

FSAR List of Figures

1.0 Introduction and General Description of the Plant

Figure 1.1-1— {50 mi (80 km) Surrounding Area}	1-19
Figure 1.1-2— {10 mi (16 km) Surrounding Area}	1-20
Figure 1.1-3— {Site Area Map}.....	1-21
Figure 1.2-1— {Callaway Plant Unit 2 Nuclear and Turbine Building Island Layout}	1-25

2.0 Site Characteristics

Figure 2.1-1— {Site Area Map}	2-32
Figure 2.1-2— {50 Mile (80 km) Surrounding Area}.....	2-33
Figure 2.1-3— {10 Mile (16 km) Surrounding Area}.....	2-34
Figure 2.1-4— {Site Boundaries}.....	2-35
Figure 2.1-5— {Exclusion Area Boundaries}	2-36
Figure 2.1-6— {Enlarged Site Area Map}	2-37
Figure 2.1-7— {Callaway Plant Unit 2 Enlargement}.....	2-38
Figure 2.1-8— {Exclusion Area and Plant Site Area}	2-39
Figure 2.1-9— {10 Mile (16 km) Radius Map}	2-40
Figure 2.1-10—{10 Mile (16 km) 2000 Population Distribution}	2-41
Figure 2.1-11—{10 Mile (16 km) 2010 Population Distribution}	2-42
Figure 2.1-12—{10 Mile (16 km) 2020 Population Distribution}	2-43
Figure 2.1-13— {10 Mile (16 km) 2030 Population Distribution}	2-44
Figure 2.1-14— {10 Mile (16 km) 2040 Population Distribution}	2-45
Figure 2.1-15— {10 Mile (16 km) 2050 Population Distribution}	2-46
Figure 2.1-16—{10 Mile (16 km) 2050 Population Distribution}	2-47
Figure 2.1-17—{50 Mile (80 km) 2000 Vicinity}	2-48
Figure 2.1-18— {50 Mile (80 km) 2000 Population Distribution}	2-49
Figure 2.1-19— {50 Mile (80 km) 2010 Population Distribution}	2-50
Figure 2.1-20—{50 Mile (80 km) 2020 Population Distribution}	2-51
Figure 2.1-21— {50 Mile (80 km) 2030 Population Distribution}	2-52
Figure 2.1-22—{50 Mile (80 km) 2040 Population Distribution}	2-53
Figure 2.1-23— {50 Mile (80 km) 2000 Population Distribution}	2-54
Figure 2.1-24—{50 Mile (80 km) 2060 Population Distribution}	2-55
Figure 2.1-25—{Protected Area, Exclusion Area, Restricted Area, and Low Population Zone} ...	2-56
Figure 2.1-26— {LPZ and Emergency Planning Evacuation Routes}	2-57
Figure 2.1-27— {10 Mile (16 km) 2057 Population Distribution}	2-58
Figure 2.1-28— {10 Mile (16 km) 2017 Population Distribution}	2-59
Figure 2.1-29— {50 Mile (80 km) 2057 Population Distribution}	2-60
Figure 2.1-30—{50 Mile (80 km) 2017 Population Distribution}	2-61
Figure 2.1-31— {Cumulative Populations}.....	2-62
Figure 2.2-1— {Location Map, Facilities, Land, and Water Transportation Routes}	2-103

FSAR List of Figures

Figure 2.2-2— {Low Altitude Air Routes and Airports}.....	2-104
Figure 2.2-3— {IFR Enroute High Altitude Air Routes}	2-105
Figure 2.2-4— {Location of Nearest Pipeline}	2-106
Figure 2.3-1— {Annual Average Number of Tornadoes 1950-1995}	2-428
Figure 2.3-2— {Average Number of Strong Violent (F2-F5) Tornadoes, 1950-1995}	2-429
Figure 2.3-3— {Date of Maximum Tornado Threat}.....	2-430
Figure 2.3-4— {Five-Year Lightning Flash Density Map}.....	2-431
Figure 2.3-5— {Callaway Plant Wind Rose - 2004-2006, 10 m}	2-432
Figure 2.3-6— {Callaway Plant Wind Rose - 2004-2006, 60 m}	2-433
Figure 2.3-7— {Callaway Plant Wind Rose - 2004, 10 m}	2-434
Figure 2.3-8— {Callaway Plant Wind Rose - 2004, 60 m}	2-435
Figure 2.3-9— {Callaway Plant Wind Rose - 2005, 10 m}	2-436
Figure 2.3-10—{Callaway Plant Wind Rose - 2005, 60 m}.....	2-437
Figure 2.3-11—{Callaway Plant Wind Rose - 2006, 10 m}	2-438
Figure 2.3-12—{Callaway Plant Wind Rose - 2006, 60 m}.....	2-439
Figure 2.3-13—{Callaway Plant Wind Rose - January - 2004-2006, 10 m}.....	2-440
Figure 2.3-14—{Callaway Plant Wind Rose - February - 2004-2006, 10 m}.....	2-441
Figure 2.3-15—{Callaway Plant Wind Rose - March - 2004-2006, 10 m}	2-442
Figure 2.3-16—{Callaway Plant Wind Rose - April - 2004-2006, 10 m}.....	2-443
Figure 2.3-17—{Callaway Plant Wind Rose - May - 2004-2006, 10 m}	2-444
Figure 2.3-18—{Callaway Plant Wind Rose - June - 2004-2006, 10 m}.....	2-445
Figure 2.3-19—{Callaway Plant Wind Rose - July - 2004-2006, 10 m}.....	2-446
Figure 2.3-20—{Callaway Plant Wind Rose - August - 2004-2006, 10 m}	2-447
Figure 2.3-21—{Callaway Plant Wind Rose - September - 2004-2006, 10 m}.....	2-448
Figure 2.3-22—{Callaway Plant Wind Rose - October - 2004-2006, 10 m}	2-449
Figure 2.3-23—{Callaway Plant Wind Rose - November - 2004-2006, 10 m}.....	2-450
Figure 2.3-24—{Callaway Plant Wind Rose - December - 2004-2006, 10 m}	2-451
Figure 2.3-25—{Callaway Plant Wind Rose - January - 2004-2006, 60 m}.....	2-452
Figure 2.3-26—{Callaway Plant Wind Rose - February - 2004-2006, 60 m}.....	2-453
Figure 2.3-27—{Callaway Plant Wind Rose - March - 2004-2006, 60 m}	2-454
Figure 2.3-28—{Callaway Plant Wind Rose - April - 2004-2006, 60 m}.....	2-455
Figure 2.3-29—{Callaway Plant Wind Rose - May - 2004-2006, 60 m}	2-456
Figure 2.3-30—{Callaway Plant Wind Rose - June - 2004-2006, 60 m}.....	2-457
Figure 2.3-31—{Callaway Plant Wind Rose - July - 2004-2006, 60 m}.....	2-458
Figure 2.3-32—{Callaway Plant Wind Rose - August - 2004-2006, 60 m}	2-459
Figure 2.3-33—{Callaway Plant Wind Rose - September - 2004-2006, 60 m}.....	2-460
Figure 2.3-34—{Callaway Plant Wind Rose - October - 2004-2006, 60 m}	2-461
Figure 2.3-35—{Callaway Plant Wind Rose - November - 2004-2006, 60 m}.....	2-462
Figure 2.3-36—{Callaway Plant Wind Rose - December - 2004-2006, 60 m}	2-463
Figure 2.3-37—{Columbia, MO Wind Rose - 2004-2006}	2-464
Figure 2.3-38—{St. Louis, MO Wind Rose - 2004-2006}.....	2-465
Figure 2.3-39—{Kansas City, MO Wind Rose - 2004-2006}.....	2-466
Figure 2.3-40—{Jefferson City, MO Wind Rose - 2004-2006}.....	2-467

Figure 2.3-41—{Vichy Rolla, MO Wind Rose - 2004-2006}	2-468
Figure 2.3-42—{Callaway Plant Precipitation Wind Rose - 2004, 10 m}	2-469
Figure 2.3-43—{Callaway Plant Precipitation Wind Rose - 2004, 60 m}	2-470
Figure 2.3-44—{Callaway Plant Precipitation Wind Rose - 2005, 10 m}	2-471
Figure 2.3-45—{Callaway Plant Precipitation Wind Rose - 2005, 60 m}	2-472
Figure 2.3-46—{Callaway Plant Precipitation Wind Rose - 2006, 10 m}	2-473
Figure 2.3-47—{Callaway Plant Precipitation Wind Rose - 2006, 60 m}	2-474
Figure 2.3-48—{Callaway Plant Precipitation Wind Rose - 2004-2006, 10 m, All Precipitation Hours}	2-475
Figure 2.3-49—{Callaway Plant Precipitation Wind Rose - 2004-2006, 60 m, All Precipitation Hours}	2-476
Figure 2.3-50—{Callaway Plant Precipitation Wind Rose - January 2004-2006, 10 m, All Precipitation Hours}	2-477
Figure 2.3-51—{Callaway Plant Precipitation Wind Rose - February 2004-2006, 10 m, All Precipitation Hours}	2-478
Figure 2.3-52—{Callaway Plant Precipitation Wind Rose - March 2004-2006, 10 m, All Precipitation Hours}	2-479
Figure 2.3-53—{Callaway Plant Precipitation Wind Rose - April 2004-2006, 10 m, All Precipitation Hours}	2-480
Figure 2.3-54—{Callaway Plant Precipitation Wind Rose - May 2004-2006, 10 m, All Precipitation Hours}	2-481
Figure 2.3-55—{Callaway Plant Precipitation Wind Rose - June 2004-2006, 10 m, All Precipitation Hours}	2-482
Figure 2.3-56—{Callaway Plant Precipitation Wind Rose - July 2004-2006, 10 m, All Precipitation Hours}	2-483
Figure 2.3-57—{Callaway Plant Precipitation Wind Rose - August 2004-2006, 10 m, All Precipitation Hours}	2-484
Figure 2.3-58—{Callaway Plant Precipitation Wind Rose - September 2004-2006, 10 m, All Precipitation Hours}	2-485
Figure 2.3-59—{Callaway Plant Precipitation Wind Rose - October 2004-2006, 10 m, All Precipitation Hours}	2-486
Figure 2.3-60—{Callaway Plant Precipitation Wind Rose - November 2004-2006, 10 m, All Precipitation Hours}	2-487
Figure 2.3-61—{Callaway Plant Precipitation Wind Rose - December 2004-2006, 10 m, All Precipitation Hours}	2-488
Figure 2.3-62—{Callaway Plant Precipitation Wind Rose - January 2004-2006, 60 m, All Precipitation Hours}	2-489
Figure 2.3-63—{Callaway Plant Precipitation Wind Rose - February 2004-2006, 60 m, All Precipitation Hours}	2-490
Figure 2.3-64—{Callaway Plant Precipitation Wind Rose - March 2004-2006, 60 m, All Precipitation Hours}	2-491
Figure 2.3-65—{Callaway Plant Precipitation Wind Rose - April 2004-2006, 60 m, All Precipitation Hours}	2-492
Figure 2.3-66—{Callaway Plant Precipitation Wind Rose - May 2004-2006, 60 m, All Precipitation Hours}	2-493

Figure 2.3-67—{Callaway Plant Precipitation Wind Rose - June 2004-2006, 60 m, All Precipitation Hours}	2-494
Figure 2.3-68—{Callaway Plant Precipitation Wind Rose - July 2004-2006, 60 m, All Precipitation Hours}	2-495
Figure 2.3-69—{Callaway Plant Precipitation Wind Rose - August 2004-2006, 60 m, All Precipitation Hours}	2-496
Figure 2.3-70—{Callaway Plant Precipitation Wind Rose - September 2004-2006, 60 m, All Precipitation Hours}	2-497
Figure 2.3-71—{Callaway Plant Precipitation Wind Rose - October 2004-2006, 60 m, All Precipitation Hours}	2-498
Figure 2.3-72—{Callaway Plant Precipitation Wind Rose - November 2004-2006, 60 m, All Precipitation Hours}	2-499
Figure 2.3-73—{Callaway Plant Precipitation Wind Rose - December 2004-2006, 60 m, All Precipitation Hours}	2-500
Figure 2.3-74—{Monthly Average Mixing Height Values (Springfield, MO)}	2-501
Figure 2.3-75—{Topography Within 1 Mile of the Callaway Plant Site}	2-502
Figure 2.3-76—{Topography Within 5 Miles of the Callaway Plant Site}	2-503
Figure 2.3-77—{Topography Within 50 Miles of the Callaway Plant Site}	2-504
Figure 2.3-78—{Maximum Elevation Versus Distance Within 50 Miles of the Callaway Plant Site}	2-505
Figure 2.3-79—{Callaway Site Map with Meteorological Tower Location}	2-506
Figure 2.3-80—{Detailed Topography within 8 km (5 mi)}	2-507
Figure 2.3-81—{Callaway Site Plan and Control Room Location}	2-508
Figure 2.4-1— {Plant Site Topography}	2-733
Figure 2.4-2— {Site Utilization Plant Layout}	2-734
Figure 2.4-3— {Missouri River Basin and Auxvasse Creek Watershed}	2-735
Figure 2.4-4— {Mean, Maximum and Minimum Streamflows for the Hermann, MO USGS 06934500, 1957 through 2006}	2-736
Figure 2.4-5— {Mean, Maximum and Minimum Streamflows for the Boonville, MO USGS 06909000, 1957 through 2007}	2-737
Figure 2.4-6— {Tributaries and Streams within the Auxvasse Creek Watershed}	2-738
Figure 2.4-7— {USGS Gauges Near Callaway Plant Unit 2 Site}	2-739
Figure 2.4-8— {Missouri River Main Stem and Osage River Dam System}	2-740
Figure 2.4-9— {Callaway County Surface Water Use}	2-741
Figure 2.4-10—{Surface Water Intakes 50 Mile (80 Km) Radius}	2-742
Figure 2.4-11—{Dams Within Auxvasse Creek Watershed}	2-743
Figure 2.4-12—{Peak Streamflow at Boonville and Hermann}	2-744
Figure 2.4-13—{Site Layout}	2-745
Figure 2.4-14—{Site Grading Plan}	2-746
Figure 2.4-15—{Sub-Basin Site Drainage Delineation}	2-747
Figure 2.4-16—{HEC-HMS Hydrologic Diagram}	2-748
Figure 2.4-17—{Location of Stormwater Runoff Ponds}	2-749
Figure 2.4-18—{Auxvasse Creek Watershed Sub-Basins Delineation}	2-750
Figure 2.4-19—{HEC-HMS Model Set Up}	2-751

FSAR List of Figures

Figure 2.4-20—{Sub-Basin 80004 Logan Ck2 Hydrograph}	2-752
Figure 2.4-21—{Sub-Basin 80004 Auxvasse Ck1 Hydrograph}	2-753
Figure 2.4-22—{Sub-Basin 80004 Auxvasse Ck3 Hydrograph}	2-754
Figure 2.4-23—{Sub-Basin 80004 Auxvasse Ck2 Hydrograph}	2-755
Figure 2.4-24—{Sub-Basin 80003 Auxvasse Ck5 Hydrograph}	2-756
Figure 2.4-25—{Sub-Basin 80003 Auxvasse Ck4 Hydrograph}	2-757
Figure 2.4-26—{Storage Inflow & Outflow Thunderbird Lake Lower}	2-758
Figure 2.4-27—{HEC-RAS Cross Section Cut Lines}	2-759
Figure 2.4-28—{Specific HEC-RAS Cross Section Cut Lines }	2-760
Figure 2.4-29—{Auxvasse Creek Surface Water Profile}	2-761
Figure 2.4-30—{Streams and Lake Near Site}	2-762
Figure 2.4-31—{Dams Within a 5 Mile (8 km) Radius}	2-763
Figure 2.4-32—{Missouri River Mainstem and Osage River Dam}	2-764
Figure 2.4-33—{Dams Within Auxvasse Creek Watershed}	2-765
Figure 2.4-34—{Schematic Layout of Callaway Plant Unit 2 Site}	2-766
Figure 2.4-35—{Digital Tectonic Activity Map of the Earth}	2-767
Figure 2.4-36—{Site Location}	2-768
Figure 2.4-37—{Low Flow Stage-Discharge Curve for Boonville Station}	2-769
Figure 2.4-38—{Low Flow Stage-Discharge Curve for Hermann Station}	2-770
Figure 2.4-39—{Low Water Level Data of Boonville Station and Curve Fitting}	2-771
Figure 2.4-40—{Low Water Level Data of Hermann Station and Curve Fitting}	2-772
Figure 2.4-41—{Regional Physiographic Provinces}	2-773
Figure 2.4-42—{Regional Extent of Glaciation and Alluvium}	2-774
Figure 2.4-43—{Regional Vertical Sequence of Aquifers}	2-775
Figure 2.4-44—{Aquifer Systems of Missouri}	2-776
Figure 2.4-45—{Aquifer Systems of Northern, Western, and Southern Missouri}	2-777
Figure 2.4-46—{MDNR Central Missouri Area and Groundwater Transition Zone}	2-778
Figure 2.4-47—{Missouri River and Alluvial Aquifer Section}	2-779
Figure 2.4-48—{Hydrogeological Units}	2-780
Figure 2.4-49—{Hydrogeologic Study Area with Site Investigation Locations}	2-781
Figure 2.4-50—{Hydrogeologic Site Investigation Locations - Inset}	2-782
Figure 2.4-51—{Hydrogeologic Study Area Public and Private Wells}	2-783
Figure 2.4-52—{Missouri Drought Susceptibility}	2-784
Figure 2.4-53—{Groundwater Monitoring Hydrographs, Audrain and Boone Counties}	2-785
Figure 2.4-54—{Groundwater Monitoring Hydrographs, Callaway and Gasconade Counties}	2-786
Figure 2.4-55—{Groundwater Monitoring Hydrographs, Montgomery and Osage Counties}	2-787
Figure 2.4-56—{Groundwater Elevation versus Time, Graydon Chert Aquifer Wells}	2-788
Figure 2.4-57—{Precipitation versus Time, Columbia Regional Airport Station}	2-789
Figure 2.4-58—{Surface Water Elevation versus Time, Plateau Ponds}	2-790
Figure 2.4-59—{Groundwater Elevation and Precipitation versus Time}	2-791
Figure 2.4-60—{Potentiometric Surface Map, Graydon Chert Aquifer, May 2007}	2-792
Figure 2.4-61—{Potentiometric Surface Map, Graydon Chert Aquifer, August 2007}	2-793
Figure 2.4-62—{Potentiometric Surface Map, Graydon Chert Aquifer, November 2007}	2-794

FSAR List of Figures

Figure 2.4-63—{Potentiometric Surface Map, Graydon Chert Aquifer, January 2008}.....	2-795
Figure 2.4-64—{Groundwater Elevation versus Time, Aquitard}	2-796
Figure 2.4-65—{Groundwater Elevation versus Time, Cotter-Jefferson City Aquifer Well}.....	2-797
Figure 2.4-66—{Surface Water Elevation versus Time, Lakes and Auxvasse Creek}	2-798
Figure 2.4-67—{Surface Water Elevation versus Time, Mud and Logan Creeks}	2-799
Figure 2.4-68—{Potentiometric Surface Map, Cotter-Jefferson City Aquifer, May 2007}	2-800
Figure 2.4-69—{Potentiometric Surface Map, Cotter-Jefferson City Aquifer, August 2007}	2-801
Figure 2.4-70—{Potentiometric Surface Map, Cotter-Jefferson City Aquifer, November 2007}.....	2-802
Figure 2.4-71—{Potentiometric Surface Map, Cotter-Jefferson City Aquifer, January 2008}	2-803
Figure 2.4-72—{Groundwater Elevation versus Time, Missouri River Alluvial Aquifer Wells}.....	2-804
Figure 2.4-73—{Potentiometric Surface Map, Missouri River Alluvial Aquifer, August 2007}	2-805
Figure 2.4-74—{Potentiometric Surface Map, Missouri River Alluvial Aquifer, November 2007}	2-806
Figure 2.4-75—{Potentiometric Surface Map, Missouri River Alluvial Aquifer, January 2008}.....	2-807
Figure 2.4-76—{Layer 1 Boundary Conditions}	2-808
Figure 2.4-77—{Layer 2 Boundary Conditions}	2-809
Figure 2.4-78—{Layer 3 Boundary Conditions}	2-810
Figure 2.4-79—{Layer 4 Boundary Conditions}	2-811
Figure 2.4-80—{South-North Cross-Section}	2-812
Figure 2.4-81—{East-West Cross-Section}	2-813
Figure 2.4-82—{Layer 1 Calibrated Groundwater Elevations}.....	2-814
Figure 2.4-83—{Layer 2 Calibrated Groundwater Elevations}.....	2-815
Figure 2.4-84—{Layer 3 Calibrated Groundwater Elevations}.....	2-816
Figure 2.4-85—{Layer 4 Calibrated Groundwater Elevations}.....	2-817
Figure 2.4-86—{Calibration Graph}	2-818
Figure 2.4-87—{Alluvial Aquifer Pre-Pumping Groundwater Elevations}.....	2-819
Figure 2.4-88—{CJC Aquifer Pre-Pumping Groundwater Elevations}	2-820
Figure 2.4-89—{Alluvial Aquifer Drawdown}	2-821
Figure 2.4-90—{CJC Aquifer Drawdown}	2-822
Figure 2.4-91—{Alluvial Aquifer Groundwater Elevations and Zone Budget Analysis}	2-823
Figure 2.4-92—{Conceptual Groundwater Flow and Transport Pathways}	2-824
Figure 2.5.1-1— {Site Area Topographic Map}	2-950
Figure 2.5.1-2— {Site Topographic Map}	2-951
Figure 2.5.1-3— {Map of Physiographic Provinces}.....	2-952
Figure 2.5.1-4— {Limits of Glaciation}	2-953
Figure 2.5.1-5— {Central Stable Region}.....	2-954
Figure 2.5.1-6— {Missouri Surficial Deposits}	2-955

FSAR List of Figures

Figure 2.5.1-7—	{Regional Domes and Basins}	2-956
Figure 2.5.1-8—	{Precambrian Geologic Provinces}	2-957
Figure 2.5.1-9—	{General Stratigraphic Column of the Region}	2-958
Figure 2.5.1-10—	{Quaternary Class “A” features in the CEUS}	2-959
Figure 2.5.1-11—	{Structural Features and Seismicity of the Central US}	2-960
Figure 2.5.1-12—	{Regional Gravity Anomaly Map}	2-961
Figure 2.5.1-13—	{Regional Magnetic Anomaly Map}	2-962
Figure 2.5.1-14—	{Regional Gravity Anomaly Map with Earthquake Overlays}	2-963
Figure 2.5.1-15—	{Cryptoexplosive Structures}	2-964
Figure 2.5.1-16—	{Tectonic Interpretation by Weston Geophysical Corporation}	2-965
Figure 2.5.1-17—	{Seismic Source Zones Interpretation by Weston Geophysical Corporation}	2-966
Figure 2.5.1-18—	{Tectonic Interpretation by Dames & Moore}	2-967
Figure 2.5.1-19—	{Seismic Source Zones Interpretation by Dames & Moore}	2-968
Figure 2.5.1-20—	{Tectonic Interpretation by Law Engineering Testing Company}	2-969
Figure 2.5.1-21—	{Seismic Source Zones Interpretation by Law Engineering Testing Company}	2-970
Figure 2.5.1-22—	{Tectonic and Seismic Source Zones Interpretation by Woodward-Clyde Consultants}	2-971
Figure 2.5.1-23—	{Tectonic Interpretation by Bechtel Group, Inc.}	2-972
Figure 2.5.1-24—	{Seismic Source Zones Interpretation by Bechtel Group, Inc.}	2-973
Figure 2.5.1-25—	{Tectonic Interpretation by Rondout Associates, Inc.}	2-974
Figure 2.5.1-26—	{Seismic Source Zones Interpretation by Rondout Associates, Inc.}	2-975
Figure 2.5.1-27—	{Springs and Sinkholes of Missouri}	2-976
Figure 2.5.1-28—	{Cave Density of Missouri}	2-977
Figure 2.5.1-29—	{Site Area Geologic Map}	2-978
Figure 2.5.1-30—	{Site Area Soils Map}	2-979
Figure 2.5.1-31—	{Site Area Soils Map Legend}	2-980
Figure 2.5.1-32—	{Site Soils Map}	2-981
Figure 2.5.1-33—	{Depth to Graydon Chert Conglomerate}	2-982
Figure 2.5.1-34—	{Graydon Chert Conglomerate (Elevation of Top Surface)}	2-983
Figure 2.5.1-35—	{Graydon Chert Conglomerate (Thickness)}	2-984
Figure 2.5.1-36—	{Depth to Bottom of Graydon Chert}	2-985
Figure 2.5.1-37—	{Burlington Formation (Thickness)}	2-986
Figure 2.5.1-38—	{Bushberg Formation (Thickness)}	2-987
Figure 2.5.1-39—	{Bushberg Formation (Depth to Top Surface)}	2-988
Figure 2.5.1-40—	{Snyder Creek Formation (Depth to Top Surface)}	2-989
Figure 2.5.1-41—	{Oil and Gas Related Well locations (Oil Wells)}	2-990
Figure 2.5.1-42—	{Mineral Resources in Missouri}	2-995
Figure 2.5.1-43—	{Mineral Industries in Missouri}	2-996
Figure 2.5.2-1—	{Earthquake Catalog and Bechtel Group EPRI Source Zones}	2-1124
Figure 2.5.2-2—	{Earthquake Catalog and Dames & Moore Group EPRI Source Zones}	2-1126
Figure 2.5.2-3—	{Earthquake Catalog and Law Engineering Group EPRI Source Zones}	2-1128
Figure 2.5.2-4—	{Earthquake Catalog and Rondout Group EPRI Source Zones}	2-1130

Figure 2.5.2-5—	{Earthquake Catalog and Weston Group EPRI Source Zones}.....	2-1132
Figure 2.5.2-6—	{Earthquake Catalog and Woodward-Clyde EPRI Source Zones}.....	2-1134
Figure 2.5.2-7—	{Seismic Activity at the New Madrid Fault System}.....	2-1136
Figure 2.5.2-8—	{Logic Tree for the New Madrid Fault System}	2-1137
Figure 2.5.2-9—	{Location of the Arms of the New Madrid Fault System}	2-1138
Figure 2.5.2-10—	{Logic Tree for the Ground Motion Models for General Area Sources}	2-1139
Figure 2.5.2-11—	{Logic Tree for the Ground Motion Models for Non-General Area Sources} .	2-1140
Figure 2.5.2-12—	{Mean and Fractile Rock Hazard Curves }.....	2-1141
Figure 2.5.2-13—	{Mean and Fractile Rock Hazard Curves }.....	2-1142
Figure 2.5.2-14—	{Uniform Hazard Response Spectra for Hard Rock}	2-1143
Figure 2.5.2-15—	{Mean De-aggregation for 1E-4, 1E-5 and 1E-6}	2-1144
Figure 2.5.2-16—	{Comparison of G-R Parameters, Bechtel EST Zones (USGS data through 2001 and 2007)}	2-1145
Figure 2.5.2-17—	{Comparison of UHRS at Hard Rock for Callaway Plant Unit 2 Site (USGS data through 2001 and 2007)}.....	2-1146
Figure 2.5.2-18—	{Sensitivity Analysis of Postulated Events Near St. Louis}.....	2-1147
Figure 2.5.2-19—	{Best Estimate of Shear Wave Velocity at the Callaway Plant Unit 2 Site}	2-1148
Figure 2.5.2-20—	{Randomization of Low Strain Shear Wave Velocity Profiles}	2-1149
Figure 2.5.2-21—	{Mean +/- Standard deviation for Shear Wave Velocity}.....	2-1150
Figure 2.5.2-22—	{Strain Dependent Properties and Randomization for Graydon Chert Conglomerate}	2-1151
Figure 2.5.2-23—	{Smooth Uniform Response Spectra for Hard Rock}	2-1152
Figure 2.5.2-24—	{Smooth Reference Spectra for Hard Rock Conditions}.....	2-1153
Figure 2.5.2-25—	{Response Spectra for Controlling Events at the Callaway Plant Unit 2 Site}.....	2-1154
Figure 2.5.2-26—	{Response Spectra of Selected Time Histories for 1E-4 Controlling Event LF, DEL and DEH after Spectral Matching}	2-1155
Figure 2.5.2-27—	{Mean Site Amplification Factors and Coefficient of variation at 37.5 ft (11.4 m) Depth for 1E-4, 1E-5, LF and HF. DEM Input Motion}	2-1156
Figure 2.5.2-28—	{Maximum Strains Vs. Depth for 1E-4, 1E-5, LF and HF. DEM Input Motion} .	2-1157
Figure 2.5.2-29—	{HF and LF Spectra and Envelopes for 1E-4 and 1E-5}	2-1158
Figure 2.5.2-30—	{Recommended Horizontal and Vertical SSE Spectra}.....	2-1159
Figure 2.5.2-31—	{Recommended V/H Ratios}	2-1160
Figure 2.5.4-1—	{Generic Soil Profile}	2-1267
Figure 2.5.4-2—	{Boring Layout Plan}	2-1268
Figure 2.5.4-3—	{Geophysical Exploration Locations}	2-1269
Figure 2.5.4-4—	{Surface Elevation Contours}	2-1270
Figure 2.5.4-5—	{Depth to Graydon Chert Conglomerate}	2-1271
Figure 2.5.4-6—	{Graydon Chert Conglomerate (Elevation of Top Surface)}	2-1272
Figure 2.5.4-7—	{Graydon Chert Conglomerate (Thickness)}	2-1273
Figure 2.5.4-8—	{Depth to Bottom of Graydon Chert Conglomerate}.....	2-1274
Figure 2.5.4-9—	{Burlington Formation (Thickness)}	2-1275
Figure 2.5.4-10—	{Bushberg Formation (Depth to Top Surface)}.....	2-1276
Figure 2.5.4-11—	{Bushberg Formation (Thickness)}	2-1277

Figure 2.5.4-12—	{Snyder Creek Formation (Depth to Top Surface)}	2-1278
Figure 2.5.4-13—	{SPT Variability}	2-1279
Figure 2.5.4-14—	{Pressuremeter Test Results}	2-1280
Figure 2.5.4-15—	{Pressuremeter Test Results}	2-1281
Figure 2.5.4-16—	{Geophysical Testing (Cross-Hole)}	2-1282
Figure 2.5.4-17—	{Geophysical Testing at CH-2}	2-1283
Figure 2.5.4-18—	{Geophysical Testing at R1}	2-1284
Figure 2.5.4-19—	{Geophysical Testing at R1-B}	2-1285
Figure 2.5.4-20—	{Geophysical Testing at R-25}	2-1286
Figure 2.5.4-21—	{Geophysical Testing at R-28}	2-1287
Figure 2.5.4-22—	{Reflection Survey (1 of 3)}	2-1288
Figure 2.5.4-23—	{Reflection Survey (2 of 3)}	2-1289
Figure 2.5.4-24—	{Reflection Survey (3 of 3)}	2-1290
Figure 2.5.4-25—	{Atterberg Limits and Moisture Content}	2-1291
Figure 2.5.4-26—	{Casagrande Plasticity Chart}	2-1292
Figure 2.5.4-27—	{Resonant Column Test, UTA-56-A (1E) Loess / Acretion Gley}	2-1293
Figure 2.5.4-28—	{Resonant Column Test, UTA-56-B (2C) Glacial Till}	2-1294
Figure 2.5.4-29—	{Resonant Column Test, UTA-56-C (3C) Graydon Chert Conglomerate}	2-1295
Figure 2.5.4-30—	{Resonant Column Test, UTA-56-D (4C) Graydon Chert Conglomerate (FWC)}	2-1296
Figure 2.5.4-31—	{Resonant Column Test, UTA-56-E (5C) Graydon Chert Conglomerate (CB)}	2-1297
Figure 2.5.4-32—	{Resonant Column Test, UTA-56-B (2G) Glacial Till}	2-1298
Figure 2.5.4-33—	{Seismic Wave Velocity Profiles Soil Velocity Profile}	2-1299
Figure 2.5.4-34—	{Strain Dependent Properties for the Overburden Soils}	2-1300
Figure 2.5.4-35—	{Recommended Strain Dependent Properties for the Graydon Chert Conglomerate}	2-1301
Figure 2.5.4-36—	{Foundation Interface Profiles}	2-1302
Figure 2.5.4-37—	{Foundation Interface Cross Section 1-1'}	2-1303
Figure 2.5.4-38—	{Foundation Interface Cross Section 2-2'}	2-1304
Figure 2.5.4-39—	{Foundation Interface Cross Section 3-3'}	2-1305
Figure 2.5.4-40—	{Foundation Interface Cross Section 4-4'}	2-1306
Figure 2.5.4-41—	{Excavation Plan}	2-1307
Figure 2.5.4-42—	{Excavation Cross Sections}	2-1308
Figure 2.5.4-43—	{Liquefaction Potential}	2-1309
Figure 2.5.4-44—	{NI Settlement Analysis Service Loads}	2-1310
Figure 2.5.4-45—	{NI Settlement Analysis East West Section}	2-1311
Figure 2.5.4-46—	{NI Settlement Analysis North South Section}	2-1312
Figure 2.5.4-47—	{Examples of Earth Pressure Diagrams}	2-1313
Figure 2.5.5-1—	{Site Topographic Map 5 Mile (8 km) Radius}	2-1324
Figure 2.5.5-2—	{Site Area Topographic Map 0.6 Mile (1 km) Radius}	2-1325
Figure 2.5.5-3—	{Generic Soil Profile}	2-1326
Figure 2.5.5-4—	{Excavation Cross Sections}	2-1327

Figure 2.5.5-5—	{Permanent Slope Cross Sections and Failure Surfaces}	2-1328
Figure 2.5.5-6—	{Temporary Slope Cross Sections and Failure Surfaces}	2-1330
Figure 2.5.5-7—	{ESWEMS Pond Plan View}.....	2-1331
Figure 2.5L-1—	{Site Region Relief Map}	2-1332
Figure 2.5L-2—	{Site Vicinity Topographic Map}.....	2-1333
Figure 2.5L-3—	{Site Map With Existing Callaway Plant Unit 1 and Proposed Callaway Plant Unit 2 Buildings}	2-1334
Figure 2.5L-4—	{Regional Geologic Map}	2-1335
Figure 2.5L-5—	{Regional Faulting and Earthquake Epicenters}.....	2-1336
Figure 2.5L-6—	{Regional Folding}	2-1337
Figure 2.5L-7—	{Regional Loess Isopach Map}	2-1338
Figure 2.5L-8—	{Site Vicinity Geologic Map}	2-1339
Figure 2.5L-9—	{Site Area Geologic Cross Sections}	2-1340
Figure 2.5L-10—	{Site Geologic Cross Section}	2-1341
Figure 2.5L-11—	{Site Grading Plan}	2-1346
Figure 2.5L-12—	{S-Wave Reflection Survey Interpretation}.....	2-1347
Figure 2.5L-13—	{Site Stratigraphic Column}.....	2-1348
Figure 2.5L-14—	{Location of Undisturbed Samples}	2-1349
Figure 2.5L-15—	{Location of Special Care Samples}	2-1350

3.0 Design of Structures, Components, Equipment and Systems

Figure 3.7-1—	{Comparison of EPR (Standard Plant) and Callaway Plant Unit 2 Ground Design Spectra Horizontal Direction, 5% Damping}	3-49
Figure 3.7-2—	{Comparison of EPR (Standard Plant) and Callaway Plant Unit 2 Ground Design Spectra Vertical Direction, 5% Damping}	3-50
Figure 3.7-3—	{Comparison of EPR (Standard Plant) and Callaway Plant Unit 2 Ground Design Spectra Horizontal Direction, Low Frequencies, 5% Damping}.....	3-51
Figure 3.7-4—	{Comparison of EPR (Standard Plant) and Callaway Plant Unit 2 Ground Design Spectra Vertical Direction, Low Frequencies, 5% Damping}	3-52
Figure 3.7-5—	{Comparison of EPGB FIRS (Callaway Plant Unit 2) and CSDRS Horizontal Direction, 5% Damping}.....	3-53
Figure 3.7-6—	{Comparison of EPGB FIRS (Callaway Plant Unit 2) and CSDRS Vertical Direction, 5% Damping}	3-54
Figure 3.7-7—	{Comparison of ESWB FIRS (Callaway Plant Unit 2) and CSDRS Horizontal Direction, 5% Damping}.....	3-55
Figure 3.7-8—	{Comparison of ESWB FIRS (Callaway Plant Unit 2) and CSDRS Vertical Direction, 5% Damping}.....	3-56
Figure 3.7-9—	{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of NI Basemat, X(E-W) Direction, 5% Damping}.....	3-57
Figure 3.7-10—	{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of NI Basemat, Y(N-S) Direction, 5% Damping}.....	3-58

FSAR List of Figures

Figure 3.7-11—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of NI Basemat, Z(Vertical) Direction, 5% Damping}.....	3-59
Figure 3.7-12—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of EPGB 1&2 Basemat, X(E-W) Direction, 5% Damping}	3-60
Figure 3.7-13—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of EPGB 1&2 Basemat, Y(N-S) Direction, 5% Damping}	3-61
Figure 3.7-14—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of EPGB 1&2 Basemat, Z(Vertical) Direction, 5% Damping}.....	3-62
Figure 3.7-15—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of EPGB 3&4 Basemat, X(E-W) Direction, 5% Damping}	3-63
Figure 3.7-16—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of EPGB 3&4 Basemat, Y(N-S) Direction, 5% Damping}	3-64
Figure 3.7-17—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of EPGB 3&4 Basemat, Z(Vertical) Direction, 5% Damping}.....	3-65
Figure 3.7-18—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of ESWB 1 Basemat, X(E-W) Direction, 5% Damping}	3-66
Figure 3.7-19—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of ESWB 1 Basemat, Y(N-S) Direction, 5% Damping}	3-67
Figure 3.7-20—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of ESWB 1 Basemat, Z(Vertical) Direction, 5% Damping}.....	3-68
Figure 3.7-21—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of ESWB 2 Basemat, X(E-W) Direction, 5% Damping}	3-69
Figure 3.7-22—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of ESWB 2 Basemat, Y(N-S) Direction, 5% Damping}	3-70
Figure 3.7-23—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of ESWB 2 Basemat, Z(Vertical) Direction, 5% Damping}.....	3-71
Figure 3.7-24—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of ESWB 3 Basemat, X(E-W) Direction, 5% Damping}	3-72
Figure 3.7-25—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of ESWB 3 Basemat, Y(N-S) Direction, 5% Damping}	3-73
Figure 3.7-26—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of ESWB 3 Basemat, Z(Vertical) Direction, 5% Damping}.....	3-74

Figure 3.7-27—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of ESWB 4 Basemat, X(E-W) Direction, 5% Damping}	3-75
Figure 3.7-28—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of ESWB 4 Basemat, Y(N-S) Direction, 5% Damping}	3-76
Figure 3.7-29—{Comparison of Callaway Plant Unit 2 versus US EPR Standard In-structure Response Spectra, Center of ESWB 4 Basemat, Z(Vertical) Direction, 5% Damping}.	3-77
Figure 3.7-30—{Isometric View of FEM for EPGB}	3-78
Figure 3.7-31—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Reactor Building Internals, Elev. 5.15m, ±15% Peak-Broadened, X(E-W) Direction, 5% Damping}.	3-79
Figure 3.7-32—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Reactor Building Internals, Elev. 5.15m, ±15% Peak-Broadened, Y(N-S) Direction, 5% Damping}	3-80
Figure 3.7-33—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Reactor Building Internals, Elev. 5.15m, ±15% Peak-Broadened, Z(Vertical) Direction, 5% Damping}	3-81
Figure 3.7-34—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Reactor Building Internals, Elev. 19.50m, ±15% Peak-Broadened, X(E-W) Direction, 5% Damping}.	3-82
Figure 3.7-35—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Reactor Building Internals, Elev. 19.50m, ±15% Peak-Broadened, Y(N-S) Direction, 5% Damping}	3-83
Figure 3.7-36—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Reactor Building Internals, Elev. 19.50m, ±15% Peak-Broadened, Z(Vertical) Direction, 5% Damping}	3-84
Figure 3.7-37—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Safeguard Building 1, 8.1m, ±15% Peak-Broadened, X(E-W) Direction, 5% Damping}	3-85
Figure 3.7-38—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Safeguard Building 1, 8.1m, ±15% Peak-Broadened, Y(N-S) Direction, 5% Damping}	3-86
Figure 3.7-39—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Safeguard Building 1, 8.1m, ±15% Peak-Broadened, Z(Vertical) Direction, 5% Damping}	3-87
Figure 3.7-40—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Safeguard Building 1, 21.0m, ±15% Peak-Broadened, X(E-W) Direction, 5% Damping}	3-88
Figure 3.7-41—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Safeguard Building 1, 21.0m, ±15% Peak-Broadened, Y(N-S) Direction, 5% Damping}	3-89
Figure 3.7-42—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Safeguard Building 1, 21.0m, ±15% Peak-Broadened, Z(Vertical) Direction, 5% Damping}	3-90
Figure 3.7-43—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Safeguard Building 2/3, 8.1m, ±15% Peak-Broadened, X(E-W) Direction, 5% Damping}	3-91

Figure 3.7-44—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Safeguard Building 2/3, 8.1m, ±15% Peak-Broadened, Y(N-S) Direction, 5% Damping}	3-92
Figure 3.7-45—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Safeguard Building 2/3, 8.1m, ±15% Peak-Broadened, Z(Vertical) Direction, 5% Damping}	3-93
Figure 3.7-46—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Safeguard Building 2/3, 15.4m, ±15% Peak-Broadened, X(E-W) Direction, 5% Damping}	3-94
Figure 3.7-47—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Safeguard Building 2/3, 15.4m, ±15% Peak-Broadened, Y(N-S) Direction, 5% Damping}	3-95
Figure 3.7-48—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Safeguard Building 2/3, 15.4m, ±15% Peak-Broadened, Z(Vertical) Direction, 5% Damping}	3-96
Figure 3.7-49—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Safeguard Building 4, 21.0m, ±15% Peak-Broadened, X(E-W) Direction, 5% Damping}	3-97
Figure 3.7-50—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Safeguard Building 4, 21.0m, ±15% Peak-Broadened, Y(N-S) Direction, 5% Damping}	3-98
Figure 3.7-51—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Safeguard Building 4, 21.0m, ±15% Peak-Broadened, Z(Vertical) Direction, 5% Damping}	3-99
Figure 3.7-52—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Containment Building, Elev. 37.60m, ±15% Peak-Broadened, X(E-W) Direction, 5% Damping}.	3-100
Figure 3.7-53—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Containment Building, Elev. 37.60m, ±15% Peak-Broadened, Y(N-S) Direction, 5% Damping}	3-101
Figure 3.7-54—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Containment Building, Elev. 37.60m, ±15% Peak-Broadened, Z(Vertical) Direction, 5% Damping}	3-102
Figure 3.7-55—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Containment Building, Elev. 58.00m, ±15% Peak-Broadened, X(E-W) Direction, 5% Damping}.	3-103
Figure 3.7-56—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Containment Building, Elev. 58.00m, ±15% Peak-Broadened, Y(N-S) Direction, 5% Damping}	3-104
Figure 3.7-57—{Comparison of Callaway Plant Unit 2 (bold, dark blue) versus US EPR Standard In-structure Response Spectra, Containment Building, Elev. 58.00m, ±15% Peak-Broadened, Z(Vertical) Direction, 5% Damping}	3-105
Figure 3.7-58—{Callaway EPGB, Elev. 0.0m, X(E-W) Direction, 5% Damping}	3-106
Figure 3.7-59—{Callaway EPGB, Elev. 0.0m, Y(N-S) Direction, 5% Damping}	3-107
Figure 3.7-60—{Callaway EPGB, Elev. 0.0m, Z(Vertical) Direction, 5% Damping}	3-108
Figure 3.7-61—{Callaway ESWB, Elev. 19.20m, X(E-W) Direction, 5% Damping}	3-109
Figure 3.7-62—{Callaway ESWB, Elev. 19.20m, Y(N-S) Direction, 5% Damping}	3-110
Figure 3.7-63—{Callaway ESWB, Elev. 19.20m, Z(Vertical) Direction, 5% Damping}	3-111

FSAR List of Figures

Figure 3.7-64—{Callaway ESWB, Elev. 4.27m, X(E-W) Direction, 5% Damping}	3-112
Figure 3.7-65—{Callaway ESWB, Elev. 4.27m, Y(N-S) Direction, 5% Damping}	3-113
Figure 3.7-66—{Callaway ESWB, Elev. 4.27m, Z(Vertical) Direction, 5% Damping}	3-114
Figure 3.7-67—{US EPR Callaway Plant Unit 2 In-structure Response Spectra, Reactor Building Internals, Elev. 5.15m, ±15% Peak-Broadened, Z(Vertical) Direction, 2%, 3%, 4%, 5%, 7%, and 10% Damping}.....	3-115
Figure 3.7-68—{Callaway Spectrum Envelope of EPGB, Elev. 0.0m, X(E-W) Direction, 2%, 3%, 4%, 5%, 7%, and 10% Damping}	3-116
Figure 3.7-69—{Callaway Spectrum Envelope of EPGB, Elev. 0.0m, Y(N-S) Direction, 2%, 3%, 4%, 5%, 7%, and 10% Damping}	3-117
Figure 3.7-70—{Callaway Spectrum Envelope of EPGB, Elev. 0.0m, Z(Vertical) Direction, 2%, 3%, 4%, 5%, 7%, and 10% Damping}	3-118
Figure 3.7-71—{Callaway Spectrum Envelope of ESWB, Elev. 19.20m, X(E-W) Direction, 2%, 3%, 4%, 5%, 7%, and 10% Damping}	3-119
Figure 3.7-72—{Callaway Spectrum Envelope of ESWB, Elev. 19.20m, Y(N-S) Direction, 2%, 3%, 4%, 5%, 7%, and 10% Damping}	3-120
Figure 3.7-73—{Callaway Spectrum Envelope of ESWB, Elev. 19.20m, Z(Vertical) Direction, 2%, 3%, 4%, 5%, 7%, and 10% Damping}	3-121
Figure 3.7-74—{Callaway Spectrum Envelope of ESWB, Elev. 4.27m, X(E-W) Direction, 2%, 3%, 4%, 5%, 7%, and 10% Damping}	3-122
Figure 3.7-75—{Callaway Spectrum Envelope of ESWB, Elev. 4.27m, Y(N-S) Direction, 2%, 3%, 4%, 5%, 7%, and 10% Damping}	3-123
Figure 3.7-76—{Comparison of Callaway Plant Unit 2 GMRS and CSDRS at 0.1g PGA (Horizontal)}	3-124
Figure 3.7-77—{FIRS at ESWEMS Pump House Foundation Level}	3-125
Figure 3.7-78—{North-South Time Histories Matching ESWEMS Foundation Level FIRS}	3-126
Figure 3.7-79—{East-West Time Histories Matching ESWEMS Foundation Level FIRS}	3-127
Figure 3.7-80—{Vertical Time Histories Matching ESWEMS Foundation Level FIRS}	3-128
Figure 3.7-81—{Callaway Plant Unit 2 North-South FIRS at Elev. 835ft}	3-129
Figure 3.7-82—{Callaway Plant Unit 2 East-West FIRS at Elev. 835ft}	3-130
Figure 3.7-83—{Callaway Plant Unit 2 Vertical FIRS at Elev. 835ft}	3-131
Figure 3.7-84—{Callaway Plant Unit 2 Strain-Compatible Site Profile}	3-132
Figure 3.7-85—{Callaway Plant Unit 2 Vs EPR DC Soil Cases}	3-133
Figure 3.7-86—{Callaway Plant Unit 2 Vs EPR DC Soil Cases}	3-134
Figure 3.7-87—{Response Spectra at NI Common Basemat Bottom Node 417 - 5% Damping X-Direction}.....	3-135
Figure 3.7-88—{Response Spectra at NI Common Basemat Bottom Node 417 - 5% Damping Y-Direction}.....	3-136
Figure 3.7-89—{Response Spectra at NI Common Basemat Bottom Node 417 - 5% Damping Z-Direction}.....	3-137
Figure 3.7-90—{Soil Model Surface Response Spectra at Centers of Footprints of EPGB & ESWB - 5% Damping X-Direction}.....	3-138
Figure 3.7-91—{Soil Model Surface Response Spectra at Centers of Footprints of EPGB & ESWB - 5% Damping Y-Direction}	3-139
Figure 3.7-92—{Soil Model Surface Response Spectra at Centers of Footprints of EPGB & ESWB - 5% Damping Z-Direction}.....	3-140

FSAR List of Figures

Figure 3.7-93—{Horizontal Spectrum for Response Spectrum Analysis}	3-141
Figure 3.7-94— {Vertical Spectrum for Response Spectrum Analysis}	3-142
Figure 3.7-95—{ESWEMS Pumphouse Horizontal Response Spectrum with 5% Damping}	3-143
Figure 3.7-96—{ESWEMS Pumphouse Vertical Response Spectrum with 5% Damping}	3-144
Figure 3.7-97—{Legend of Joints/Nodes in ESWEMS Pumphouse at Locations of High Demand Stresses}.....	3-145
Figure 3.7-98—{Legend of Internal Joints/Nodes at Locations of High Demand Stress}	3-146
Figure 3.7-99—{Finite Element Model of ESWEMS Pump House}.....	3-147
Figure 3.7-100—{Assumed Shear Wave Velocities in Structural Fill Under ESWEMS Pump House}.....	3-148
Figure 3.7-101—{Strain Compatible Shear Wave Velocities in Subgrade Profile Used in SSI Analysis}	3-149
Figure 3.7-102—{In-structure Floor Response Spectra in E-W Direction at First Floor Level of the ESWEMS Pump House}.....	3-150
Figure 3.7-103—In-structure Floor Response Spectra in N-S Direction at First Floor Level of the ESWEMS Pump House}.....	3-151
Figure 3.7-104—{In-structure Floor Response Spectra in Vertical Direction at First Floor Level of the ESWEMS Pump House}	3-152
Figure 3.7-105—{In-structure Floor Response Spectra in E-W Direction at Mezzanine Level of the ESWEMS Pump House}.....	3-153
Figure 3.7-106—{In-Structure Floor Response Spectra in N-S Direction at Mezzanine Level of the ESWEMS Pump House}.....	3-154
Figure 3.7-107—{In-structure Floor Response Spectra in Vertical Direction at Mezzanine Level of the ESWEMS Pump House}	3-155
Figure 3.7-108—{In-structure Floor Response Spectra in E-W Direction at Roof Level of the ESWEMS Pump House}	3-156
Figure 3.7-109—{In-structure Floor Response Spectra in N-S Direction at Roof Level of the ESWEMS Pump House}	3-157
Figure 3.7-110—{In-structure Floor Response Spectra in Vertical Direction at Roof Level of the ESWEMS Pump House}.....	3-158
Figure 3.7-111—{Spectrum Envelope of ESWB Elev. 4.27 m, Z(Vert) Direction, 2%, 3%, 4%, 5%, 7%, and 10% Damping}.....	3-159
Figure 3.8-1— {Schematic Site Plan of Seismic Category I Buried Utilities at the NI (Electrical Duct Banks)}	3-178
Figure 3.8-2— {Schematic Site Plan of Seismic Category I Buried Utilities at the NI (Underground Piping)}.....	3-179
Figure 3.8-3— {Isometric View of the GTStrudl Finite Element Model for the ESWEMS Pumphouse Structure (Partial View of Basemat, Exterior Walls and Interior Divider Walls)}... ..	3-180
Figure 3.8-4— {Isometric View of the GTStrudl Finite Element Model for the ESWEMS Pumphouse Structure (Partial View of Pump Wells, Wing Walls and Apron)}	3-181
Figure 3E.4-1—{Isometric View of ESWEMS Pumphouse Main Basemat & Pump Well Base - Finite Element Mesh}.....	3-228
Figure 3E.4-2—{Isometric View of the ESWEMS Pumphouse GTStrudl Finite Element Model-Exterior Wall, Roof, and Apron}	3-229
Figure 3E.4-3—{GT Strudl Finite Element Planar Reference System}	3-230
Figure 3E.4-4—{Plant Arrangement - ESWEMS Pumphouse Excavation Cut and Backfill}	3-231

Figure 3E.4-5—{Plant Arrangement - ESWEMS Pond and Pumphouse Location Plan}	3-232
Figure 3E.4-6—{Plant Arrangement - ESWEMS Pond Typical Riprap Detail}	3-233
Figure 3E.4-7—{Plant Arrangement - ESWEMS Pond Spillway Plan}	3-234
Figure 3E.4-8—{Plant Arrangement - ESWEMS Pond Spillway Section}	3-235
Figure 3E.4-9—{Plant Arrangement - ESWEMS Pond Section at Embankment}	3-236
Figure 3E.4-10—{Plant Arrangement - ESWEMS Pond Section at Embankment}	3-237
Figure 3E.4-11—{Plant Arrangement - ESWEMS Pond Section at Embankment}	3-238
Figure 3E.4-12—{Plant Arrangement - ESWEMS Pumphouse Rebar}	3-239

4.0 Reactor

5.0 Reactor Coolant System and Connected Systems

6.0 Engineered Safety Features

7.0 Instrumentation and Controls

8.0 Electric Power

Figure 8.1-1— {Callaway Plant 345 kV Circuit Corridors}	8-7
Figure 8.2-1— {Callaway Plant Layout}	8-23
Figure 8.2-2— {Callaway Switchyard Single Line Diagram}	8-24
Figure 8.3-1— {Emergency Power Supply System Single Line Drawing - Sheet 1 of 3}	8-31
Figure 8.3-2— {Emergency Power Supply System Single Line Drawing - Sheet 2 of 3}	8-32
Figure 8.3-3— {Emergency Power Supply System Single Line Drawing - Sheet 3 of 3}	8-33
Figure 8.3-4— {Normal Power Supply System Single Line Drawing - Sheet 1 of 4}	8-34
Figure 8.3-5— {Normal Power Supply System Single Line Drawing - Sheet 2 of 4}	8-35
Figure 8.3-6— {Normal Power Supply System Single Line Drawing - Sheet 3 of 4}	8-36
Figure 8.3-7— {Normal Power Supply System Single Line Drawing - Sheet 4 of 4}	8-37
Figure 8.3-8— {Callaway Site Grounding}	8-38

9.0 Auxiliary Systems

Figure 9.2-1— {Potable Water System}	9-22
Figure 9.2-2— {Sanitary Waste Water System}	9-23
Figure 9.2-3— {Essential Service Water Emergency Makeup System}	9-24
Figure 9.2-4— {Schematic of Raw Water/Treated Water Supply}	9-25
Figure 9.2-5— {Collector Well River Intake System}	9-26
Figure 9.2-6— {Collector Well River Intake System Pump Structure-Plan View}	9-27
Figure 9.2-7— {Collector Well River Intake System Pump Structure - Section View}	9-28
Figure 9.2-8— {Plant Arrangement - ESWEMS Pumphouse Floor Plan}	9-29

Figure 9.2-9— {Plant Arrangement - ESWEMS Pumphouse Section}	9-30
Figure 9.2-10—{Plant Arrangement - ESWEMS Pumphouse Section}	9-31
Figure 9.2-11—{Plant Arrangement - ESWEMS Pumphouse Section}	9-32
Figure 9.2-12—{Plant Arrangement - ESWEMS Pumphouse Pump Well Plan}	9-33
Figure 9.2-13—{Plant Arrangement - ESWEMS Pumphouse Mezzanine Plan}	9-34
Figure 9.2-14—{Plant Arrangement - ESWEMS Pumphouse Roof Plant}	9-35
Figure 9.4-1— {ESWEMS Pumphouse Ventilation System}.....	9-42
Figure 9.5-1—]Fire Protection Organization}	9-58

9B Fire Protection Analysis - Plant Specific Supplement

Figure 9B-1— {Callaway Plant Unit 2 Fire Barrier Location, Turbine Building Plan at Elevation (-)23 Feet}	9B-32
Figure 9B-2— {Callaway Plant Unit 2 Fire Barrier Location, Turbine Building Plan at Elevation +/- 0 Feet}.	9B-33
Figure 9B-3— {Callaway Plant Unit 2 Fire Barrier Location, Turbine Building Plan at Elevation +38 Feet}	9B-34
Figure 9B-4— {Callaway Plant Unit 2 Fire Barrier Location, Turbine Building Plan at Elevation +65 Feet}	9B-35
Figure 9B-5— {Callaway Plant Unit 2 Fire Barrier Location, Turbine Building Plan at Elevation (-)43 Feet}	9B-36
Figure 9B-6— {Callaway Plant Unit 2 Fire Barrier Location, Turbine Building Roof Plan}.....	9B-37
Figure 9B-7— {Callaway Plant Unit 2 Fire Barrier Location, Turbine Building Section A-A}	9B-38
Figure 9B-8— {Callaway Plant Unit 2 Fire Barrier Location, Turbine Building Section B-B}.....	9B-39
Figure 9B-9— {Callaway Plant Unit 2 Fire Barrier Location, Turbine Building Section C-C}	9B-40
Figure 9B-10— {Callaway Unit 2 Fire Barrier Location, SWGR/SBO Buildings Plan View at Elevation (-)13'-0"}	9B-41
Figure 9B-11— {Callaway Unit 2 Fire Barrier Location, SWGR/SBO/AUX BLR Buildings Plan View at Elevation 0'-0"}	9B-42
Figure 9B-12— {Callaway Unit 2 Fire Barrier Location, SWGR/SBO/AUX BLR Buildings Plan View at Elevation 13'-0"}	9B-43
Figure 9B-13— {Callaway Unit 2 Fire Barrier Location, SWGR/SBO/AUX BLR Buildings Plan View at Elevation 24'-6"}	9B-44
Figure 9B-14— {Callaway Unit 2 Fire Barrier Location, SWGR/SBO/AUX BLR Buildings, Plan View Section A-A}.....	9B-45
Figure 9B-15— {Callaway Unit 2 Fire Barrier Location, Transformer Area Plan View at Elevation 0'-0"}.....	9B-46
Figure 9B-16— {Callaway Unit 2 Fire Barrier Location, Security Access Facility Plan View}.....	9B-47
Figure 9B-17— {Callaway Unit 2 Fire Barrier Location, Central Gas Supply Building Plan View} ..	9B-48
Figure 9B-18— {Callaway Unit 2 Fire Barrier Location, Switchyard Control House Plan View}....	9B-49
Figure 9B-19— {Callaway Unit 2 Fire Barrier Location, Fire Protection Building Plan View}	9B-50
Figure 9B-20— {Callaway Unit 2 Fire Barrier Location, Circulating Water Pump Building, Plan View and Section A-A (Typical)}	9B-51
Figure 9B-21— {Callaway Unit 2 Fire Barrier Location, ESWEMS Pumphouse, Fire Protection Layout}	9B-52

10.0 Steam and Power Conversion System

Figure 10.4-1—{Circulating Water System P & ID (Circulating Water Pump Building)} 10-14
 Figure 10.4-2—{Circulating Water System P & ID (Turbine Building)} 10-15
 Figure 10.4-3—{Circulating Water System Pump Intake Structure (Plan View)} 10-16
 Figure 10.4-4—{Circulating Water System Pump Intake Structure (Section View)} 10-17
 Figure 10.4-5—{Circulating Water System P & ID Cooling Towers} 10-18
 Figure 10.4-6—{Circulating Water System P & ID Blowdown Flowpath} 10-19
 Figure 10.4-7—{Circulating Water System Plant Discharge} 10-20

11.0 Radioactive Waste Management

12.0 Radiation Protection

Figure 12.3-1—{Site Layout of Callaway Plant Unit 2} 12-18

13.0 Conduct of Operations

Figure 13.1-1—{Organization Chart} 13-21

14.0 Verification Programs

15.0 Transient and Accident Analysis

16.0 Technical Specifications

17.0 Quality Assurance and Reliability Assurance

18.0 Human Factors Engineering

19.0 Probabilistic Risk Assessment and Severe Accident Evaluation