply Subsystem	9.4-98
Figure 9.4.7-2—Containment Building Low Flow and Full Flow Purge Exhaust Subsystem	9.4-99
Figure 9.4.7-3—Containment Building Internal Filtration Subsystem	9.4-100
Figure 9.4.7-4—Containment Building Cooling Subsystem.....	9.4-101
Figure 9.4.7-5—Containment Building Service Compartments Cooling Subsystem	9.4-102
Figure 9.4.8-1—Radioactive Waste Building Ventilation System Air Supply	9.4-112
Figure 9.4.8-2—Radioactive Waste Building Ventilation System Exhaust Air Station.....	9.4-113
Figure 9.4.9-1—Emergency Power Generating Building Ventilation System	9.4-123
Figure 9.4.11-1—Essential Service Water Pump Building Ventilation System.....	9.4-137
Figure 9.4.12-1—Main Steam and Feedwater Valve Room Ventilation System ..	9.4-142
Figure 9.4.13-1—Typical Configuration of Smoke Confinement System.....	9.4-147
Figure 9.4.13-2—Deleted.....	9.4-148
Figure 9.4.14-1—Access Building Ventilation System – Supply Air Subsystem...	9.4-158
Figure 9.4.14-2—Access Building Ventilation System – Supply and Exhaust Air Subsystem.....	9.4-159
Figure 9.5.1-1—Fire Water Distribution System	9.5-51
Figure 9.5.1-2—Spray Deluge Systems Layout.....	9.5-64
Figure 9.5.1-3—Sprinkler Systems Layout	9.5-66
Figure 9.5.1-4—Gaseous Fire Extinguishing Systems Layout	9.5-67
Figure 9.5.2-1—Portable Wireless Communication Systems	9.5-80
Figure 9.5.2-2—Sound-Powered System	9.5-81
Figure 9.5.4-1—Emergency Diesel Generator Fuel Oil Storage and Transfer System	9.5-102
Figure 9.5.5-1—Emergency Diesel Generator Cooling Water System.....	9.5-112
Figure 9.5.6-1—Emergency Diesel Generator Starting Air System.....	9.5-122
Figure 9.5.7-1—Emergency Diesel Generator Lubricating Oil System.....	9.5-134
Figure 9.5.8-1—Emergency Diesel Generator Air Intake and Exhaust System ...	9.5-141

Figure 9A-1—Fire Zone Layouts-Emergency Power Generating Buildings (UBP), +/-0 Feet.....	9A-94
Figure 9A-2—Fire Zone Layouts-Emergency Power Generating Buildings (UBP), +33 Feet.....	9A-95
Figure 9A-3—Fire Zone Layouts-Emergency Power Generating Buildings (UBP), +52 Feet.....	9A-96
Figure 9A-4—Fire Zone Layouts-Emergency Power Generating Buildings (UBP), Section-A-A	9A-97
Figure 9A-5—Fire Zone Layouts-Emergency Power Generating Buildings (UBP), Section-B-B	9A-98
Figure 9A-6—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, -31 Feet.....	9A-99
Figure 9A-7—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, -16 Feet.....	9A-100
Figure 9A-8—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +/-0 Feet.....	9A-101
Figure 9A-9—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +15 Feet.....	9A-102
Figure 9A-10—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +27 Feet.....	9A-103
Figure 9A-11—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +39 Feet.....	9A-104
Figure 9A-12—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +55 Feet.....	9A-105
Figure 9A-13—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +69 Feet.....	9A-106
Figure 9A-14—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +81 Feet.....	9A-107
Figure 9A-15—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, +96 Feet.....	9A-108
Figure 9A-16—Fire Zone Layouts-Safeguard Building (UJH and UJK): 1, Section A-A	9A-109
Figure 9A-17—Fire Zone Layouts-Safeguard Buildings 2 and 3, -31 Feet.....	9A-110
Figure 9A-18—Fire Zone Layouts-Safeguard Buildings 2 and 3, -16 Feet.....	9A-111
Figure 9A-19—Fire Zone Layouts-Safeguard Buildings 2 and 3, +/-0 Feet.....	9A-112
Figure 9A-20—Fire Zone Layouts-Safeguard Buildings 2 and 3, +15 Feet.....	9A-113
Figure 9A-21—Fire Zone Layouts-Safeguard Buildings 2 and 3, +27 Feet.....	9A-114

Figure 9A-22—Fire Zone Layouts-Safeguard Buildings 2 and 3, +39 Feet.....	9A-115
Figure 9A-23—Fire Zone Layouts-Safeguard Buildings 2 and 3, +53 Feet.....	9A-116
Figure 9A-24—Fire Zone Layouts-Safeguard Buildings 2 and 3, +69 Feet.....	9A-117
Figure 9A-25—Fire Zone Layouts-Safeguard Buildings 2 and 3, +79 Feet.....	9A-118
Figure 9A-26—Fire Zone Layouts-Safeguard Buildings 2 and 3, +94 Feet.....	9A-119
Figure 9A-27—Fire Zone Layouts-Safeguard Buildings 2 and 3, Section B-B	9A-120
Figure 9A-28—Fire Zone Layouts-Safeguard Building (UJH and UJK): 4, -31 Feet.....	9A-121
Figure 9A-29—Fire Zone Layouts-Safeguard Building (UJH and UJK): 4, -16 Feet.....	9A-122
Figure 9A-30—Fire Zone Layouts-Safeguard Building (UJH and UJK): 4, +/-0 Feet.....	9A-123
Figure 9A-31—Fire Zone Layouts-Safeguard Building (UJH and UJK): 4, +15 Feet.....	9A-124
Figure 9A-32—Fire Zone Layouts-Safeguard Building (UJH and UJK): 4, +26 Feet.....	9A-125
Figure 9A-33—Fire Zone Layouts-Safeguard Building (UJH and UJK): 4, +39 Feet.....	9A-126
Figure 9A-34—Fire Zone Layouts-Safeguard Building (UJH and UJK): 4, +55 Feet.....	9A-127
Figure 9A-35—Fire Zone Layouts-Safeguard Building (UJH and UJK): 4, +69 Feet.....	9A-128
Figure 9A-36—Fire Zone Layouts-Safeguard Building (UJH and UJK): 4, +81 Feet.....	9A-129
Figure 9A-37—Fire Zone Layouts-Safeguard Building (UJH and UJK): 4, +96 Feet.....	9A-130
Figure 9A-38—Fire Zone Layouts-Safeguard Building (UJH and UJK): 4, Section A-A	9A-131
Figure 9A-39—Fire Zone Layouts-Reactor Building, -50 Feet.....	9A-132
Figure 9A-40—Fire Zone Layouts-Reactor Building, -20 Feet.....	9A-133
Figure 9A-41—Fire Zone Layouts-Reactor Building, -8 Feet.....	9A-134
Figure 9A-42—Fire Zone Layouts-Reactor Building, +5 Feet.....	9A-135
Figure 9A-43—Fire Zone Layouts-Reactor Building, +17 Feet.....	9A-136
Figure 9A-44—Fire Zone Layouts-Reactor Building, +29 Feet.....	9A-137
Figure 9A-45—Fire Zone Layouts-Reactor Building, +45 Feet.....	9A-138
Figure 9A-46—Fire Zone Layouts-Reactor Building, +64 Feet.....	9A-139

Figure 9A-47—Fire Zone Layouts-Reactor Building, +79 Feet.....	9A-140
Figure 9A-48—Fire Zone Layouts-Reactor Building, +94 Feet.....	9A-141
Figure 9A-49—Fire Zone Layouts-Reactor Building, Section A-A.....	9A-142
Figure 9A-50—Fire Zone Layouts-Reactor Building, Section B-B.....	9A-143
Figure 9A-51—Fire Zone Layouts-Reactor Building, Section C-C.....	9A-144
Figure 9A-52—Fire Zone Layouts-Nuclear Auxiliary Building, -31 Feet	9A-145
Figure 9A-53—Fire Zone Layouts-Nuclear Auxiliary Building, -21 Feet	9A-146
Figure 9A-54—Fire Zone Layouts-Nuclear Auxiliary Building, -11 Feet	9A-147
Figure 9A-55—Fire Zone Layouts-Nuclear Auxiliary Building, +/-0 Feet	9A-148
Figure 9A-56—Fire Zone Layouts-Nuclear Auxiliary Building, +12 Feet	9A-149
Figure 9A-57—Fire Zone Layouts-Nuclear Auxiliary Building, +24 Feet	9A-150
Figure 9A-58—Fire Zone Layouts-Nuclear Auxiliary Building, +34 Feet	9A-151
Figure 9A-59—Fire Zone Layouts-Nuclear Auxiliary Building, +50 Feet	9A-152
Figure 9A-60—Fire Zone Layouts-Nuclear Auxiliary Building, +64 Feet	9A-153
Figure 9A-61—Fire Zone Layouts-Nuclear Auxiliary Building, +81 Feet	9A-154
Figure 9A-62—Fire Zone Layouts-Nuclear Auxiliary Building, +98 Feet	9A-155
Figure 9A-63—Fire Zone Layouts-Nuclear Auxiliary Building, Section A-A.....	9A-156
Figure 9A-64—Fire Zone Layouts-Nuclear Auxiliary Building, Section B-B.....	9A-157
Figure 9A-65—Fire Zone Layouts-Nuclear Auxiliary Building, Section C-C	9A-158
Figure 9A-66—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), -32 Feet.....	9A-159
Figure 9A-67—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), -21 Feet.....	9A-160
Figure 9A-68—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), -11 Feet.....	9A-161
Figure 9A-69—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), +/- 0 Feet.....	9A-162
Figure 9A-70—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), +12 Feet.....	9A-163
Figure 9A-71—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), +23 Feet.....	9A-164
Figure 9A-72—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), +36 Feet.....	9A-165
Figure 9A-73—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), +53 Feet.....	9A-166

Figure 9A-74—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), Section A-A	9A-167
Figure 9A-75—Fire Zone Layouts-Radioactive Waste Processing Building (UKS), Section B-B	9A-168
Figure 9A-76—Fire Zone Layouts- Essential Service Water Building, +/-0 Feet ...	9A-169
Figure 9A-77—Fire Zone Layouts- Essential Service Water Building, +14 Feet ...	9A-170
Figure 9A-78—Fire Zone Layouts- Essential Service Water Building, +47 Feet ...	9A-171
Figure 9A-79—Fire Zone Layouts- Essential Service Water Building, +63 Feet ...	9A-172
Figure 9A-80—Fire Zone Layouts- Essential Service Water Building, +80 Feet ...	9A-173
Figure 9A-81—Fire Zone Layouts- Essential Service Water Building, +96 Feet ...	9A-174
Figure 9A-82—Fire Zone Layouts- Essential Service Water Building, Section A-A	9A-175
Figure 9A-83—Fire Zone Layouts- Essential Service Water Building, Section B-B	9A-176
Figure 9A-84—Fire Zone Layouts-Fuel Building, -31 Feet	9A-177
Figure 9A-85—Fire Zone Layouts-Fuel Building, -20 Feet	9A-178
Figure 9A-86—Fire Zone Layouts-Fuel Building, -11 Feet	9A-179
Figure 9A-87—Fire Zone Layouts-Fuel Building, +0 Feet	9A-180
Figure 9A-88—Fire Zone Layouts-Fuel Building, +12 Feet	9A-181
Figure 9A-89—Fire Zone Layouts-Fuel Building, +24 Feet	9A-182
Figure 9A-90—Fire Zone Layouts-Fuel Building, +36 Feet	9A-183
Figure 9A-91—Fire Zone Layouts-Fuel Building, +49 Feet	9A-184
Figure 9A-92—Fire Zone Layouts-Fuel Building, +64 Feet	9A-185
Figure 9A-93—Fire Zone Layouts-Fuel Building, +79 Feet	9A-186
Figure 9A-94—Fire Zone Layouts-Fuel Building, +90 Feet	9A-187
Figure 9A-95—Fire Zone Layouts-Fuel Building, Section A-A.....	9A-188
Figure 9A-96—Fire Zone Layouts-Fuel Building, Section B-B.....	9A-189
Figure 9A-97—Fire Zone Layouts-Fuel Building, Section C-C	9A-190
Figure 9A-98—[[Fire Zone Layouts- Access Building (UKE), -31 Feet]]	9A-191
Figure 9A-99—[[Fire Zone Layouts- Access Building (UKE), -13 Feet]]	9A-192
Figure 9A-100—[[Fire Zone Layouts- Access Building (UKE), +/- 0 Feet]]	9A-193
Figure 9A-101—[[Fire Zone Layouts- Access Building (UKE), +12 Feet]]	9A-194
Figure 9A-102—[[Fire Zone Layouts- Access Building (UKE), +25 Feet]]	9A-195
Figure 9A-103—[[Fire Zone Layouts- Access Building (UKE), +39 Feet]]	9A-196

Figure 9A-104—[[Fire Zone Layouts- Access Building (UKE), +54 Feet]]	9A-197
Figure 9A-105—[[Fire Zone Layouts- Access Building (UKE), Section A-A]]	9A-198
Figure 9A-106—[[Fire Zone Layouts- Access Building (UKE), Section B-B]]	9A-199